

Comments received during the external review of the first order draft of the sustainable use of wild species thematic assessment.  
The review period was from Monday 26 August to Sunday 20 October 2019

Nb	Reviewer Name (Last, First)	Chapter	From Page (start)	From Line (start)	To Page (end)	To Line (end)	Comments	Response from experts of the chapter
1	Adeline Lerambert	4	0	0	0	0	In many places in this chapter (and throughout the document) the term 'sustainable use' is used when discussing factors which influence the sustainability of use. 'Sustainable use' should only be used in reference to uses which have been demonstrated to meet whatever criteria have been established for assessing sustainability. It cannot be assumed that IPLC use of wildlife is, by default, 'sustainable'. Therefore suggest the term 'sustainability of use' be used when discussing factors which influence sustainability.	Thank you for your comment. This assessment defines "sustainable use" as emerging from social-ecological systems that meet human needs without compromising ecosystem health. Sustainable use is not limited to anthropocentric considerations (i.e. the sustainability of the use for the benefit of people) or to ecological/environmental considerations (i.e. the conservation of the target resource in an ecosystemic perspective), but it encompasses both social and ecological considerations as well as the multiple aspects of their interactions (see Chapter 1, the definition is explored further in section 1.3.2).
2	Doering, Ralf	4	0	0	0	0	In the following comments I will list a few comments regarding marine ecosystems, fisheries, fisheries governance etc. I think the chapter would benefit from an author with knowledge about fisheries management, drivers of change in aquatic ecosystems, institutions in fisheries management, etc.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
3	Freyer, Daniela	4	0	0	0	0	General comment: Important knock on effects of the wildlife trade on biodiversity are currently not covered in this section, including the high potential of the wildlife trade to introduce invasive species and spread pathogens that may have devastating effects on wildlife (as well as humans and livestock). Recent examples of pathogens likely introduced through the pet trade and with devastating effects on amphibians worldwide are the Chytrid fungi BSA1 and Bd. Some suggested references: • WCS (2016): Overview of health threats associated with international commercial trade in CITES-listed species. CITES SC69 Inf. 13. • Travis et al. (2011): The spread of pathogens through trade in wildlife. Rev. sci. tech. Off. int. Epiz. 30 (1), 219-239 • YUAN, Z.; MARTEL, A.; WU, J.; VAN PRAET, S.; CANESSA, S. & F. Pasmans (2018): Widespread occurrence of an emerging fungal pathogen in heavily traded Chinese urodelean species. Conservation Letters DOI: 10.1111/conl.12436. 8 S. • SPITZEN-VAN DER SLUJUS, A.; MARTEL, A.; WOMBWELL, E.; VAN ROOIJ, P.; ZOLLINGER, R. et al. (2011): Clinically healthy amphibians in captive collections and at pet fairs: A reservoir of Batrachochytrium dendrobatidis. Amphibia-Reptilia 32: 419-423. • FITZPATRICK, L.D.; PASMANS, F.; MARTEL, A. & A.A. CUNNINGHAM (2018): Epidemiological tracing of Batrachochytrium salamandrorans identifies widespread infection and associated mortalities in private amphibian collection. Nature 8: Article 13845. 10.1038/s41598-018-31800-z. • LOETTERS, S.; WAGNER, N.J.; KERRES, A.; VENDES, M.; STEINFARTZ, S. et al. (2018): First report of host co-infection of parasitic amphibian chytrid fungi. Salamandra 54(4): 287-290. • MARTEL, A.; BLOOI, M.; ADRIAENSEN, C.; VAN ROOIJ, P.; BEUKEMA, W. et al. (2014): Recent introduction of a chytrid fungus endangers Western Palearctic salamanders. Science 346(6209): 630-631.	The trade subsection now also looks at invasive species, and we have included the suggested references, but generally that section is on drivers of sustainable use. Invasive species are covered in the environmental drivers section; but also see global assessment.
4	Freyer, Daniela	4	0	0	0	0	General comment: The draft currently lacks an assessment of the sustainability of the trade in wildlife as pets. Various reports document the often unsustainable nature of this trade (which includes many species that are threatened according to IUCN, and for which trade is recognized to be a major threat) and additional negative effects through destructive collection methods on habitats. The fact that at the last Conferences of the Parties to CITES a significant number of species threatened by the pet trade has been included in the CITES Appendices, respectively that the protection status of already listed species was increased in order to ban trade, provides further evidence that the wildlife trade for pets is often unsustainable. (see <a href="https://www.cites.org/eng/CITES_conference_responds_to_extinction_crisis_by_strengthening_international_trade_regime_for_wildlife_28082019">https://www.cites.org/eng/CITES_conference_responds_to_extinction_crisis_by_strengthening_international_trade_regime_for_wildlife_28082019</a> "Because the growing exotic pet trade has put enormous pressure on many species of turtle, lizard and gecko, CITES added a range of these species to the Appendices.") Suggestions for references on the impact of exploitation of wildlife trade (generally) and the pet trade more specifically: • DI MININ, E.; BROOKS, T.M.; TOIVONEN, T.; BUTCHART, S.H.; HEIKINHEIMO, V. et al. (2019b): Identifying global centers of unsustainable commercial harvesting of species. Sci. Adv. 2019; 5: eaau2879. • ALLAN, J.R.; WATSON, J.E.; DI MARCO, M.; O'BRYAN, C.J.; POSSINGHAM, H.P. et al. (2019): Hotspots of human impact on threatened terrestrial vertebrates. PLoS Biol. 17(3): e3000158. <a href="https://doi.org/10.1371/journal.pbio.3000158">https://doi.org/10.1371/journal.pbio.3000158</a> • MAXWELL, S.L.; FULLER, R. A.; BROOKS, T.M. & J.E. WATSON (2016): Biodiversity: The ravages of guns, nets and bulldozers. Nature 536(7615): 143-145. • SYMES, W.S.; EDWARDS, D.P.; MIETTINEN, J.; RHEINDT, F.E. & L.R. CARRASCO (2018a): Combined impacts of deforestation and wildlife trade on tropical biodiversity are severely underestimated. Nature Communications 9: 4052. • SYMES, W.; MCGRATH, F.; RAO, M. & CARRASCO, L. (2018b): The gravity of wildlife trade. Biological Conservation 218: 268-276. • FRANK, E.G. & D.S. WILCOVE (2019a): Long delays in banning trade in threatened species - Scientific knowledge should be applied with more urgency. Science 363 (6428): 686-688. • AJLIYA, M.; ALTHERR, S.; ARIANO-SANCHEZ, D.; BAARD, E.; BROWN, C. et al. (2016a): Trade in live reptiles, its impact on wild populations, and the role of the European market. Biological Conservation 204, Part A: 103-119. DOI: 10.1016/j.biocon.2016.05.017	We have added two subsections on pets (fishing and hunting)
5	Germany	4	0	0	0	0	Telecoupling could be analyzed in more depth in order to capture the connections between a high consumptive lifestyle in industrialized countries and unsustainable use of wild species.	We have added a subsection on telecouplings
6	Germany	4	0	0	0	0	The scope of ch 4 seems to have been extended from "indirect drivers" to "direct and indirect drivers". Could you please provide a short motivation for this? The current categories of drivers should be reflected upon. For example, can science really talk about "environmental drivers" of "sustainable use of wild species"? Doesn't the "use of species" imply the use by human-related drivers? Also, are all drivers covered by the current categories? Would it make sense to call the ch "Drivers of the use of wild species", thus, removing the word "sustainable"? Finally, the list of drivers does not seem to fully match with the drivers used for the scenarios in ch 5. Please ensure best possible coherence between the different chapters.	Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.
7	Germany	4	0	0	0	0	This is a literature review that tries to address all kinds of drivers in a scientific way. However, as it is also mentioned in the text, it does not give much advice how to solve problems. It is recommended, here, to introduce, at least, some "good examples" in later versions of the text, to try to give some political advice in spite of all complexity.	Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.

8	Jaramillo, Lorena	4	0	0	0	0	<p>UNCTAD BioTrade initiative can contribute with concrete information and cases regarding the positive contribution of trade of wild species as well as cultivated ones, based on the experience of partners and practitioners in over 45 countries and working mainly with flora, but also some experiences in fauna and sustainable tourism (e.g. community based tourism in National Parks in Colombia, and birdwatching and combination of uses such as birdwatching and cocoa harvesting). As the cornerstone we have the BioTrade Principles and Criteria that guide all our interventions which normally support the development of sectors, businesses and value chains and topics/issues covered include: policy frameworks, market access, value chain development, managerial skills, social practices and environmental practices. Some of this information is shared in www.biotrade and relevant publications may be:</p> <ul style="list-style-type: none"> <li>•20 Years of BioTrade: Connecting People, the Planet and Markets with case studies around the globe: <a href="http://unctad.org/en/PublicationsLibrary/ditcted2016d4_en.pdf">http://unctad.org/en/PublicationsLibrary/ditcted2016d4_en.pdf</a></li> <li>•Guidelines for the development and implementation of management plans for wild collected plant species used by organizations working with BioTrade <a href="http://www.biotrade.org/ResourcesPublications/unctad_dtc_ted_2007_8_Eng.pdf">http://www.biotrade.org/ResourcesPublications/unctad_dtc_ted_2007_8_Eng.pdf</a> -- there are some case studies that involve palms as well as other NTFPs that can be shared with the authors if needed. The use of the resource assessments is shown in the publications of 20 years of BioTrade with the Chankuap experience.</li> <li>•Guidelines for the Sustainable Management of BioTrade products: resource assessment <a href="http://unctad.org/en/PublicationsLibrary/ditcted2012d1_en.pdf">http://unctad.org/en/PublicationsLibrary/ditcted2012d1_en.pdf</a></li> <li>•Applicability of traceability systems for CITES-listed medicinal and ornamental plants (Appendices II and III) – Preliminary assessment key findings (enclosed file). The specific study on Applicability of traceability systems for CITES-listed medicinal plants (Appendices II and III) – Greater Mekong: Preliminary assessment. <a href="http://unctad.org/en/PublicationsLibrary/ditcted2016d5_en.pdf">http://unctad.org/en/PublicationsLibrary/ditcted2016d5_en.pdf</a></li> <li>•Handbook for BioTrade and Access and Benefit Sharing (ABS) Policymakers and Regulators: From Concept to Practice (UNCTAD/DITC/TED/2017/6): <a href="http://unctad.org/en/PublicationsLibrary/ditcted2017d6_en.pdf">http://unctad.org/en/PublicationsLibrary/ditcted2017d6_en.pdf</a></li> <li>•Trade and Biodiversity: The BioTrade Experiences in Latin America. <a href="http://www.biotrade.org/ResourcesPublications/UNCTAD_DITC_TED_2010_3.pdf">http://www.biotrade.org/ResourcesPublications/UNCTAD_DITC_TED_2010_3.pdf</a></li> <li>•Traceability information and studies are available at: <a href="https://unctad.org/en/Pages/DITC/Trade-and-Environment/BioTrade/BT-topics-Traceability.aspx">https://unctad.org/en/Pages/DITC/Trade-and-Environment/BioTrade/BT-topics-Traceability.aspx</a> and some useful for the study are: <ul style="list-style-type: none"> <li>•Traceability systems for a sustainable international trade in South-East Asian rubber skins: <a href="https://files.constantcontact.com/fd6be7d3201/1bb03ccc-f178-47be-868b-81c72d62fb0.pdf">https://files.constantcontact.com/fd6be7d3201/1bb03ccc-f178-47be-868b-81c72d62fb0.pdf</a></li> </ul> </li> </ul>	Thanks for these suggestions. We will go through the reports and incorporate them where applicable
9	Jun Wang	4	0	0	0	0	<p>Multidimensional studies and comprehensive assessments of the relationship between global change and biodiversity should be carried out to avoid one-sided findings.</p>	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
10	Jungwiattananorn, Megan	4	0	0	0	0	<p>Chapter 4 is on the drivers of the sustainable use of wild species. The concept of "connectivity" is not mentioned anywhere in the chapter. However, ensuring species' habitats (on land and sea) are well connected is vital to ensuring healthy populations -- and sustainable use of wild species over time. The concept of connectivity could be mentioned in "4.2.1 Environmental Drivers" or "4.2.2 Management of Wild Species" which the report says will have sections to be developed on Management of Protected Areas. The IUCN's Connectivity Conservation Specialist Group is drafting guidance on ecological corridors, it could be a useful reference: <a href="https://files.constantcontact.com/fd6be7d3201/1bb03ccc-f178-47be-868b-81c72d62fb0.pdf">https://files.constantcontact.com/fd6be7d3201/1bb03ccc-f178-47be-868b-81c72d62fb0.pdf</a></p>	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
11	Kathryn Phillips (on behalf of UNEP - WCMC)	4	0	General			<p>Why so little in here on global trade and consumption and population growth as major drivers of use?</p>	We have expanded the section on global trade.
12	Zisenis, Marcus	4	0	0	0	0	<p>Also Chapter 4 of currently 184 pp. in total needs to be shortened by descriptive parts in favour of analysis, discussion and conclusions. Sustainable use of wild species and other biodiversity levels is of course a question of sustainable development in general (UNCED in Rio de Janeiro 1992). Therefore, it is difficult to tackle with this complex issue in one chapter (e.g. wider attempts of the Agenda 21, Convention on Biological Diversity).</p>	Thank you for your comment. Due to the complexity of the chapter and the number of subjects it includes, the chapter is indeed the largest of the assessment. A work to edit and summary information will be done for the futures drafts.
14	Clavel	4	1	from 2102 to 2209	177		<p>In many IFPRI papers, there are references to women's knowledge in agriculture and much more rarely in condiments used for taste, esthetic (colour) and health (vitamins and minerals) as Nere in Africa. The management of resources and assets by women is especially geared towards family food in southern countries and they have much less access to these assets (= "capital" such as commons as land, water, trees and wild plants growing in the bush) compared to men. These aspects are mentioned in the IFPRI poster (joined) and this is what justifies the large IFPRI GAAP project currently in the second phase: <a href="http://gaap.ifpri.info/">http://gaap.ifpri.info/</a>. On these aspects of wild resources for adaptation to CC foods security, research is lacking and should be gender sensitive.</p>	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
15	Germany	4	1	83	1	83	<p>Clarification required: It remains unclear in which way zoonoses are direct drivers.</p>	Thank you for your comment. The text will be clearer in the future versions of the drafts.
16	Germany	4	1	80	2	98	<p>This section on direct and indirect drivers as well as their interlinkages could be highlighted by using a box. Also, references should be made to earlier IPBES assessments and documents which make use of this conceptualization.</p>	Thank you. We have rewritten this part and we have provided a definition of what we mean by "driver of sustainable use" of wild species. We also provided a diagram that illustrate the concept of drivers used for the assessment and how it related to NCP as outlined in IPBES assessments.
17	Jia, Gensuo	4	1	1	1		<p>Chapter 4 builds on the assessments undertaken in Chapter 3, there are several areas in this chapter that can be enhanced: 1. Discussion of impacts of different drivers, political commitment and unexpected/unknown events need to be better linked with societal and human impact. Who are impacted, where and how? 2. The discussion should also highlight linkage between drivers of sustainable use of wild species, human activities and well-being.</p>	The discussion of the impact of different drivers was enhanced. Political commitment was included. Unknown events? well being? to be discussed with CLAS
18	Jia, Gensuo	4	1	1	1		<p>Chapter 4 provides balanced and detailed discussion of the main drivers that influence wild species uses and their outcomes, but falls short of emphasizing the human drivers of the sustainable use of wild species. Human-driven activities also change the distribution and abundance of species as well as damaging service provision of ecosystems and wild resources. Suggesting the authors to add this key message.</p>	Thanks for this suggested change. We have included it in the new version of the draft.
19	Jungwiattananorn, Megan	4	1	72	1	77	<p>When using the phrase "sustainable use" this report should take care that it does not just mean "use". Phrases like "contribute to sustainable use" (line 74) and "drivers of sustainable use" (line 77) later on seem to be referring to unsustainable uses. The drivers for sustainable and unsustainable use are different, please take care in defining and using these terms.</p>	Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.
20	Kathryn Phillips (on behalf of UNEP - WCMC)	4	1	80	2	93	<p>Unclear why bulleting arranged as is. Does bullet one (line 84) include governance frameworks (even if not global - such as mentioned from line 90)?</p>	Thank you for your comment. The text will be clearer in the future versions of the drafts.
21	Kujirakwinja, Deo	4	1	24	1	24	<p>Change unofficial to informal and official to formal</p>	I could not find the line where the word needs to be changed.
22	Kujirakwinja, Deo	4	1	18	1	22	<p>I suggest that the authors list key political drivers that might have emerged from their studies. These may include unstable political environment, changes of governments during the same political terms or changes of regimes, decentralization, elections, etc.</p>	The political drivers section will be re organized and your suggestions will be taken into consideration.
23	Kujirakwinja, Deo	4	1	56	1	56	<p>Uncomplete sentence that need attention</p>	Thank for your comment. Point well taken.
24	Oldfield, Thomasina	4	1	32	1	34	<p>behaviour change approaches are now believed to be as important, if not more, than awareness raising.</p>	Thank for your comment. Point well taken.

25	Rivera Téllez, Emmanuel	4	1	1	1	1	All the chapter talks about drivers of biodiversity loss or drivers to unsustainable use. The chapter name should be changed. Another option is to change the focus of the chapter to highlight what are the drivers that lead to sustainable use (see the bright side and review study cases to determine which are the main drivers that should be present in order to achieve sustainable use). There should be a balance of positive and negative effects on sustainable use in all examples.	We agree. This comment will be incorporated throughout the chapter. LAs! this is a general comment
26	Rivera Téllez, Emmanuel	4	1	1	1	11	There should be a box of key findings to keep the format along other chapters and a quick lecture of the main ideas that the authors try to convey in this chapter.	Thanks for this suggested change. We have included it in the new version of the draft.
27	Rivera Téllez, Emmanuel	4	1	13	1	13	These are not "causal factors driving resource use" they are drivers to biodiversity loss or drivers that aggravate unsustainable use.	Thank for your comment. Point well taken.
28	Stiles, Daniel	4	1	80	2	98	Now drivers of change are discussed, confusing them with drivers of SU. What is this chapter talking about?	Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.
29	Stiles, Daniel	4	1				The OED defines a "driver" as: "A factor which causes a particular phenomenon to happen or develop." The phenomenon in this case according to the chapter title is 'Sustainable Use of wild species'. In that sense, not all of the five factors that are discussed on page 1 are actually drivers that cause SU. Environment and Cultural values/religious beliefs influence how SU will be carried out, they don't cause it to happen. The other three are causes.	Thank for your comment. Point well taken.
30	Treviño Heres, Sofia	4	1	13	1	14	Even if some weather patterns and climatic events have impacts in species populations and their habitats, it is important to clarify that climate change is not an "environmental" driver of change as it has an anthropogenic origin. Maybe the category of "environmental drivers" should not refer to climate change but to climatic events, and highlight that these event may or may not be the result of human activities.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
31	Treviño Heres, Sofia	4	1	1	1	1	Referring to "drivers of sustainable use" is not clear. The chapter should analyze the main characteristics for the use of biodiversity to be considered and sustainable, and the main elements to succeed in achieving it (as some sort of ideal checklist). In order to be consistent with previous IPBES assessments, the chapter should refer to "drivers of change", and analyze levers to achieve sustainable use and drivers of failure, rather than "drivers of sustainable use".	Thank you for your comment. The chapter structure follows the scoping document agreed by IPBES.
32	Fisher, Sue	4	2	119	2	119	I don't know where to include it, but social media must surely merit a mention as a driver of consumption	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
33	Fisher, Sue	4	2	46	2	46	please add bycatch as an example of indirect drivers of loss of biodiversity	It was Added
34	Kathryn Phillips (on behalf of UNEP - WCMC)	4	2	116	3	128	Reads as though it's a ToR for this chapter copied in from a contract.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
35	Kathryn Phillips (on behalf of UNEP - WCMC)	4	2	94	2	98	Why discuss indirect and direct if the framework doesn't allow for this separation?	Thank you for your comment. Indeed the new version of the chapter will not separate indirect and direct drivers.
36	Kathryn Phillips (on behalf of UNEP - WCMC)	4	2	99	2	118	Would be helpful to unpack how the questions outlined here for the chapter relate to the key question (presumably number 5) stated in chapter 1 - to be addressed?	Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.
37	Kujirakwinja, Deo	4	2	117	2	117	Need a dot to separate two lines	It was Added
38	Kujirakwinja, Deo	4	2	103	2	1113	Update numbering	Thank you. Numbering is updated in the SOD.
39	SONALI, GHOSH	4	2	100	1	115	Is there a possibility to revisit the drivers as listed under the recently concluded IPBES global assessment (instead of reinventing them)	Thank you for your comment. Some of the drivers from the Global assessment were taken into account, however since this assessment is about sustainable use of wild species and not exclusively about biodiversity status, some other drivers needed to be taken in account.
40	Adeline Leraibert	4	3	58	3	60	Surely worth citing the IPBES Report on Biodiversity and Ecosystem Services from May 2019, which estimated a million species to be at risk of extinction, and listed direct exploitation of organisms as the second most significant driver of biodiversity decline. IPBES. 2019. Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. S. Diaz, J. Settele, E. S. Brondizio E.S., H. T. Ngo, M. Guèze, J. Agard, A. Arneft, P. Balvanera, K. A. Brauman, S. H. M. Butchart, K. M. A. Chan, L. A. Garibaldi, K. Ichii, J. Liu, S. M. Subramanian, G. F. Midgley, P. Miloslavich, Z. Molnár, D. Obura, A. Pfaff, S. Polasky, A. Purvis, J. Razaque, B. Reyers, R. Roy Chowdhury, Y. J. Shin, I. J. Visseren-Hamakers, K. J. Willis, and C. N. Zayas (eds.). IPBES secretariat, Bonn, Germany. XX pages.	Thank you. IPBES 2019 will be cited as advised
41	Fisher, Sue	4	3	64	3	64	bushmeat, INCLUDING AQUATIC WILD MEAT.	was included
42	Adeline Leraibert	4	4	149	4	149	The use of the term 'sustainable use' suggests that the effects will accrue on uses that are sustainable. It cannot be assumed that use is 'sustainable' until it has been demonstrated to be so, So surely this should say "have an effect on the sustainability of use of wild species?"	We changed it to 'have an effect on the sustainability of use of wild species'
43	Fisher, Sue	4	4	157	4	157	please note in respect of "release of pollutants" that many bioaccumulate in the marine food web to humans, which has particular implications for indigenous peoples. See for example, AMAP Assessment 2018: Biological Effects of Contaminants on Arctic Wildlife and Fish. Summary for Policy-Makers. Arctic Monitoring and Assessment Programme (AMAP), Oslo, Norway. 8 Available at: <a href="https://www.amap.no/documents/download/3297/inline">https://www.amap.no/documents/download/3297/inline</a>	We added the following sentence. In marine environment, many of pollutants accumulate in marine organisms and if humans consume marine food from polluted areas, they are exposed to pollutants (AMAP 2018). This has serious implications to indigenous people who consume large amounts of marine food including the blubber of marine mammals (Donaldson et al. 2010).
44	Jun Wang	4	4	148	4	149	More details are needed to explain how the impact of climate change on food security influences the sustainable use of wild species.	There are discussions about climate change and food security in the lines from 195-199. We added the following information. Climate change has already reduced overall consumable food calories in ten major crops by 1% globally with much variation among crops and regions (Ray et al. 2019).
45	Jun Wang	4	4	163	4	164	There are many good examples about the impact from the building of dams to ecosystem such as dams in China and Brazil. There are some references as examples. Loures, R. & Pompeu, P. (2019). Temporal changes in fish diversity in lotic and lentic environments along a reservoir cascade. Freshwater Biology, 64(10), 1806-1820. Linarea, M., et al. (2019). Small hydropower dam alters the taxonomic composition of benthic macroinvertebrate assemblages in a neotropical river. River Research and Applications, 1-11. Liu, X., et al. (2019). Biodiversity pattern of fish assemblages in Poyang Lake Basin: Threat and conservation. Ecology and Evolution, 00:1-12. Marques, H., et al. (2018). Importance of dam-free tributaries for conserving fish biodiversity in Neotropical reservoirs. Biological Conservation, 224:347-354. Wang, J., et al. (2019). The effects of dams on macroinvertebrates: Global trends and insights. River Research & Applications, 35:702-713. Li, Y., et al. (2019). Impacts of land consolidation on rural human-environment system in typical watershed of the Loess Plateau and implications for rural development policy. Land Use Policy, 86:339-350.	We added the following sentences to the text. Dams substantially modified lotic ecosystems causing extirpation of fish migration (Liu et al. 2019), loss of native fish species and increase of non-native fish (Loures and Pompeu 2019) and decrease diversity of benthic macro invertebrate (Linarea et al. 2019).
46	Jungwattanaporn, Megan	4	4	149	4	149	Does the phrase "effect on the sustainable use of wild species" refer to the ability for sustainable use or what sustainable use means in light of those changes?	We changed the sentence based on the comment of a reviewer. Thank you.

47	Kathryn Phillips (on behalf of UNEP - WCMC)	4	4	134	4	135	driver of sustainable use'... only looking at already established sustainably-used species or is use of the term sustainable used pre-maturely again?	Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.
48	Kathryn Phillips (on behalf of UNEP - WCMC)	4	4	132	4	132	Is it about drivers of sustainable use - or drivers of use that may or may not be sustainable ...?	Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.
49	Kathryn Phillips (on behalf of UNEP - WCMC)	4	4	144	4	167	Para lack any references against several statements made.	References are added
50	Kujirakwinja, Deo	4	4	147	4	147	change deplete the provision of goods from ecosystems to degrade the provision of goods and services from ecosystems	Changed. Thank you.
51	Kujirakwinja, Deo	4	4	120	2	120	Remove parenthesis	was removed
52	Le Pape Olivier	4	4	144	4	167	Ok with chapter 4.2.1. Environmental Drivers. But there is a need to add similar impacts on marine and coastal habitats. Climate change also impact ocean and land reclamation and habitat degradation dramatically impact coastal habitats	We agree that we need to add similar impacts on Marine and coastal habitats.
53	Meera Anna Oommen	4	4	134	4	142	Same concern as the previous comment: These sentences again start by saying that the chapter will address 'the status and trends in the drivers of the sustainable use of species' and goes on to describe the various environmental, political, social, cultural drivers and so on. It would help if the authors rephrased some of this.	Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.
54	Oldfield, Thomasina	4	4	148	4	149	Climate change will also impact movement (migration) of people in response to food security and other impacts further impacting on use of species.	We agree that climate change will also impact migration of people. We added the following line. The negative effects of climate change on agricultural productivity caused increase emigration from developing countries, an especially strong impact in poor countries but less so in middle income countries (Falco et al. 2019).
55	SONALI, GHOSH	4	4	144	4	149	may please check if all environmental drivers are covered as already defined in past IPBES assessments.	We check previous assessments of IPBES. Thanks
56	Doering, Ralf	4	5	171	5	181	What is with the effects on aquatic ecosystems? There is a lot of research on effects of CC on marine ecosystems (see ceresproject.eu). Acidification may be the main problem for all marine ecosystems together with warming which lead to changes in species distribution.	Thank you for your comment. This was a complete oversight, and will be addressed in the next draft.
57	Kenward, Robert	4	5	169	5	171	Maybe worth spelling out in a text paragraph that, by number of species affected, hunting is the 6th most important threat (after logging, crop farming, stock farming, urbanisation and invasive species), with fishing 9th and gathering 19th. Hunting affects 27% of species subject to overexploitation.	We are under discussion about this figure. We will mention it in the text if we retain this figure. Thank you.
58	Le Pape Olivier	4	5	172	5	181	Ok with chapter 4.2.1.1. Climate change. But there is here also a need to add similar impacts on marine and coastal habitats: polar drift and changes in productivity	Thank you for your comment. This was a complete oversight, and will be addressed in the next draft.
59	Meera Anna Oommen	4	5	Figure 4.1	NA	NA	I would urge the authors to take a second, closer look at Maxwell et al. 2016 and not to take its results at face value. This is a misleading analysis which not only embodies, but aggravates the inconsistencies of the red listing process. The IUCN Red List is not taxonomically standardised and hence its analysis is likely to be biased in favour of key taxonomic groups and threats that are assessed. We know that the individual species assessments tend to identify direct and highly visible impacts such as overexploitation and use (i.e the Red List tends to showcase these species) as opposed to pervasive drivers impacts such as pollution and climate change which are difficult to quantify or assess (for instance the impact of climate change on agriculture and food security is likely to have very significant repercussions for the use of wild species as well). Moreover, this is a very static analysis that just looks at individual species without addressing a whole range of issues such as ecosystem processes that can unfold in the face of climate change and system modification. In my view, the extrapolation of results on IUCN Red List data in this fashion results in an underrepresentation of pervasive impacts and overall misidentification of impacts at the global scale. Hence, these results should not be taken or presented without accompanying commentary about the caveats of such an analysis. There is no accompanying analytical text for Figure 4.1 in this chapter, it would be helpful to understand what exactly the authors are trying to convey here. I agree that overexploitation, agriculture, etc. are major issues, but the question is about their impacts in comparison drivers which are not adequately assessed.	Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.
60	Oldfield, Thomasina	4	5	Figure			Suggest you check on figures in this graphic with the IUCN Red List unit - Ask Craig Hilton Taylor.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
61	White, Michael	4	5	179	5	181	Add IPCC report on Oceans and Cryosphere 2019	Noted with thanks, will be done in next draft.
62	Germany	4	6	195	6	196	There are also constant efforts to breed cultivars that are able to cope with e.g. drought and heat stress (e.g. Newton et al. 2011). Sources for interesting traits (genes) can be crop wild relatives (e.g. Hajjar and Hodkin et al. 2007).  Hajjar, R., Hodgkin, T., 2007. The use of wild relatives in crop improvement: A survey of developments over the last 20 years. Euphytica 156, 1–13. <a href="https://doi.org/10.1007/s10681-007-9363-0">https://doi.org/10.1007/s10681-007-9363-0</a>  Newton, A.C., Johnson, S.N., Gregory, P.J., 2011. Implications of climate change for diseases, crop yields and food security. Euphytica 179, 3–18. <a href="https://doi.org/10.1007/s10681-011-0359-4">https://doi.org/10.1007/s10681-011-0359-4</a>	Noted with thanks, will be added in next draft.
63	Gopalsamy Poyyamoli	4	6		6		point 29 - line 4 . Insert - water - should be land/water management	the comment does not correspond to the line mentioned
64	Jun Wang	4	6	193	6	194	This view is suitable for most conditions. While there are some special cases, such as in the alpine region (eg. The Qinghai-Tibet Plateau in China), the climate change resulted in more mountain snowmelt and increasing temperature, and it will have different impacts on agricultural production or biodiversity for some time. There are some research at the Qinghai-Tibet Plateau in China as the examples of alpine regions. Zhang, Y., et al. (2016). Climate change and human activities altered the diversity and composition of soil microbial community in alpine grasslands of the Qinghai-Tibetan Plateau. Science of the Total Environment, 562:353-363. Zhang, Y., et al. (2015). Effects of grazing and climate warming on plant diversity, productivity and living state in the alpine rangelands and cultivated grasslands of the Qinghai-Tibetan Plateau. Rangeland Journal, 37(1): 57-65. Wu, X., et al. (2019). Atmospheric Water Demand Dominates Daily Variations in Water Use Efficiency in Alpine Meadows, Northeastern Tibetan Plateau. Journal of Geophysical Research-Biogeosciences. 124(7):2174-2185.	Noted.
65	Kujirakwinja, Deo	4	6	209	6	209	correct from to from	Changed. Thank you.
66	Le Pape Olivier	4	6	209	6	209	a typo: from instead of from	Changed. Thank you.
67	Le Pape Olivier	4	6	205	16	584	I feel it strange to separate habitat degradation (4.2.1.2) from 4.2.1.4 Land ans seascape change and 4.2.1.6 Habitat conversion I suggest to combine these 3 sub-chapters.	Thank you. We follow the IPBES previous assessments, we are under discussion on the merging/separating these three sections.

68	Le Pape Olivier	4	6	193	6	204	Similarly, I suggest to add to valuable insights on agriculture, similar impacts on fisheries (northern drift and loss in productivity)	Noted with thanks, will be added in next draft.
69	Skern-Mauritzen, Mette	4	6	216	6	218	I do not agree with the statement 'To assess anthropogenic ecosystem 216 degradation, the reference condition of pre-degradation state also known as its natural state is 217 necessary, but it is a challenge to establish the natural state for an ecosystem'. For many systems there is no meaningful 'natural' state, as humans has been influencing the systems for such a long time. It is still possible to evaluate the state and development of systems	We changed the sentence as, To assess anthropogenic ecosystem degradation, the reference condition of pre-degradation state also known as its natural state is necessary but it is a challenge to establish the natural state for an ecosystem because humans have been influencing the system for such a long time.
70	White, Michael	4	6	193	6	196	Pers. obs. Pollen no longer viable at Tongareva Atoll 2018-2019: flowers won't set to fruit	Noted.
71	Bélangier, Julie	4	7	231	7	231	Agrobiodiversity' should be replaced with 'agriculture'.	Changed. Thank you.
72	Kujirakwinja, Deo	4	7	234	7	234	Change Almost of 3.9% to Almost 3.9%	Changed. Thank you.
73	Doering, Ralf	4	8	284	8	284	Whole chapter: I could not find anything on seascape changes besides effects of pollution (which are important). But this are not the only effects, e.g. oil extraction, sand and gravel extraction, building of wind farms etc.	We agree that we are dearth of expertise in marine and aquatic ecosystems. We will take care of marine part in revised version.
74	Kathryn Phillips (on behalf of UNEP - WCMC)	4	8	284	18	638	This section provides a very detailed and interesting - if not stark view of all global threats to and impacts on biodiversity on the land and in the sea, changes to ecosystems and therefore some information about NCP, however it does not provide information (despite the numerous subheadings describing a discussion of various changes an dtheir impacts on 'sustainable use') about how these changes relate to use of wild species that would be useful in the discussion around sustainability. Would suggest thinning the detail on drivers of change and more on how those changes relate to changes in use of species?	We completely agree with you comment. We have changed the structure for the new draft. It will address the part how these changes relate to use of wild species.
75	Kathryn Phillips (on behalf of UNEP - WCMC)	4	8	287	4	288	Wording used again suggesting use of wild species has been sustainable ...in ref to major changes in land/seascape.	It is not clear to me what does it mean. If you are referring to change in land and seascape. We have addressed it.
76	Kenward, Robert	4	8	278	8	278	Italic continues too far.	Changed. Thank you.
77	Kujirakwinja, Deo	4	8	277	8	278	Add the therapeutic use of lantana camara in Africa, essentially in DRC for both human and domestic animals	We added 'Lantana camera is also used as antipyretic and carminative and in the treatment of respiratory system infections (Barreto et al. 2010).'
78	Le Pape Olivier	4	8	264	8	266	Consequences of invasive species on marine and coastal habitats also include loss in transfer to upper levels of the trophic chain	We added 'Invasive species also disrupt tropic cascades causing the mismatch of evolutionarily based strategies among predators and prey (Kimbrow et al. 2009).'
79	Le Pape Olivier	4	8	279	8	283	Consequences on ecosystem services do not impacts agriculture only, but also fisheries	Changed. Thank you.
80	Le Pape Olivier	4	8	284	15	537	This chapter o 4.2.1.4. Land and seascape change focus only on landscape without any reference to seascape, and especially coastal seascape. Another 4.2.1.4.6 subpart on marine and coastal habitat change would be useful	We agree that we are dearth of expertise. We will take care of marine part in revised version.
81	SONALI, GHOSH	4	8	289	9	358	Human -animal conflict in urban areas in both developed and developing countries may be highlighted	We added. In and around urban areas, human-wildlife conflict is responsible for billions of dollars of damage and costs association with mitigation and prevention (Conover 2001). Urban environments are notorious source of mortality of wildlife including roads, collision with buildings, depredation and disease (Forman and Alexander 1998, Loss et al. 2014, Nyhus 2016).
82	Zisenis, Marcus	4	8	267	8	283	Very good, not to take a dogmatic enemy approach towards non-native species, but a balanced scientific one as case by case study: e.g. Davis, M.A., Chew, M.K., Hobbs, R.J., Lugo, A.E., Ewel, J.J., Vermeij, G.J., Brown, J.H., Rosenzweig, M.L., Gardener, M.R., Carroll, S.P. and Thompson, K., 2011. Don't judge species on their origins. Nature, 474(7350), p.153. <a href="https://www.fs.fed.us/global/intl/pubs/ja_iit/2011_Davis001.pdf">https://www.fs.fed.us/global/intl/pubs/ja_iit/2011_Davis001.pdf</a>	Thank you.
83	Fisher, Sue	4	10	340	10	340	Urban trees also provide habitat for wild species	We added, Urban trees and grassland also provide habitats for different species of animals including birds, bees, butterflies and hoverflies (Dylewski et al. 2019; Han et al. 2019).
84	White, Michael	4	10	359	10	359	Cement use is a major source of GHGs	Agree. Thank you.
85	Bélangier, Julie	4	11	388	13	455	The report on The State of the World's Biodiversity for Food and Agriculture (FAO 2019, chapter 5, pp. 191-304) provides details on the state and trends of adoption, based on the analysis of country reports and the review of relevant recent literature, of around 20 practices and approaches at field, production system, landscape and seascape levels that can benefit biodiversity.	Thank you. I have seen the report and will modify the context accordingly.
86	FUNABASHI Masatoshi	4	11	388	13	455	Recent studies revealed the cases where biodiversity-intensive small-scale agriculture including agroforestry approach can go beyond conservation vs. development scenario, namely "net positive impact" and "augmentation scenario". A typical example is the Synecoculture project in sub-Saharan Africa. A comprehensive review with the citation of evidence is available on the following Nature article : "Human augmentation of ecosystems: objectives for food production and science by 2045" <a href="https://www.nature.com/articles/s41538-018-0026-4.pdf">https://www.nature.com/articles/s41538-018-0026-4.pdf</a>	Thank you for providing the reference.
87	Butchart, Stuart	4	12	418			Fig 4.2 use of the term 'red-listed' is discouraged because of its ambiguity. All species are listed on the red list, but many are Least Concern. I think you mean 'threatened (ie CR, EN, VU) and Near Threatened'.	We added those three categories in the caption. Thank you.
88	CAMARENA, Maria	4	12	416	12	417	Make the precision in the text of the graph that red-listed species refers to the IUCN Red List.	This figure is adopted from Maxwell et al. (2016). We will put the information in the text. Thank you.
89	Germany	4	12	414	12	416	Species loss does not per se reduce production (of biomass). Species identity is also important, and likely more important than species richness. Hence, we encourage the authors to use a more differentiated approach.	We changed the sentence as "Species loss has effect on productivity (biomass production by plants) and decomposition (mass loss of plant litter) (Hooper et al., 2012) hence has an impact on the sustainable use of wild species. However, the plant species identity are also important in affecting decomposition (Vivanco and Austin 2008).'
90	Germany	4	12	431	13	446	The project "F.R.A.N.Z." is an example for improved practices that favour biodiversity on 'conventional' agricultural farms in Germany: Within F.R.A.N.Z., environmentalists and farmers work together to trial conservation measures on ten representative (demonstration) farms in Germany. These measures (e.g. flowering strips, bird islands, summer cereal with flowering lower seeds) should promote biodiversity, but at the same time be practicable and economically viable for the farm. Successful measures will be communicated and promoted in the farming community, with the intention to increase implementation at national scale. Another focus of F.R.A.N.Z. is providing policy recommendations to improve regulatory and publicly funded instruments to the benefit of biodiversity and farmers. <a href="https://www.franz-projekt.de/">https://www.franz-projekt.de/</a>	A project such as F.R.A.N.Z (Future Resources, Agriculture and Nature Conservation) in Germany was initiated to develop and test measures to preserve and increase biodiversity in agricultural landscape ( <a href="https://www.franz-projekt.de/website/english-summary">https://www.franz-projekt.de/website/english-summary</a> ).
91	Molnár, Zolt	4	12	424	12	424	There is a brand new publication on intact forest landscapes in Indigenous lands (hopefully already available online): John Fa et al.: Importance of Indigenous Peoples' lands for the conservation of intact forest landscapes. <i>Frontiers in Ecology and the Environment</i> .	We changed the sentence as Approximately 11% of the world's forested lands are included within territories occupied by indigenous peoples (Sobrevila, 2008) and at least 36% intact forest landscapes (IFLs) are within indigenous People's lands (Fa et al. 2020).
92	Jungwittanaporn, Megan	4	13	437	13	438	This line could be unpacked more. How do agriculture certifications restrict hunting and how do hunting restrictions promote sustainable use? (It seems there's a time frame component here as well, less use now means possible use in the future)	We modified the sentence as Positive and potentially indirect effects of certification on biodiversity were reported (Tschamtko et al. 2015). For example, sustainable certification schemes of oil palm significantly reduce deforestation but not fire or peatland clearance (Carlson et al. 2018).
93	Kujirakwinja, Deo	4	13	45	13	460	Not sure the	Comment not clear.
94	López-Castro, Melania	4	13	456	13	471	This section is a little confusing with the data presented and the way it is written. It mentions an increase in tree coverage in the tropics but later mentions deforestation increase in the same region. Please review.	Sorry for the confusion. It didn't mention an increase tree coverage in the tropics. It reads as Globally tree cover has increased by 2.24 million km <sup>2</sup> (7.1% relative to the 1982 level) during the period 1982-2016 as a result of a net loss in the tropics being outweighed by a net gain in the extratropics (Song et al., 2016).
95	Adeline Lerambert	4	14	493	4	496	Depending on how plantation forests/commercially exploited forests are managed. Eg <a href="https://www.fsc-uk.org/en-uk/newsroom/id/608">https://www.fsc-uk.org/en-uk/newsroom/id/608</a>	Agree. Thank you.
96	Adeline Lerambert	4	15	535	15	537	This is not always the case - for example Chetwan NP in Nepal where poaching of megafauna has significantly declined as a result of practices which have included eviction of communities in the park and buffer zone, albeit also the engagement of local people in wildlife protection activities <a href="https://digitalcommons.fiu.edu/cgi/viewcontent.cgi?article=5027&amp;context=etd">https://digitalcommons.fiu.edu/cgi/viewcontent.cgi?article=5027&amp;context=etd</a>	As per previous reviewer's comment, we changed the sentence. The case of Chitwan NP is different. They didn't evict indigenous communities (traditional tharu and tamangs) but illegal settlers. Furthermore there is no clear evidence that eviction has helped to reduce poaching. Currently, anti poaching squad are formed by involving local communities that has helped to reduce poaching. <a href="https://conbio.onlinelibrary.wiley.com/doi/pdf/10.1111/cobi.12894">https://conbio.onlinelibrary.wiley.com/doi/pdf/10.1111/cobi.12894</a>

97	Germany	4	15	543	15	546	Additionally, roughly one third of the food produced for human consumption every years gets lost or wasted ( <a href="http://www.fao.org/save-food/resources/keyfindings/en/">http://www.fao.org/save-food/resources/keyfindings/en/</a> ).	We added, Additionally, about 1.3 billion tons of food produced for human consumption is wasted per year and the lost on a per capita basis is higher in industrialized world than in developing countries (FAO, 2011).
98	Kenward, Robert	4	15	532	15	536	Better as "Sometimes, indigenous ...", "... areas can lead to an increase ..."?	Changed. Thank you.
99	Kenward, Robert	4	15	519	15	519	Specifically (domestic) 'livestock' or 'large herbivores including domestic livestock'?	Changed. Thank you.
100	Le Pape Olivier	4	15	538	15	538	There is no part 4.2.1.5 (and see previous remark and suggestion to pool 4.2.1.2, 4.2.1.4 and 4.2.1.6)	We are under discussion to merge these sections.
101	Fisher, Sue	4	16	593	16	593	Please identify heavy metals and organochlorines as significant threats to marine mammals, and their human consumers. See for example  UN-Environment, 2019. Global Mercury Assessment 2018. UN-Environment Programme, Chemicals and Health Branch, Geneva, Switzerland. 59 pp. Available at: <a href="https://www.amap.no/documents/doc/global-mercury-assessment-2018/1757">https://www.amap.no/documents/doc/global-mercury-assessment-2018/1757</a>  AMAP, 2017. AMAP Assessment 2016: Chemicals of Emerging Arctic Concern. Arctic Monitoring and Assessment Programme (AMAP), Oslo, Norway. xiv+353pp. Available at: <a href="https://www.amap.no/documents/doc/amap-assessment-2016-chemicals-of-emerging-arctic-concern/1624">https://www.amap.no/documents/doc/amap-assessment-2016-chemicals-of-emerging-arctic-concern/1624</a>	Changed. Thank you.
102	Le Pape Olivier	4	16	585	16	585	4.2.1.7. Pollution. Deals with pollution AND eutrophication. Nutrient loadins is not a pollution, only the excess is a problem. I thus suggest to change the title by adding "and eutrophication"	Thank you for your comment. The title chaged to "pollution and eutrophication"
103	Le Pape Olivier	4	16	654	16	654	I suggest to precise "Terrestrial" wild animals when describing hunting. Aquatic animals are targeted by fishing	Thank you for the comment. Technical suggestions and references will be updated as we work on the Second Order Draft.
104	Martin Jean-Louis	4	16	549	16	549	Spelling of author name is Fahrig (not Fahring)	It was corrected
105	Jun Wang	4	17	587	17	587	More details about the impacts of pollution of soils on sustainable use of wild species are needed.	Thank you for your comment. Details about the impact of pollution of soil on sustainable use of wild species added to text
106	White, Michael	4	17	623	17	624	Include marine heatwaves	Changed. Thank you.
107	White, Michael	4	17	88	17	92	Ozone degradation is worsening again: bromines and chlorines in GHGs are likely culprits	Thank for your comment. Point well taken.
108	White, Michael	4	17	606	17	616	Perfect! Well done	Thank you.
109	't Sas-Rolfes, Michael	4	18	662	19	667	Most of the references in this section are missing from the list of References; there are also many other places in this chapter where references are missing from the final list.	Thanks for this suggested change. We have included it in the new version.
110	Jungwittanaporn, Megan	4	18	639	18	651	Section 4.2.2 "Management of Wild Species" uses the term "sustainable use" as if any use is sustainable. However, not all uses are sustainable. Note line 642-643; uses that "significantly reduce population/availability" should not be considered sustainable. Please take care when defining and using the term "sustainable use".	Thank for your comment. Point well taken.
111	Kathryn Phillips (on behalf of UNEP - WCMC)	4	18	640	18	641	Re 'sustainable use of wild species'. As with all other similar phrases - this should read 'influenced the sustainability of use of wild species'. Sustainability is under review!!	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
112	Kathryn Phillips (on behalf of UNEP - WCMC)	4	18	640	18	651	Would suggest this section not quired here re repeat of earlier section (impact of extractive processes) and doesn't fit the introductory aims re drivers affecting sustainability of use.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
113	Kenward, Robert	4	18	662	18	662	"globally extinct as a result of hunting or persecution in the past"	Thank you for the comment. Technical suggestions and references will be updated as we work on the Second Order Draft.
114	Kenward, Robert	4	18	653	24	824	It is unacceptable biased that 4.2.2.1.1 has focussed on Bushmeat and Trophy Hunting, with a Box on Falconry, and not included extensive non-trophy hunting managed sustainably in North America and Europe from which latest annual spending data of \$26 billion in USA and of €16 billion in Europe on hunting alone motivate habitat conservation. At the least it should cover <a href="https://wsfrprograms.fws.gov/subpages/nationalsurvey/nat_survey2016.pdf">https://wsfrprograms.fws.gov/subpages/nationalsurvey/nat_survey2016.pdf</a> (p.4) and data for Europe in Kenward, R., Manos, B., Arampatzis, S., & Papathanasiou, J. (2009). A transactional environmental support system for Europe. In Hradec, J., Pelikán, E., Mirovský, O., Pilmann, W., Holoubek, I., & Legat, R. (Eds.) Towards eEnvironment (Challenges of SEIS and SISE: Integrating Environmental Knowledge in Europe)(pp. 58-65). Brno, Czech Republic: Masaryk University.	Thank you for the comment. Technical suggestions and references will be updated as we work on the Second Order Draft.
115	Kujirakwinja, Deo	4	18	657	18	659	Need to include the cultural use of hunting products for traditional ceremonies (e.g., enthronement of traditional chiefs) and rituals	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
116	Kujirakwinja, Deo	4	18	654	18	655	Should read for a variety	Owing to the discussion held during SAM, the section on hunting is being completely dissolved and will be infused in different other sections.
117	White, Harold	4	18	639	24	824	Again, there is a critical failure to address the use of highly regulated hunting and trapping used in North America to very sustainably manage numerous species of wildlife. The conservation model used in North America relies on hufing and it has proven extremely effective.	Thank you for the comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
118	White, Michael	4	18	631	18	633	Explain dead zone is deoxygenated or anoxic	We added. Dead zones are the areas of water bodies where survival of aquatic life is impossible due to low oxygen levels.
119	Adeline Lerambert	4	19	699	19	701	Also relevant to include the growth of commercial demand for bushmeat among domestic and overseas urban and diaspora populations.	Thank you for the comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
120	Adeline Lerambert	4	19	678	19	679	Important to also provide references for the contrary view.	Noted. References are being updated in the next draft.
121	Adeline Lerambert	4	19	673	19	674	The social acceptability and economic advantages of hunting vary widely. This is a difficult statement to justify.	The comment is not very clear. Hunting has different degree of social acceptability and economic reward, and no two countries are similar. Anyways, Owing to the discussion held during SAM, the section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the SOD.
122	CAMARENA, Maria	4	19	682	19	682	This is a recurring issue throughout SUA chapters. References to bushmeat, or bush-meat, shall be consistently replaced with "wild meat".	Yes, this has been discussed and sorted out.
123	Fisher, Sue	4	19	665	19	665	Please add reference to impact of commercial whaling, such as: Rocha, Jr & Clapham, Phillip & Ivashchenko, Yulia. (2015). Emptying the Oceans: A Summary of Industrial Whaling Catches in the 20th Century. Marine Fisheries Review. 76. 37-48. 10.7755/MFR.76.4.3.	Thank you for the comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
124	Freyer, Daniela	4	19	674	19	681	Scientific literature on the negative ecological effects of hunting should be included here. For example: Abernethy, K. A., 2013. Extent and ecological consequences of hunting in Central African rainforests in the twenty-first century. doi: 10.1098/rstb.2012.0303. Also, please see literature suggestions in comment below.	Thank you for the comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
125	Kathryn Phillips (on behalf of UNEP - WCMC)	4	19	720	19	720	I don't think (well established) is a suitable referencing technique!	Will recheck
126	Kenward, Robert	4	19	674	19	675	"While scientific literature generally associate hunting with negative ecological consequence" -literature should be cited	The statement was made with reference with some of the highly reputed publications over the last decade. However, the section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.

127	Kenward, Robert	4	19	674	19	675	"While scientific literature generally associate hunting with negative ecological consequences" is a sweeping and politically controversial assertion. If it is based on literature analysis, the literature should be cited so that a check can be made that it includes the extensive literature in game management journals. Otherwise it should be removed.	The statement was made with reference with some of the highly reputed publications over the last decade. However, please note, the section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
128	Kenward, Robert	4	19	680	19	681	Any such analysis should be done in good enough time to be checked for source bias.	Thanks. Will recheck
129	Meera Anna Oommen	4	19	691	19	697	The references suggesting these estimates require a closer look. For instance, the Kanagavel et al (2106) is not the primary source of this information. Kanagavel et al quote these numbers from Fa and Peres 2001, and Fa et al 2002, who estimate these figures for Afrotropical and Neotropical forest (specifically the Congo and Amazon basins). They should not be mistaken for global estimates as regions vary according to productivity and rates of harvesting.	The statement was made with reference with some of the highly reputed publications over the last decade. However, the section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
130	White, Michael	4	19	678	19	680	KwaZulu-Natal park funded many conservation activities by selling a few big game trophy shoots; some animals would have been culled anyway for population stability	Thank you for sharing the case. We will definitely look into it.
131	Kujirakwinja, Deo	4	20	717	20	719	Maybe add the example of the decline of Grauer's gorillas in the eastern DRC where the species has declined by 80% ( <a href="https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0162697">https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0162697</a> ), also for hippopotamus population that have declined by over 90% in Virunga NP ( <a href="https://open.uct.ac.za/bitstream/handle/11427/4753/thesis_sci_2010_kujirakwinja_d.pdf?sequence=1">https://open.uct.ac.za/bitstream/handle/11427/4753/thesis_sci_2010_kujirakwinja_d.pdf?sequence=1</a> )	The statement was made with reference with some of the highly reputed publications over the last decade. However, the section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
132	Kujirakwinja, Deo	4	20	703	20	706	Maybe check on Beyer et al. 2011 regarding the <a href="https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0027129">https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0027129</a>	Thanks.
133	Germany	4	21	726	21	727	This section should refer to increasing use of aviation vehicles such as helicopters and drones to hunt animals.	The statement was made with reference with some of the highly reputed publications over the last decade. However, the section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
134	Kathryn Phillips (on behalf of UNEP - WCMC)	4	21		21		Box 4.1 this and text prior could much better be placed within chapter 3 under wild meat discussions of uses and a lacking discussion there of extraction/harvesting technique impacts on sustainability.	The statement was made with reference with some of the highly reputed publications over the last decade. However, the section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
135	Kenward, Robert	4	21	731	21	731	In Box 4.1, "species that are susceptible to lead poisoning" – not 'increasingly', because lead ammunition is gradually being phased out.	The statement was made with reference with some of the highly reputed publications over the last decade. However, the section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
136	't Sas-Rolfes, Michael	4	22	738	24	807	In this section, some of the figures refer to a paper that is now 12 years old (Lindsey 2007), whereas other are more recent (and therefore higher - e.g. Saayman et al, 2018). This creates some confusion. It may also be worth discussing how this industry is evolving and some of the challenges it faces: see <a href="https://iopscience.iop.org/article/10.1088/1748-9326/aa854b">https://iopscience.iop.org/article/10.1088/1748-9326/aa854b</a>	The statement was made with reference with some of the highly reputed publications over the last decade. However, the section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
137	Adeline Lerambert	4	22	765	22	776	Again this is one sided and needs to be balanced. Studies and reports have increasingly questioned the economic, conservation and societal values of trophy hunting activities, and its sustainability. Trophy hunting operations are highly profit driven, with most of the proceeds benefitting only a small number of professional hunters and hunting outfitters, many of whom are not from or located in the areas or even the countries in which the hunting takes place. Research suggests that hunting companies contribute on average only 3% of their revenue to communities living in hunting areas ( <a href="http://www.ecolarge.com/work/the-200-million-question-how-much-does-trophy-hunting-really-contribute-to-african-communities/">http://www.ecolarge.com/work/the-200-million-question-how-much-does-trophy-hunting-really-contribute-to-african-communities/</a> ). The US Democratic staff of the House Committee on Natural Resources in its report 'Missing the Mark' ( <a href="http://democrats-naturalresources.house.gov/imo/media/doc/Missing%20the%20Mark.pdf">http://democrats-naturalresources.house.gov/imo/media/doc/Missing the Mark.pdf</a> ) stated: "Our analysis shows that trophy hunting cannot be assumed to have a conservation benefit on the strength of a guarantee that hunters' fees will flow to communities or wildlife agencies. Additional oversight is necessary to ensure that importing trophies of ESA listed species is in fact helping those species survive in the wild." We also note the recent withdrawal of support for trophy hunting operations in Zambia by Community Resource Boards, highlighting the lack of financial benefits reaching local communities ( <a href="https://www.facebook.com/Zambia-National-Community-Resources-Board-Association-106217734103766/?ref=nt&amp;hc_ref=ARQ9FZBVLS9dHe3Eh1LMKb_MqBgnq7Kk2lgix4xQKeKmtO5RI4luHDSvYtVNUtnyq">https://www.facebook.com/Zambia-National-Community-Resources-Board-Association-106217734103766/?ref=nt&amp;hc_ref=ARQ9FZBVLS9dHe3Eh1LMKb_MqBgnq7Kk2lgix4xQKeKmtO5RI4luHDSvYtVNUtnyq</a> ).	The statement was made with reference with some of the highly reputed publications over the last decade. However, the section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
138	Adeline Lerambert	4	22	750	22	750	This assertion relies on a 12 year old reference.	The statement was made with reference with some of the highly reputed publications over the last decade. However, the section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
139	Adeline Lerambert	4	22	753	22	764	This case study is biased and misleading. In a 2015 report commissioned by Saran Club International entitled 'The Economic Contributions of Hunting-Related Tourism in Eastern and Southern Africa', it claims that trophy hunters contribute US\$426 million annually to the GDP of 8 African countries creating 53,000 jobs, and that: "hunting provides Africa with significant economic benefits to the countries and communities who host these travellers in total and per hunter". The report seems to equate what hunters spend with their contribution to the GDP of the African countries in the study. The amount claimed is more than double the US\$200 million 'total spend' estimated for the whole of sub-Saharan Africa back in 2007. In a 2017 report Ecolarge stated that "a more realistic estimate is less than \$132 million per year".  The SCI report goes on to suggest that: "the estimated contribution to conservation through fees paid to landowners (private, community, and government) alone is estimated to be within the range of \$26.7 million to \$40.2 million each year.", albeit they themselves recognise that this is 'imprecise'. However, this only represents 6.3-9.4% of their claimed spend by trophy hunters, and given that 'fees paid' to private, community and government landowners won't necessarily all go into conservation, the actual claimed financial contribution to conservation is very small.  By contrast, in their 2015 report 'Towards Measuring the Economic Value of Wildlife Watching Tourism in Africa' the UN World Tourism organisation stated that total international tourism receipts for Africa in 2013 reached US\$ 34.2 billion, the majority of which was wildlife watching oriented, and that international tourist arrivals in Africa are predicted to double in the next decade. The report also outlines many instances where non-consumptive wildlife tourism revenues benefit local communities, and where those communities have been encouraged to protect wildlife for non-consumptive purposes. Examples include the development of birding tourism in South Africa which has been promoted by community projects supported by NGOs from the tourism sector and has encouraged the development of many small service businesses along birding routes; mountain gorilla viewing tourism in the Bwindi Forest National Park in Uganda; the Kichwa Tembo Masai Mara Tented Camp in Kenya; and turtle watching tourism in many coastal areas.  Claims relating to job creation seem to assume that all of the people who provide services to hunters would not be employed without the income those hunters bring. This might be true for the relatively small number of people	Thank you for your comment. Please note, the section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.

140	Freyer, Daniela	4	22	738	23	785	A considerable number of reports question the narrative of trophy hunting as an effective tool for conservation as well as its socio-economic benefits. Many reports document that revenue from hunting is not at all or only insufficiently distributed to communities living with wildlife: "The socioeconomic contribution and the contribution to development of big game hunting is virtually nil. ... Such low benefits do not motivate local communities. Therefore it is in their "interest" not to respect the hunting area boundaries and to poach." (IUCN, 2009: Big game hunting in West Africa: what is its contribution to conservation? <a href="https://www.iucn.org/content/big-game-hunting-west-africa-what-its-contribution-conservation">https://www.iucn.org/content/big-game-hunting-west-africa-what-its-contribution-conservation</a> ). "By spending a mere 2% of the required amount, Tanzanian trophy hunters have not been able to maintain biodiversity in those areas. Total revenue generated by the 200,000 km2 of hunting areas in Tanzania is US\$30 million per annum, whereas the conservation cost for that land, if done correctly, would be US\$150 million per annum. When it comes to contributions to local communities, the average trophy hunting operator in Tanzania spent US\$0.08 per hectare per year, compared with tourism concessions in Kenya's Maasai Mara paying US\$40 per hectare per year – without counting the redistributions linked to entry fees and employee salaries. Moreover, the amount collected from Tanzanian trophy hunting operators were not all used in Tanzania, as highlighted in the Panama Papers financial scandal, which underlined the poor governance of this sector." (summary of Chardonnet, 2019 below in <a href="https://africageographic.com/blog/trophy-hunting-africa-decline-no-longer-pays-way/">https://africageographic.com/blog/trophy-hunting-africa-decline-no-longer-pays-way/</a> ) Other suggested references : Chardonnet, B., 2019. Reconfiguring the protected areas in Africa. IUCN PAPACO. <a href="https://africageographic.com/wp-content/uploads/2019/03/etudesAP_configAP_EN.pdf">https://africageographic.com/wp-content/uploads/2019/03/etudesAP_configAP_EN.pdf</a> ; „Nature based tourism does play a significant role in national development, but trophy hunting is insignificant. Across the investigated countries, trophy hunting revenue was only 1.8% of tourism revenues." (Campbell, R., 2013. The \$200 million question: How much does trophy hunting really contribute to African communities?, a report for the African Lion Coalition, prepared by Econmists at Large, Melbourne, Australia. <a href="http://www.eclarge.com/wp-content/uploads/2013/06/Eclarge-2013-200m-question-FINAL-lowres.pdf">http://www.eclarge.com/wp-content/uploads/2013/06/Eclarge-2013-200m-question-FINAL-lowres.pdf</a> ) ; „Trophy hunting has had negative effects on lion populations throughout Africa" Creel et al. (2016) Assessing the sustainability of African lion trophy hunting, with recommendations for policy. Ecological Applications. doi: 10.1002/eap.1377 ; „Trophy hunting appears to have been the primary driver of a decline in lion abundance in the country's trophy hunting areas and is likely affecting lion abundance in Katalavi National Park and possibly Tarangire National Park. ....We lacked independent estimates for leopard population trends, but trophy hunting may have similarly driven a decline in leopard abundance in several areas outside Selous." Packer et al.(2009): Sport Hunting, Predator	The statement was made with reference with some of the highly reputed publications over the last decade. However, the section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
141	Germany	4	22	753	22	764	The picture painted about trophy hunting in this box is not very balanced. There are more aspects that should be taken into consideration besides purely economic ones. It may be useful to add ethical, cultural [and post-colonial] perspective: <a href="https://onlinelibrary.wiley.com/doi/pdf/10.1111/conn.12565">https://onlinelibrary.wiley.com/doi/pdf/10.1111/conn.12565</a> Its important to take different form of valuing into account.	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
142	Kathryn Phillips (on behalf of UNEP - WCMC)	4	22	738	24	824	Again hard to see the distinction in focus of this section vs that on the same topic in chapter 3 - albeit this version is rather better written. Suggest combining and removing from this section as drivers are not discussed here. Claire/Becky to review re' current and proposed use of CITES data in analysis of trends in trophy hunting.	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
143	Kathryn Phillips (on behalf of UNEP - WCMC)	4	22	738	24	824	In general section on economic impacts of hunting trophies seems very one-sided, it doesn't explore the potential negatives or the mechanisms by which revenue is gained by local communities. For example, Lindsey et al 2007 notes that "Despite some successes, local communities living in or near wildlife rarely benefit adequately from trophy hunting activities" whereas in the chapter it states "In many parts of world, particularly in the rural areas, this arguably contributes to the well-being of local communities and thus, act as an economic incentive for conservation (established but incomplete)" without a reference. This needs a reference at the very least, but much more balanced evaluation of pros/cons needed.	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
144	Kathryn Phillips (on behalf of UNEP - WCMC)	4	22	751	22	752	Noting that trophy hunting is legal in the US and Canada seems a broad statement, is this truly the case for all species in these countries? Does it in fact mean that imports of trophies into the US and Canada are legal, as the second part of the paragraph is referring to imports? Need reference for the fact that the US is 'the highest importer of trophies from across the world.' Is this based on CITES trade data? Or another dataset?	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
145	Kathryn Phillips (on behalf of UNEP - WCMC)	4	22	747	22	747	Typo - 'countries' should be 'country'	has been changed
146	Meera Anna Oommen	4	22	section on trophy hunting	NA	NA	Please add recent references such as Dickman et al 2019 (Trophy hunting bans imperil biodiversity. <i>Nature</i> ).	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
147	Kathryn Phillips (on behalf of UNEP - WCMC)	4	23	786	24	803	Figure 4.4. - only 18 species included at present not 20. Not currently clear what this figure is based on. Is it data from the CITES Trade Database? If so, citation should be: CITES trade statistics derived from the CITES Trade Database, UNEP World Conservation Monitoring Centre, Cambridge, UK . Data for 2018 is incomplete (reporting deadline 31/10/2019) and as such 2017 data should be considered most recent year of complete data. 11 year time frame (2008-2018) seems unusual. Also not clear whether this is based on exporter or importer reported data, direct trade data only? Worth noting that the reporting of hunting trophies in CITES annual reports is inconsistent and therefore is much more nuanced than just trade reported as term 'trophy'. For example trade is also reported in the separate trophy items (e.g. 'one skin and one skull') and so conversions to whole equivalent trophies need to be applied (e.g. 4 feet = 1 tro, 1 sku = 1 tro). See Sinovas et. al. 2016 Southern Africa's wildlife trade: an analysis of CITES trade in SADC countries for details of such conversion factors. Also trophy trade is also reported for purpose personal (P) and commercial (T) in the CITES Trade Database so these factors must all be considered to avoid significantly underrepresenting the trade. Choice of figure is strange, alluvial diagrams imply a flow between two categories (for example export country to import country) - does not work with this data. Also not sure why <i>Loxodonta africana</i> is only going to App I while it is a split-listed population and most trade is from the App II pop. Are the size of the sections proportional to the trade? Failed to recreate figure - clearer details on what parameters have been included nessecary.	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
148	Kenward, Robert	4	23	786	23	801	What are the y and x axis labels on Figure 4.4?	This figure has been removed in the SOD
149	López-Castro, Melania	4	23	798	23	801	The description of this graph needs clarification, especially in cases where the same species ( <i>Caracal caracal</i> ) is listed in both appendix I and appendix II. Does the thickness of the lines mean something? What about the direction of the lines?	Sorry for the confusion. It didn't mention an increase tree coverage in the tropics. It reads as Globally tree cover has increased by 2.24 million km2 (7.1% relative to the 1982 level) during the period 1982-2016 as a result of a net loss in the tropics being outweighed by a net gain in the extratropics (Song et al., 2016).

150	Muła, Anna	4	23	776	23	777	There should be more data about trophy hunting as there does not appear to be consensus among stakeholders as to whether trophy hunting is being applied and used as an effective conservation tool throughout range countries where it is practiced. See International Trophy Hunting report by Congressional Research Service, March 20, 2019. Trophy hunting does not have the significant effect on gross domestic product (GDP) that supporters claim. An analysis of the existing literature on trophy hunting economics shows that communities that live in the vicinity of these hunting grounds obtain very little of this income, according to one study Roderick Campbell, The \$200 Million Question: How Much Does Trophy Hunting Really Contribute to African Communities?, report prepared by the Economists at Large for the African Lion Coalition, February 2013. Trophy-hunting revenue remains a small percentage -1.8%,- of overall tourism revenues and just a fraction of overall GDP for some of the core wildlife source countries in Africa.	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
151	Adeline Lerambert	4	24	804	44	805	Why utilise such old data when much more up-to-date data is available? in the decade from 2008 and 2017, a total of almost 290,000 trophy items derived from almost 300 different animal species listed on the CITES Appendices were exported or re-exported from 119 countries, and were destined to 165 importing countries. Exports by just five countries (South Africa, Canada, Mozambique, Namibia and Zimbabwe) accounted for almost 80% of the items. The United States was the declared destination for approx. 42% of all exports, with European Union Member States accounting for a further 27%. The most commonly exported trophies were derived from Nile crocodiles (55,689), American black bears (49,555), African elephants (37,933), and hippopotamus (27,972). CITES trade statistics derived from the CITES Trade Database, UNEP World Conservation Monitoring Centre, Cambridge, UK. Search conducted in March 2018 for exports associated with Purpose Code 'H' (Hunting Trophy), excluding items declared by weight or volume	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
152	Jungwittanaporn, Megan	4	24	825	25	861	Section 4.2.2 "Management of Wild Species" has a sub-section on fishing. Currently there is no reference to Regional Fisheries Management Organizations (RFMOs) and the role they can play in the management of wild species. RFMOs could play an essential role in limiting overfishing through adopting effective harvest strategies, implementing compliance regimes, addressing bycatch, and other methods. There is also no mention of CITES in the fishing section, although CITES can be used in the sustainable management of fishing and CITES is mentioned in other sections.	Thank for your comment. I agree with these remarks. The paragraphs on fishing and the exploitation of aquatic resources (continental, coastal and marine) need to be reworked in the next drafts.
153	Kathryn Phillips (on behalf of UNEP - WCMC)	4	24	826	25	861	Section seems more relevant re' interaction between drivers and impacts on sustainability of resource use	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
154	Kenward, Robert	4	24	808	24	824	Box 4.3 is based on a small proportion of the available literature and gives a totally unacceptable negative bias to the whole story. It needs much revision by experts in the field.	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
155	Le Pape Olivier	4	24	825	25	861	4.2.2.1.2. Fishing. To my opinion, this chapter reflect a restricted point of view from a restricted community of scientists. "The current trend in decreasing catches, largely due to overfishing" does not reflect the reality of the steadiness of catches worldwide. Nevertheless there is an increasing overexploitation worldwide, I agree. This is in link with the next sentence "we may be approaching the physical limits of expansion in capture fisheries". Indeed we had already reached the fisheries capacity and the catches are not yet increasing. In the same way, "the rapidly growing proportion of marine primary productivity being redirected to human consumption" reflect a trend on the last decades and not the present situation. I suggest to present an assessment more based on FAO (2019) with an almost general agreement of the scientific community	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
156	Baker, Michael	4	25	838	25	839	"...but in part to climate change" consider including other environmental pressures such as eutrophication...	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
157	CAMARENA, Maria	4	25	826	28	959	Complement this sections with CITES Secretariat's most recent overview on NTFP, found here: <a href="https://cites.org/sites/default/files/eng/cop/18/doc/E-CoP18-055.pdf">https://cites.org/sites/default/files/eng/cop/18/doc/E-CoP18-055.pdf</a>	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
158	Doering, Ralf	4	25	838	25	848	This is a very one-sided statement and is not covering the overall scientific knowledge/assessment. I agree that there are parts of the world with decreasing catches due to overfishing but in some parts of the world reduction of fishing effort to rebuild stocks also led, at least at the beginning, to lower catches (e.g. in the EU). Then it is an effect of fisheries management and not simply overfishing.	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
159	Doering, Ralf	4	25	849	25	849	This is not in line with Chapter 3. There it is rightly stated that the FAO classification of 'fully sustainably exploited' does not mean that we have a problem. It is fishing at the management target of 'Maximum Sustainable Yield'.	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
160	SONALI, GHOSH	4	25	862	25	862	Title may be changed from NTFP to Minofr forest Produce (MFP)	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
161	Ehara, Makoto	4	26	873	26	876	As a supporting reference to the importance of NTFPs for the subsistence of residents in developing countries in terms of supplement diets and income, and to meeting their medicinal needs, following study can be cited: Ehara et al., 2016. Identifying characteristics of households affected by deforestation in their fuelwood and non-timber forest product collections: Case study in Kampong Thom Province, Cambodia, Land Use Policy, Volume 52, 2016, Pages 92-102, <a href="https://doi.org/10.1016/j.landusepol.2015.12.006">https://doi.org/10.1016/j.landusepol.2015.12.006</a> .	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
162	Pilling, Dafydd	4	26	893	26	893	The figure does not seem to have any kind of "call" in the main text. If it is to be used it needs some kind of introduction including caveats with regard to coverage.	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
163	Kujirakwinja, Deo	4	28	975	28	975	Check reference Bawa & Seidler	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
164	Jungwittanaporn, Megan	4	29	982	29	1014	Section 4.2.2.1.5 "Extraction of materials derived from aquatic ecosystems" does not mention other marine species parts like shark teeth or jaws that are commonly used in handicrafts and jewelry.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
165	Kathryn Phillips (on behalf of UNEP - WCMC)	4	29	982		1072	This section seems strange - Lines 1015-1022 relate to the use of wild animals as pets/companionship, but then lines 1023-1072 seem to just be a summary relating to general trade in CITES listed species. This doesn't seem to fit here, and the vast majority of the information is based on one source which was produced in 2012 and therefore would only have had access to 2010 data at the latest. This sort of general summary of stats on wildlife trade would be better placed in Chapter 3 (perhaps in the taxonomic groups section? 3.17) on status and trends, but strongly suggest it is updated to reflect recent data from the CITES Trade Database or removed.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
166	Kenward, Robert	4	29	1010	29	1014	Unrepresentative because the majority of use would not have been covered by CITES; again, the section is supposed to be about drivers, not merely description of trade.	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
167	Adeline Lerambert	4	30	1023	30	1027	This information should be updated	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
168	Adeline Lerambert	4	30	1035	30	1072	Worth updating this data. Eg CITES live trade in 2017: 45k transactions on the database that involved live animals 2.2 million reptiles 587,000 birds 53,000 mammals 47,000 amphibians Also, reference should be made to the morbidity/mortality involved in live trade and the additional pressure this places on wild populations as more animals are collected to replace mortalities, alongside the extensive laundering of wild-caught animals as captive-bred	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.

169	Fisher, Sue	4	30	1035	30	1035	Please refer to capture for commercial display (zoos and aquaria). The capture hotspots for cetaceans in 2019 are Russia (belugas and orcas) and Japan (multiple dolphin species). The principal market today is China, where the number of ocean theme parks has jumped from 39 in 2015 to 76 in early 2019. See: Rose, N.A. and Parsons, E.C.M. (2019). The Case Against Marine Mammals in Captivity, 5th edition (Washington, DC: Animal Welfare Institute and World Animal Protection), 160 pp.	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
170	Freyer, Daniela	4	30	1038	30	1039	For a more recent analysis of CITES bird Trade data see: REINO, L.; FIGUEIRA, R.; BEJA, P.; ARAUJO, M.; CAPINHA, C. & D. STRUBBE (2017): Networks of global bird invasion altered by regional trade ban. Science Harr3(11): e1700783	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
171	Freyer, Daniela	4	30	1025	30	1033	General comment on Line 1025-1033: The data on the value and the volume of wildlife trade both seem rather outdated, given that meanwhile data are available in the CITES trade database up to 2018 (see <a href="https://trade.cites.org/">https://trade.cites.org/</a> ) and that a lot of literature has been published on this issue in recent years, with illegal and unsustainable wildlife trade coming increasingly under the radar, including at high political level. Suggestions for further review and references include: The UN General Assembly has meanwhile adopted 4 resolutions on illegal wildlife trade, the last in Sept. 2019: <a href="https://undocs.org/A/73/L.120">https://undocs.org/A/73/L.120</a> ; the EU has established an Action Plan against Wildlife Trafficking (2016-2020) <a href="https://ec.europa.eu/environment/cites/pdf/WAP_EN_WEB.PDF">https://ec.europa.eu/environment/cites/pdf/WAP_EN_WEB.PDF</a> inter alia acknowledging its role as a major consumer for certain wildlife products and live animals traded as pets, such as reptiles and the need for measures to address unsustainable as well as illegal trade in these.	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
172	Freyer, Daniela	4	30	1035	30	1047	Note: While the title of this part of the chapter refers specifically to the use of wild animals as pets (live animals), there are a number of references to trade in parts and derivatives of wildlife for other consumptive uses (such as the skin trade).	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
173	Freyer, Daniela	4	30	1018	30	1018	Suggestion for this to read: "Because of the sometimes (suggest to insert "sometimes" as otherwise the false impression is created that all trade in wildlife as pets is illegal, which it is clearly not, even if there is a large grey area. This is mostly because requirements applying to CITES protected species, such as legal acquisition findings and non-detriment-findings are not made and loopholes permitting trade in alleged captive-bred specimens are exploited for laundering wild ones. This is making it difficult to distinguish between legal and illegal trade).	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
174	Freyer, Daniela	4	30	1031	30	1031	Suggestion to add the following: "However various studies and ongoing debates within CITES raise serious concerns towards the accuracy of the reported source of animals, with frequent reports that wild animals are laundered into trade claiming they originate from captive production (see references below on trade.)	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
175	Freyer, Daniela	4	30	1023	30	1023	Suggestion to replace "legislation" with "Convention" – CITES decisions must be enacted through national laws in order to become legislation.	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
176	Freyer, Daniela	4	30	1036	30	1036	The trade in ornamental fish is even bigger than the bird trade, however hardly any trade data is available, due to the fact that very few fish species are listed by CITES (see: <a href="https://cites.org/sites/default/files/eng/cop/18/inf/E-CoP18-Inf-069.pdf">https://cites.org/sites/default/files/eng/cop/18/inf/E-CoP18-Inf-069.pdf</a> )	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
177	Kathryn Phillips (on behalf of UNEP - WCMC)	4	30	1022	30	1022	Bush et. al 2014 is referenced here relating to estimating trade patterns of birds, mammals and reptiles in terms of pets and companionship. However this paper is flawed as it only considers trade for personal purposes from the CITES Trade Database. In general, live trade for this purpose is likely to represent relocation of pets, rather than live animals destined for the pet trade which is more likely to be captured by looking at trade in live animals for commercial purposes.	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
178	Le Pape Olivier	4	30	1015	31	1072	4.2.2.1.6 Use of wild animals as pets and for companionship. This chapter could also mentioned fish catch for aquarium (illegal fishing sometimes with coral reef fish)	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
179	Freyer, Daniela	4	31	1060	31	1060	Please see list of references below on concerns about the reliability of source codes reported in the CITES trade database – specifically for reptile and amphibian species. Because of these concerns, CITES has meanwhile established a number of guidelines, tools and most importantly a compliance mechanism, the "Review of trade in animal specimens reported as produced in captivity", see <a href="https://www.cites.org/eng/prog/captive-breeding">https://www.cites.org/eng/prog/captive-breeding</a>	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
180	Jia, Gensuo	4	31	1073	34	1170	It's unclear why there is not mention of mitigation here and only in the biofuel expansion. This is important since the feedback to the sustainable use of wild species could be strong (and not just in terms of the biofuel expansion strategies)	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
181	Kathryn Phillips (on behalf of UNEP - WCMC)	4	31				section 2.2.1.5 biofuels - great material but risks documenting threats and states without relating to the discussion of drivers of sustainable use clearly ... similar for most sections in 4, a lot of the information and status reporting could move to chapter 3 within sections on what is used and how it is extracted, then leave details of drivers of use/practices and discussions of sustainability for 4 ...as proposed to be in chapter outlines?	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
182	Kenward, Robert	4	31	1073	35	1193	Is biofuel/palm-oil production sustainable use of wild species? It may impact wild species, but is surely not a driver of sustainable use. The relevant aspect can be covered very concisely, based on 1157-1162 and 1179-1193. This analysis is useful, but would probably be better in regional reports or even as an IPBES report on biofuels and natural oil products.	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
183	López-Castro, Melania	4	31	1056	31	1057	The sentence in this line seems incomplete, please review.	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
184	Saw Leng Guan	4	31	1073	31	1073	The main use of palm oil is not in biofuel but rather its edible oil. This is also true for some of the other commodity listed in this section. A better heading would be Commodity crop expansion. How they are used would then be a matter differentiated later, edible oil, feedstock, even biofuel etc.	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
185	Timoshyna, Anastasiya	4	31	811	35	914	This chapter need a thorough review, and additional, balanced case-studies. I can offer these as a specialist on medicinal plants trade and use <a href="https://www.traffic.org/what-we-do/species/wild-plants/">https://www.traffic.org/what-we-do/species/wild-plants/</a> and co-chair of the IUCN SSC Medicinal Plant Specialist Group; At the moment gathering/NWFP/NTFP is in-consistent across chapters 2, 3, 4, 5, 6	It will be great to have your contribution as CA to help provide some insight and case studies related to wild medicinal plants trade in our chapter. We will definitely benefit from your expertise as a specialist on medicinal plants trade and use. We will get in touch with you to see how we can cooperate in that regard.
186	Germany	4	34	1168	34	1170	Please cross-check: The cited source from 2008 does not seem to be an adequate reference for the development "over the past 3 years".	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
187	Germany	4	35			38	4.2.2.2 is somehow incoherent. It does not become clear for what reason the four types of ontology are introduced. Also, the framework for values systems seems out of place. There is a lengthy elaboration on sacred sites which makes one wonder if that is the only kind of endogenous management approach. We encourage the authors to revisit this section and expand their discussions.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
188	Germany	4	35	1178	35	1193	It is appreciated that knowledge gaps are pointed out. However, it should be done consistently throughout the ch/ assessment.	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
189	Jia, Gensuo	4	35	1178	35	1178	Please modify "4.2.2.1.5.1." to "4.2.2.1.6.1."	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
190	Le Pape Olivier	4	35	1178	35	1178	4.2.2.1.5.1. Knowledge gaps and Policy options. No 4.2.2.1.5.2	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
191	Kujirakwinja, Deo	4	36	1208	36	1210	Should the authors consider the relational modes, <a href="https://link.springer.com/article/10.1007/s11625-019-00718-4">https://link.springer.com/article/10.1007/s11625-019-00718-4</a>	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
192	SONALI, GHOSH	4	37	1236	37	1236	Title may be changed..are these referring to cultural values ?using different terminologies to convey the same meaning may be confusing	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
193	ʃ Sas-Rolfes, Michael	4	38	1301	39	1308	The distinction here between formal and informal institutions is not technically correct. I recommend referring to North (1991) for correct definitions: (North, D.C., 1991. Institutions. The Journal of Economic Perspectives 5, 97–112). <a href="http://www.jstor.org/stable/1942704">http://www.jstor.org/stable/1942704</a>	Such comments on the definition and distinction of formal and informal institutions will be addressed in the revised version.

194	Kathryn Phillips (on behalf of UNEP - WCMC)	4	38	1298	38	1299	Good approach to section - other previous sections could benefit from a clearer and similar outlining of the purpose and adoption of the section purpose (ie. How do various drivers act to change uses of wild species and how to what end re' sustainability) although would say the section only partially achieves this, greater detail on actual outcomes for sustainable use are needed and less broad lit reviewing.	The CLAs will ensure that such an outline be provided at the beginning of each section.
195	Kujirakwinja, Deo	4	38	1287	38	1299	Need references for institutions and governance systems: e.g., Berkes, Fikret & Marschke, Melissa & Clark, Douglas. (2005). CROSS-SCALE INSTITUTIONS & BUILDING RESILIENCE IN THE CANADIAN NORTH.	Thank for your comment. Reference well taken.
196	SONALI, GHOSH	4	38	1286	38	1286	again is there a thing like political drivers. We may be consistent with past assessments (eg global and regional assessments) where key drivers for biodiversity change have been assessed	If I understand correctly, the experts involved with this assessment are aware of the drivers used in previous assessments but have decided not to use them. The assessment itself is being re-structured, but the political drivers will remain.
197	SONALI, GHOSH	4	38	1274	38	1274	exogenous or co-maangeemnt for non-extractive uses is highly confusing	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
198	't Sas-Rolfes, Michael	4	39	1325			Technically incorrect to say that 'institutions' have led to the demise of elephants. Suggest rewording this.	Noted, the revised version will nuance the use of the example of elephant population in Africa as an example of failing institutional arrangements.
199	Germany	4	39	1305	39	1307	Formal institutions are not only represented by physical structures, but also by people, written laws, legal processes etc.	A wider definition of formal institutions will be considered
200	Kathryn Phillips (on behalf of UNEP - WCMC)	4	39	1309	39	1309	Here terms re formal and informal governance start to be used when endow' and exog' were introduced earlier. Whilst would suggest formal/informal is more appropriate (and the discussions on exog etc is not necessary earlier ...) should at least be consistent or explain the difference in intended use?	Endogeneous / exogeneous has been removed.
201	Kathryn Phillips (on behalf of UNEP - WCMC)	4	39	1316	39	1335	In general would be useful to unpack these paragraphs and dig into some of the examples where institutional arrangements have added to sustainable use or not ... isn't this the point of the assessment? It feels rather swept over in this section whilst heavy on broad review elsewhere where its less relevant.	Good point. We will work on this.
202	Kathryn Phillips (on behalf of UNEP - WCMC)	4	39	1316	39	1326	Urge caution re this statement 'demise of elephants in Africa' as a result of failing institutional arrangements. Elephant populations are thriving in some parts (jurisdictions) in Africa (e.g., southern and somewhat eastern) and less so in others (West/Central)... it would be a useful case study in fact to dig into the institutional arrangements that sit alongside these differences, but we definitely cannot sweep the continent-wide population status under this statement re' failing governance and their demise. Please dig into references and ensure they are relevant to different geographical and political areas which match the species conservation status.	Noted, the revised version will nuance the use of the example of elephant population in Africa as an example of failing institutional arrangements.
203	't Sas-Rolfes, Michael	4	40	1336			Table 4.1 I suggest inserting the word 'Formal' before Institutions in column two heading.	The word "formal" was inserted in the column two heading.
204	Baker, Michael	4	40	1336	40	1336	Consider including 1982 UNCLOS and supportive 1995 Fish Stocks Agreement	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
205	Doering, Ralf	4	40	1336	40	1336	In the table some fisheries agreements are missing, including the United Nations Convention on the Law of the Sea which introduced MSY as management target.	Will include example of UNCLOS and FAO code of conduct (perhaps others if needed) that name MSY as a target
206	Kathryn Phillips (on behalf of UNEP - WCMC)	4	40	Table 4.1			Should this not be in Chapter 6?	Thank you for your comment. We believe this label is relevant for chapter 4.
207	Kathryn Phillips (on behalf of UNEP - WCMC)	4	40		42		table. 4.1. Not clear why some (major - subjective?) implementing/regulatory gov/non-gov initions are included alongside conventions and agreements. I would remove.	Thank you for this suggestion. We have chosen not to delete it from the assessment, as you have not provided any supporting evidence for this specific approach and it does seem to be suggested elsewhere.
208	CAMARENA, Maria	4	42	1355	42	1356	This reference to CITES is incomplete, and not reflective of the role that CITES plays in ensuring the sustainable trade of more than 36,000 wild species of fauna and flora. Particularly, the fact that CITES listings have triggered the development of sustainable harvest and trade protocols, to ensure the long-term survival of species listed in the Appendices. In fact, CITES could be included as a "box" example on success stories of sustainable international trade.	Note: Dan Challander is a CA for this chapter that will be contacted once the chapter is re-organized to provide a more thorough analysis on CITES
209	Germany	4	42	1355	44	1356	Text on CITES seems to be missing. Reasoning of importance to sustainable use under CITES should be added.	Note: Dan Challander is a CA for this chapter that will be contacted once the chapter is re-organized to provide a more thorough analysis on CITES
210	Kathryn Phillips (on behalf of UNEP - WCMC)	4	42	1338	42	1369	Given that CITES is the major governance mechanism for sustainable use of species in trade I would have expected to see a great deal more discussion of it's role. There is one passing sentence nodding to it. Trade for both commercial and non-commercial use likely underpins nearly every use category identified, but is little discussed elsewhere or here as a driver - which is very surprising. Assume/hope there are plans to expand this section at least in later drafts?	Thank for your comment. The CITES section will be increased in the next version of the draft.
211	Kenward, Robert	4	42	1366	42	1366	which "country"?	The sentence has been completed.
212	Tonon, Kylie	4	42	1338	42	1340	This Chapter highlights CBD and CITES as key agreements that promote the sustainable use of wild species. I'm not sure if 'promoting' should be used here as they don't promote the use of species. I suggest something like 'governing' the sustainable use of wild species is more appropriate.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
213	Zisenis, Marcus	4	42	1355		1356	Will more detail on CITES be provided here as was done with the CBD in the paragraph above? Realizing that CITES is explained in greater detail elsewhere in the report, the basic goal of CITES should be noted here.	Note: Dan Challander is a CA for this chapter that will be contacted once the chapter is re-organized to provide a more thorough analysis on CITES
214	Doering, Ralf	4	43	1416	43	1416	There are many examples of good or bad governance in the management of fisheries/marine ecosystems. I think it would be beneficial if a person familiar with this takes part in the assessment. So far there is only the last sentence of ch. 4.2.3.5 which covers this a bit (Lines 1520-1522).	Will expand on these examples as part of enhanced focus on fisheries together with Andries
215	Lafaye de Micheaux Flore	4	43	1471	43	1471	It would be useful to add here (or earlier within the sub-section 4.2.3.1, or within the sub-section 4.2.3.3) a sub-section addressing the role of donors, NGOs, and IUCN as driving sustainable use. The role of the IUCN Resolutions and Recommendations would be particularly valuable to consider (see for instance Resolutions WCC 2004 RES 074, WCC 2008 RES 093, WCC 2016 Res 044 and Recommendations GA 1990 REC 025, GA 1994 REC 021, WCC 2000 REC 092, WCC 2004 REC 093, WCC 2012 Rec 179. all available at <a href="https://portals.iucn.org/library/resrec/search">https://portals.iucn.org/library/resrec/search</a> ). See also Ch.6 pages 43-45 in this regard.	We have added a box with references from the peer-reviewed literature addressing this point.
216	Germany	4	44	1417	44	1419	3.5 defined governance as "interrelated and increasingly integrated system of formal and informal rules, rule-making systems, and actor-networks at all levels of human society (from local to global) that are set up to steer societies toward preventing, mitigating, and adapting to global and local environmental change" (Biermann et al. 2009: 4). We encourage the authors to please make sure that definitions used in different ch align with each other and that the same definitions are used throughout the assessment.	Definition adapted.
217	Germany	4	44		46		Many paras and statements in 4.2.3.5 an 4.2.3.5 lack references. We encourage the authors to include references to strengthen the evidence of statements.	Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.
218	Kathryn Phillips (on behalf of UNEP - WCMC)	4	44	1409	44	1415	Good example but what is the outcome re' sustainable use? How do these arrangements play out for reindeer management? What does it tell us about ways to consider achieving sustainable use into the future?	Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.

219	Kenward, Robert	4	45	1450	45	1462	The (developing?) regions to which this refers need to be stated. What about other regions, e.g. Europe and North America?	Comment does not correspond to the lines mentioned
220	White, Michael	4	45	1474	45	1477	True, and often worsened when a remote government gets involved (especially for electoral reasons)	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
221	Ehara, Makoto	4	46	1496	46	1499	Needs much more references in addition to "Bakers" for supporting the argument " Issues need to be considered simultaneously at several scales when there is coupling or interaction between scales". As one of the references following study can be cited: Ehara et al., 2019. Addressing Maladaptive Coping Strategies of Local Communities to Changes in Ecosystem Service Provisions Using the DPSIR Framework, Ecological Economics, Volume 149, 2018, Pages 226-236, <a href="https://doi.org/10.1016/j.ecolecon.2018.03.008">https://doi.org/10.1016/j.ecolecon.2018.03.008</a> .	Reference has been added.
222	Germany	4	47	1549	47	1554	Another indirect effect hampering conservation is caused by instability in regions which leads to a reduction in financial flows such as ODA.	Thanks for this suggested change. We have included it in the new version.
223	White, Michael	4	47	1546	47	1548	Or for fun! Israeli Defence Forces shooting sea turtles in Palestine to alleviate boredom	This comment seems an opinion instead of a statement backed up by research
224	Kujirakwinja, Deo	4	51	1664	51	1667	Authors should consider also migration for fertile and accessible land... see for example Crawford & Kujirakwinja on the migration and environment in Kabobo <a href="https://www.iisd.org/library/migration-and-conservation-in-misotshi-kabogo-ecosystem">https://www.iisd.org/library/migration-and-conservation-in-misotshi-kabogo-ecosystem</a>	Thanks for this suggested change. We have included it in the new version.
225	Germany	4	54	1797	55	1812	This is an exact repetition of para 1693, p. 52.	Thanks for this suggested change. We have included it in the new version.
226	Kathryn Phillips (on behalf of UNEP - WCMC)	4	55	1818	55	1822	section 4.2.4.1.5 shame this is not yet written as the crux of the section. Prior literature review is interesting but needs balancing with this important discussion.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
227	Kathryn Phillips (on behalf of UNEP - WCMC)	4	57	1860	1874	58	this section doesn't really discuss poverty and use of species ..it starts to, but could benefit from expansion and examples?	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
228	Ehara, Makoto	4	58	1893	58	1896	As a supporting evidence for "a lack of assets and access to other forms of labor, markets, and livelihoods limit peoples' options to the use of common resources that may have already been substantially depleted by historical industrial processes", following study can be cited : Ehara et al., 2016. Identifying characteristics of households affected by deforestation in their fuelwood and non-timber forest product collections: Case study in Kampong Thom Province, Cambodia, Land Use Policy, Volume 52, 2016, Pages 92-102, <a href="https://doi.org/10.1016/j.landusepol.2015.12.006">https://doi.org/10.1016/j.landusepol.2015.12.006</a> . This study showed that among people who lost income from NTFP collection owing to deforestation, those without income sources other than farming tended to be more affected by deforestation.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
229	Germany	4	58	1875	58	1898	In this context an analysis of the link between inequality and the unsustainable use of wild species may be worthwhile.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
230	Kathryn Phillips (on behalf of UNEP - WCMC)	4	58	1904	58	1904	Not clear if a section on the drivers of marginalisation is necessary - more relevant is the impact of marginalised populations on the use of wild species - mitigating solutions might address/consider such drivers but not what this section is about?	Thank you for your comment. It is difficult to address issues of marginal populations without first defining what is meant by marginalization (same for poverty). indicators are not only quantitative
231	White, Michael	4	58	1906	58	1909	It is worth considering being 'money poor but resource rich' (OK you mention this below)	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
232	White, Michael	4	58	1899	58	1903	More likely through greed	Thank you for this suggestion. We have chosen not to include it in the assessment, as you have not provided any supporting evidence for this specific approach and it does seem to be suggested elsewhere.
233	Germany	4	59	1930	59	1935	The para on shellfish harvesters seems oddly detached from the rest of this section. Authors may wish to consider presenting it as a case study in box?	Thank you for your comment. Point well taken
234	Baljinder Singh	4	60	1969	60	1969	I was glad to see that the report included some discussion on shrimp farms, & their connection to losses of mangroves in Latin America & South East Asia but this must be expanded in future versions.	Thank you for your comment. Point well taken
235	CAMARENA, Maria	4	60	1952	60	1986	This case study needs to give recognition to the status of Vicuña in CITES Appendices, and the role that these listings have had in the recovery of vicuña wild population. There are several CITES-led documented success stories of Vicuña, and these should be acknowledged. At the last CoP18 (Geneva, 2019) some amendments to the listings of Vicuña were adopted, so please include the reference to the new amended CITES Appendices which will enter in force in 26 November 2019.	Thank you for your comment. Vicuña as a case study might be used along the report. The status of vicuña in CITES Appendices and the role of these listings in the recovery of the species will be mentioned either in this section or elsewhere. Given that we are word limited the information that was not crucial for this particular section (such as amendments to the listings) was not included.
236	Baljinder Singh	4	61	1999	61	2006	The section on the enrichment, via shrimp seed harvesting, of marginalized women & others in the Sundarbans is a useful addendum to the socio-ecological challenges at play in many of the poorest regions of the world. It might be worthwhile to examine some recent reporting, by The Guardian, on challenges facing these aquaculture industries in the Sundarbans ("With rising seas swallowing Bangladesh's land and kidnappings a regular hazard, families scraping a living farming crab and shrimp in one of the world's largest mangrove forests are fighting to survive"; by Kate Lamb and Ali Ahsan in Khulna; 18 Oct 2019; GUARDIAN).	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
237	Kathryn Phillips (on behalf of UNEP - WCMC)	4	61	2013	63	2101	interesting section on education etc but not sure if this chapter is the place for it? Rather feels it should be part of a discussion around solutions and responses?	Thank you for your comment. Considering that the structure of the Table of Contents is going to change, the topic of Education and awareness will move to another section (Science, Technology and Education) and will include case studies highlighting education and extension as key mitigating factors. Education will likely also be mentioned in the Conclusions and Recommendations section
238	Kathryn Phillips (on behalf of UNEP - WCMC)	4	61	2007	61	2012	is a two sentence section on policy responses meaningful here?	Thank for your comment. Point well taken.
239	Germany	4	64	2103	64	2113	The binary definition of gender in this para is in itself a social-construction as there exists a variety of non-binary gender identities which should not be ignored by an IPBES assessment.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
240	Skern-Mauritzen, Mette	4	65	1497	65	1509	Please base text in more recent literature, and assess uncertainties in projections in studies like e.g. Worm et al 2006	This comment refers to chapter 5, I believe.
241	Kathryn Phillips (on behalf of UNEP - WCMC)	4	67	2211	84	2815	I think this section could be strengthened by recognising that there are issue around the supply and demand for wildlife / wildlife related products. It could then be organised around influences on / drivers of supply and demand for species (including 'competition' for how species are used i.e. consumptive uses vs tourism), and then it could discuss management systems for balancing supply and demand (i.e. local management, subsistence use, indigenous use, up to more regulated markets which supply global supply chains). At the moment, the section doesn't flow particularly logically, the grounding this in supply and demand might help give a clearer narrative.	Good idea. We have rewritten the section.
242	Kathryn Phillips (on behalf of UNEP - WCMC)	4	67	2220	67	2227	To illustrate the point above - the first half of this paragraph is about drivers of demand and the second half about impacts on supply - I think using the words supply and demand and thinking about what drives each in the context of wildlife products would be helpful.	We have incorporated supply and demand in that paragraph.

243	Germany	4	68	2258	68	2258	The section "trade data on species considered not endangered under CITES" should be amended to "not listed under CITES". It is unclear why it says "limited data" and then "no data on non-vertebrates". The table needs further clarification and correction. Correct wording is "invertebrates".	The definitions have been clarified; the table has been removed to streamline layout throughout chapter.
244	Kathryn Phillips (on behalf of UNEP - WCMC)	4	68	2255	68	2255	delete "following" or "below"	The Table has been removed, so remark nota applicable anymore.
245	Kathryn Phillips (on behalf of UNEP - WCMC)	4	68	2243	28	2244	Isn't this about sustainable local economic benefits too i.e. ones which will be maintained in the long term?	Yes! The sentence was confusing and has been removed.
246	Kathryn Phillips (on behalf of UNEP - WCMC)	4	68	2258	68	2259	Table 4.2 reads very strangely. Subsistence Economic Activity isn't an economic driver, it's more a description of the system in which use of wildlife is happening, so what 'equates supply and demand'? (in this case it seems to be that the same people influence both, so direct interests in sustainable supply). Globalisation also isn't a driver alone, it is if it opens up systems to international demand, but likewise, population growth and urbanisation could do the same thing but aren't mentioned. Again, could the economic drivers be focussed around supply and demand, and then the chapter could talk about management approaches which try to balance supply and demand. E.g. tourism is about changing preference for wildlife, it reduces the market supply of wildlife products as the returns to having wildlife visible in ecosystem is high. NB. if these aren't the kind of things that you're trying to measure - maybe just a new title for the table would be better (although then I think it would still need to articulate more clearly what it is attempting to describe how to measure	The table has been removed and the section has been rewritten in light of the comment.
247	Kenward, Robert	4	68	2258	68	2258	Would a section in Table 4.2 on Cultural (or Recreational) activity be appropriate, to include the situation as populations move away from poverty and culture becomes a more important driver, as evidenced in Europe and North America? Main indicators are spending and participation numbers, with significant data available for North America and Europe, as noted in comment for line 652 above (NB data are available on participation/spend for hunt/fish/watch).	This topic is dealt with in the section "cultural drivers".
248	Kathryn Phillips (on behalf of UNEP - WCMC)	4	69	2279	69	2281	In spite of starting "on the other hand" this sentence doesn't seem to contradict the sentence before it. It also seems to imply that you can readily scale up values from local to global which I do not think is necessarily true.	This part has been removed, so that the comment no longer applies.
249	Kathryn Phillips (on behalf of UNEP - WCMC)	4	69	2282	69	2282	Think financial is possible a better work than fiscal in this context	Thanks. It now has been changed.
250	Kathryn Phillips (on behalf of UNEP - WCMC)	4	70	2302	70	2304	I think this might need a reference or a bit more explanation. Also to balance it out, I guess there are also health benefits of a non-local diet too in that it probably helps people access the vitamins and minerals they need from food year round more easily?	We have removed that sentence
251	Kathryn Phillips (on behalf of UNEP - WCMC)	4	70	2335	71	2356	I think this perhaps needs a bit of reworking too, the threats are a bit jumbled up i.e. some are about land use change around an areas (supply), some are about changes in the nature of demand facing the economy (tourism), they are external drivers changing what the small local economy for wildlife products can / is incentivised to produce rather than risks to the management system aren't they? (except for the threat of non-use conservation)	We have removed those sentence here and integrated them better in the text.
252	Kathryn Phillips (on behalf of UNEP - WCMC)	4	70	2307	20	2308	I think this sentence needs reworking to make it clear (if this is what it's trying to say) that the scaling up of production of products that were previously produced and consumed at a local scale has created big and financially valuable markets for some products. Is that what it's trying to say? I think this needs paragraph (from line 2305) perhaps needs unpacking a bit.	This has been rephrased.
253	Kathryn Phillips (on behalf of UNEP - WCMC)	4	71	2348	71	2360	what risk is this trying to convey?	Risk of sustainable use, but we realize that is not very clear. So it has been changed.
254	Germany	4	72	2371	72	2373	Is the text a description of Figure 4.12? In that case please format to consistent font size and colour. If it is a part of the text above, then please make sure to clearly have a distinction from the graph.	The figure and caption has been removed
255	Kathryn Phillips (on behalf of UNEP - WCMC)	4	72	2377	72	2379	Isn't that quite a small number in the context of the Canadian economy though? Could it be made more local e.g. a proportion of a smaller region spending on food?	That sentence has been removed.
256	't Sas-Rolfes, Michael	4	73	2407		2408	"Although private and state own property rights have been defined as critical..." Unclear what this means. Requires better explanation	This paragraph has been removed, so comment no longer applies.
257	't Sas-Rolfes, Michael	4	73	2416			Incorrect citation of Ostrom	Reference corrected.
259	Doering, Ralf	4	73	2419	73	2421	Sorry but I can not read this anymore. Hardin was wrong in many aspects including the commons in England. Hardin described the 'tragedy of open access' and not the 'tragedy of the commons'. In fisheries, for example, many models still assume open access although most of the fisheries analysed with the models are under some kind of regulation. Therefore, I would avoid going back to Hardin.	This paragraph has been removed, so comment no longer applies.
260	Germany	4	73	2416	73	2426	The reference should read Ostrom et al. 1999/ Ostrom 2009 and not Elinor, which is Mrs Ostrom's first name.	Reference corrected
261	Kathryn Phillips (on behalf of UNEP - WCMC)	4	73	2390	73	2390	Countries not regions? Sounds odd otherwise as sounds like Colombia is being described as a region.	Thanks. It now has been changed.
262	Kathryn Phillips (on behalf of UNEP - WCMC)	4	73	2401	74	2434	This seems to be setting out the framing of the problem with wildlife products and sustainability. I therefore suggest this comes earlier - perhaps at the start of a section describing management approaches for delivering sustainable use. This could then include the sections 4.2.5.2.1, 4.2.5.2, 4.2.5.2.4, 4.2.5.2.5. for example (as well as the section on Mixed Indigenous Economies (p75 line 2409 onwards) and the proposed section on 4.2.5.5. on Market Policy and Regulation of Economic Trade (p84 line 2814))	Indeed, it has been moved it to the political drivers sections, which comes earlier.

263	Kenward, Robert	4	73	2401	73	2426	It may be worth noting that, in a Europe-biased sample of some 34 local case studies on sustainability of using of biodiversity and ecosystem services, the most important factors were adaptive management and knowledge leadership, with being private/communal-managed land (not state-managed) a weaker but detectable factor (Kenward, R.E. et al. 2011. Identifying governance strategies that support biodiversity, ecosystem services and resource sustainability. Proceedings of the National Academy of Sciences 108: 5308–5312).	This paragraph has been removed, so comment no longer applies. (relevant for political drivers section)
264	Kenward, Robert	4	73	2416	73	2426	Should the 'Elinor' cited here, and not in References, actually be 'Ostrom'?	Reference corrected
265	Doering, Ralf	4	74	2429	74	2431	In my view this is the main reason while situations like the one described by Hardin in 1968 occurred. The local rules to avoid overexploitation were destroyed. One example is today the fishing rules for communities at the coast of Western Africa where governments sell fishing rights to foreign nations. Stocks were and are overfished and the coastal communities had nothing to fish anymore. In other cases they were forced to fish more to deliver fish to a local processing plant which was built with the foreign money. At the end this increased the pressure on stocks from several sides and lead to depletion.	I agree (the assumption should be nuanced. There are still fish to be caught for small-scale fishermen, but with lower economic values, that means Sardinella, Etthmalosa, Octopus..)Cornier-Salem MC). MCCC. Note: has been moved to political drivers section
266	Adeline Lerambert	4	75	2493	75	2493	Ellenberg 2017. Impacts of penguin tourism. In Ecotourisms Promise and Peril pp 117-132. <a href="https://link.springer.com/chapter/10.1007/978-3-319-58331-0_8">https://link.springer.com/chapter/10.1007/978-3-319-58331-0_8</a> Also worth citing Buckley 2010 Evaluating the Net Effects of Ecotourism on the Environment: A Framework, First Assessment and Future Research. Journal of Sustainable Tourism 17(6) DOI: 10.1080/09669580902999188	Citations added in appropriate section.
267	Germany	4	75	2474	75	2474	We encourage the authors to include a reference which backs up this statement.	Reference added
268	Kathryn Phillips (on behalf of UNEP - WCMC)	4	75	2472	75	2496	Ecotourism would feel better placed discussed within the section on global tourism i.e. 4.2.5.3.8.	We have restructured the headings, as ecotourism is indeed part of global tourism
269	Kathryn Phillips (on behalf of UNEP - WCMC)	4	75	2472			Need to outline what this section aims to do (how does it/will it relate to drivers and sustainable use?) - to avoid repeating chapter 3.	The section has been rigorously rewritten.
270	Kathryn Phillips (on behalf of UNEP - WCMC)	4	75	2473	75	2474	The dev of local communities'? ...needs a review of the sentence	Sentence has been revised
271	Kathryn Phillips (on behalf of UNEP - WCMC)	4	75	2491	75	2495	There are a number of useful case studies and concepts found in 'facing the wild' Chila Bulbeck although more recent ones needed too, and gorilla ecotourism can provide a key example of costs and benefits of 'development economics' around sustainable use of mammal species in a non-extractive way. History nd summaries can be found in 'conservation in the 21st C, gorillas as a case study' by Stoinski, steklis et al. Avoid duplication of 'uses' in chapter 3 by focusing on the economics aspects that surround the examples?	The book chapter has been discussed and referenced.
272	White, Michael	4	75	2470	75	2470	Two good citizen science programmes are <a href="http://www.coralwatch.org">www.coralwatch.org</a> and <a href="http://www.projectnoah.org">www.projectnoah.org</a>	This part has been removed, so comment no longer applies.
273	Adeline Lerambert	4	76	2508	76	2511	However the privatisation of proterty rights to wildlife does not necessarily imply the resource will be sustainably used. Take for example the decline in hunting blocks in Tanzania (by 72%) and Zambia (by 40%). Chardonnet (2019) AFRICA IS CHANGING: SHOULD ITS PROTECTED AREAS EVOLVE? RECONFIGURING THE PROTECTED AREAS IN AFRICA <a href="https://conservationaction.co.za/wp-content/uploads/2019/03/etudesAP_confiqAP_EN.pdf">https://conservationaction.co.za/wp-content/uploads/2019/03/etudesAP_confiqAP_EN.pdf</a>	This section has been removed. However, the provided insights are used in the "Tourism" section.
274	Jungwiattanon, Megan	4	76	2523	76	2523	Section 2.5.3.5 Fishing Extraction - Impacts on Use of Wild Species is yet to be developed. This section should address fishing impacts from large scale commercial fisheries within national waters and on the high seas, in addition to artisanal and coastal fisheries. This section could also discuss fisheries management and bycatch issues, including those species that are not target species but are still retained (i.e. sharks for their fins).	The role of management on sustainable use in fisheries will be discussed in other sections and chapters.
275	Kathryn Phillips (on behalf of UNEP - WCMC)	4	76	2504	77	2565	These sections / proposed sections seem to be all about competition for land and resources. I think they should be titled as such and analysed as suggested about in terms of their impacts on supply and demand for wildlife products e.g. lots of actions which take out natural habitat will reduce supply, but if the create e.g. alternative protein sources, they might also reduce demand for (in this example) wild meat. Tourism might increase demand for wildlife but in a different form so the issue could be around who captures the value (if the same community, less of a problem perhaps?)	This is now addressed in the political drivers section.
276	Kujirakwinja, Deo	4	76	2523	76	2523	Authors can draw an example from the Virunga Naional Park in the book from de Merode & Languy. 2006 but also from Kujirakwinja et al. 2010. Healing the rift	Section has been removed, so comment no longer applies.
277	Adeline Lerambert	4	77	2556	77	2557	Studies and reports have increasingly questioned the economic, conservation and societal values of trophy hunting activities, and its sustainability (Economists at Large 2013; Grijalva 2016). With money to be made, animal populations are often manipulated and quotas set to maximise profits, recommended age-based and area-based limitations are frequently ignored, and hunting levels often exceed quotas (Creel et al. 2016; IUCN 2016). Published field studies have brought the conservation credentials of trophy hunting into question in relation to African lions and leopards in Tanzania ( <a href="http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0005941">http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0005941</a> ), lions in Zimbabwe ( <a href="https://lovewildlifeafrica.com/wp-content/uploads/2015/10/Loveridge-et-al-2007-impact-of-trophy-hunting-on-lion-population-dynamics-in-Hwange.pdf">https://lovewildlifeafrica.com/wp-content/uploads/2015/10/Loveridge-et-al-2007-impact-of-trophy-hunting-on-lion-population-dynamics-in-Hwange.pdf</a> ), leopards in South Africa ( <a href="https://africageographic.com/blog/leopard-hunting-quota-was-issued-despite-official-report-showing-significant-population-declines/">https://africageographic.com/blog/leopard-hunting-quota-was-issued-despite-official-report-showing-significant-population-declines/</a> ), and elephants across parts of Southern Africa ( <a href="https://online.library.wiley.com/doi/pdf/10.1002/jwmg.641">https://online.library.wiley.com/doi/pdf/10.1002/jwmg.641</a> ), among others	We include now the various problems associated with trophy hunting, including the references suggested.
278	Kathryn Phillips (on behalf of UNEP - WCMC)	4	77	2541			Ecotourism and global tourism need some careful distinguishing from each other and focusing on relationship to use of wild species.	We have restructured and integrated ecotourism in the tourism section.
279	Kenward, Robert	4	77	2555	77	2555	"dimensions" should be singular	Thanks. It now has been changed.
280	Kenward, Robert	4	77	2561	77	2561	"For example, for the snow leopard" insert 'for' or, better, delete 'the snow leopard' because the quote refers to trophy hunting of snow leopard prey, not the snow leopard.	Sentence has been changed
281	Kenward, Robert	4	77	2552	77	2552	"might be if communities" (add 'if')	Sentence has been changed
282	Quinnell, Mark	4	77	2545	77	2546	Marine protected areas currently cover around 8 per cent ( <a href="https://www.protectedplanet.net/marine">https://www.protectedplanet.net/marine</a> ) Terrestrial protected areas around 15 per cent ( <a href="https://www.protectedplanet.net/target-11-dashboard">https://www.protectedplanet.net/target-11-dashboard</a> )	We have updated numbers and provided references.

283	't Sas-Rolles, Michael	4	78	2566	84	2815	This section may benefit from some input from the following recent review on the topic: 't Sas-Rolles, M., Challender, D.W.S., Hinsley, A., Verissimo, D., Milner-Gulland, E.J., 2019. Illegal Wildlife Trade: Scale, Processes, and Governance. Annual Review of Environment and Resources 44, 201–228. <a href="https://doi.org/10.1146/annurev-environ-101718-033253">https://doi.org/10.1146/annurev-environ-101718-033253</a>	Thanks for pointing it out. The citation was included.
284	Adeline Lerambert	4	78	2600	79	2613	Important to recognise the value of trade bans, which were responsible for rapid and dramatic declines in elephant poaching in 1989, and declines in demand (and therefore poaching) of rhinoceros species in the 1990s ( <a href="https://eia-international.org/blog/history-repeating-the-illegal-trade-in-rhino-horn/">https://eia-international.org/blog/history-repeating-the-illegal-trade-in-rhino-horn/</a> ). Trade bans can be successful if they are universally implemented and accompanied by robust public education and demand reduction programmes. This part of the chapter seems to provide a very one-sided view.	Ok. Will be corrected.
285	Adeline Lerambert	4	78	2600	79	2613	Lacking examples of the benefits of total trade bans.	We have now highlighted the benefits of trade bans, as well as unintended effects
286	CAMARENA, Maria	4	78	2600	78	2603	This is an oversimplification of CITES regulations. CITES does not simply rely on trade bans; these are used only as a last resort when other compliance measures have failed. CITES regulates trade through sustainable, legal and traceable standards, and allows for the establishment of sustainable exports (e.g. national voluntary quotas). Please include the verbatim objective of the Convention, which will avoid falling in misconceptions of these sorts.	This section was reworded.
287	CAMARENA, Maria	4	78	2576	78	2584	This paragraph seems incomplete.	Thanks. It now has been changed.
288	CAMARENA, Maria	4	78	2585	78	2599	Whenever referring to wildlife trade, it is crucial to make a distinction between illegal, unregulated, and legal trade. This to not fall into the misconception that all trade is detrimental (which is NOT the case). Throughout this assessment, LEGAL trade shall be acknowledged as the sustainable (option) to other "extractive" (as per the SUA categories) alternatives.	Agreed.
289	Freyer, Daniela	4	78	2600	79	2613	This paragraph should include positive examples, that highlight the benefits of trade bans, in reducing pressure, respectively ensuring the survival of affected species, as well as reducing the risk of invasion by IAS in destination countries. It should be acknowledged that CITES trade bans have been vital in ensuring the survival of species for which commercial trade is the major threat. Examples are elephants, rhinos, sea turtles, highly endangered parrot or tortoise species. Suggested references on the benefit of trade bans with regard to IAS: Cardador L, Tella JL, Anadón JD, Abellán P, Carrete M. The European trade ban on wild birds reduced invasion risks. Conservation Letters. 2019. e12631. <a href="https://doi.org/10.1111/conl.12631">https://doi.org/10.1111/conl.12631</a> ; L. Reino, R. Figueira, P. Beja, M. B. Araújo, C. Capinha, D. Strubbe. 2017. Networks of global bird invasion altered by regional trade ban. Sci. Adv. 3, e1700783; Carrete, M., Tella, J.L., 2008. Wild-bird trade and exotic invasions: a new link of conservation concern? Frontiers in Ecology 2008; 6(4): 207–211, doi:10.1890/070075	This section was reworded.
290	Germany	4	78	2600	79	2613	The risk described seems speculative and it questionable whether this kind of harvesting is feasible for traders. Questionable, whether elephant tusks are a fitting example. Suggest deletion of this "risk" of trade ban as it does not seem to be a real risk under CITES and no evidence is shown. Long delay of trade bans is not a "drawback" of the trade ban itself.	This paragraph will be revised
291	Jungwiattanon, Megan	4	78	2600	78	2600	CITES is not accurately portrayed here. CITES does not mean a trade ban, which is why it would help on P 42 to better describe what CITES is and does.	This paragraph will be revised.
292	Jungwiattanon, Megan	4	78	2600	79	2613	This section notes that the most direct way to regulate the wildlife trade is through CITES and then lists several drawbacks with trade bans. The paragraph comes off quite negative - perhaps it could also discuss successes of CITES. Such as species populations that have seen recovery after a CITES listing? Or consumer awareness that has increased after a listing? Later on, line 2651 notes that overfishing has "pushed two families of rays to the brink of extinction". In recent years CITES has added several rays to its lists. It is hoped that CITES will protect these rays from overharvesting.	This paragraph will be revised.
293	Kathryn Phillips (on behalf of UNEP - WCMC)	4	78	2566	78	2566	Wonder if this should be about Wildlife Product Trade - just because (international) tourism comes up in trade statistics (so it trade) too. Also it seems to be mainly focused on international trade initially but implies domestic trade too in sub section 4.2.5.3.9.1. so perhaps this could be clearer?	The whole section is called Trade now. It deals with trade at different scales.
294	Kenward, Robert	4	78	2584	78	2584	unfinished sentence	Thanks for pointing it out.
295	Kujirakwinja, Deo	4	78	2584	76	2584	incomplete sentence that need attention	Thanks for pointing it out.
296	Morgan, David (on behalf of CITES)	4	78	2600	78	2602	Commercial trade is banned in only 3% of CITES-listed species.	The paragraph was revised.
297	't Sas-Rolles, Michael	4	79	2630			Cooney et al 2015 is not in the final Reference list; many other references also missing from this section	Thanks for pointing it out.
298	Adeline Lerambert	4	79	2626	79	2627	But can also provide local incentives for overexploitation and extirpation, such as the poaching of rhinoceros on Mozambique	Thank you. Point taken
299	CAMARENA, Maria	4	79	2614	80	2677	-Throughout this sub-section, it is unclear when the authors are referring to legal vs illegal trade. It is important to make this distinction, since in some cases trade is portrayed in a positive (sustainable and pro-livelihoods) light, whereas in other cases it is portrayed as a threat to wildlife. - Similarly, though in CITES context, "trade" is always understood to be "international", the SUA is broader in its approach, and should make a further distinction between international and sub-regional or sub-national trade.	Thanks for this suggested change. We have included it in the new version.
300	Kathryn Phillips (on behalf of UNEP - WCMC)	4	79	2605	79	2605	Do we know if this price rise is just down to the supply effect of banning trade or is there a demand element too??	Good point. The section has been rewritten and the example is no longer explained.
301	Kathryn Phillips (on behalf of UNEP - WCMC)	4	79	2615	79	2615	Feel like this definition might be useful earlier on - at the start of a section on trade?	The definition will be mentioned earlier on.
302	Adeline Lerambert	4	80	2670	80	2677	Consider Nadal & Aguayo 2014 Leonardo's Sailors, A Review of the Economic Analysis of Wildlife Trade. <a href="http://theistudyofvalue.org/wp-content/uploads/2014/06/WP5-Nadal-and-Aguayo-Leonardos-Sailors-2014.pdf">http://theistudyofvalue.org/wp-content/uploads/2014/06/WP5-Nadal-and-Aguayo-Leonardos-Sailors-2014.pdf</a>	We are grateful for the reference, we will look at it
303	Adeline Lerambert	4	80	2665	80	2667	Not always the case. Prices for elephant ivory slumped with the announcement and implementation of the domestic trade ban in China. <a href="https://phys.org/news/2017-03-elephants-ivory-prices-fall-group.html">https://phys.org/news/2017-03-elephants-ivory-prices-fall-group.html</a> A coherent narrative needs to include the cases of detrimental effects of legalising trade of wildlife products on wildlife populations (such as the CITES legalisation of trade with ivory of Botswana, Namibia and South Africa with Japan 2007).	References for the case mentioned by the reviewer will be checked and included.
304	Germany	4	80	2665	80	2677		This is a good point to be considered.
305	Germany	4	80	2659	80	2662	Please include references and put a stronger emphasis on the topic of "demand is rising".	We will include references to the rise of demand.

306	Jungwiattananaporn, Megan	4	80	2651	80	2651	Again, noting the link between fishing, demand, and trade could be useful. "Overfishing has pushed two families of rays to the brink of extinction" – due to demand and trade, which is why trade regulation is needed and one way to slow decline.	This paragraph will be revised
307	Jungwiattananaporn, Megan	4	80	2662	80	2663	More nuance could be provided when discussing CITES. CITES doesn't just do trade bans, that is only if the species is listed in Appendix I. If listed on Appendix II, trade is still allowed as long as it is proven to be legal, sustainable, and traceable.	Thanks for this suggested change. We have included it in the new version.
308	Kathryn Phillips (on behalf of UNEP - WCMC)	4	80	2648	80	2677	Again, these are risks around supply and demand / the ability to regulate it and it seems like the logic of the discussion could be strengthened by going back to this basis a little more.	Thanks for this suggested change. We have included it in the new version.
309	Morgan, David (on behalf of CITES)	4	80	2658	80	2659	Demand for illegal specimens is rising? Or demand overall?	Wording will be revised.
310	Morgan, David (on behalf of CITES)	4	80	2658	80	2662	Numbers of tigers and rhinos in the wild seem to be rising	Evidence will be revised for the cases mentioned.
311	Morgan, David (on behalf of CITES)	4	80	2665	80	2669	Would be interesting if there was any evidence of this. MacMillan et al., 2017 not detailed in the references to the chapter.	The full reference will be included.
312	Germany	4	81	2684	81	2700	It would be appreciated if a more up-to-date reference on this topic is used because those proportions might have changed after almost 16 years which have seen the growth of a middle-income class in many developing countries and the economic recession in most industrialized countries in 2008/09.	Data from the beginning of the century will be updated. Reference added: United Nations Conference on Trade and Development (UNCTAD). Towards more balanced growth strategies in developing countries: issues related to market size, trade balances and purchasing power. Discussion Papers No. 214. Geneva, Switzerland, December 2013.
313	Germany	4	81	2711	81	2714	Please insert a reference to support the statement.	Reference added: Sikka, T. The contradictions of a superfood consumerism in a postfeminist, neoliberal world. <i>Food, Culture &amp; Society</i> , 2019, Vol. 22, No. 3, pp. 354-375. More references will be included and contextualized.
314	Kathryn Phillips (on behalf of UNEP - WCMC)	4	81	2678	84	2813	These sections seem mostly to be about targeting demand and I think could usefully be described as such.	Agree, it will be described as demand. But when some references consider specific data of consumption it will be specified.
315	CAMARENA, Maria	4	82	2717	82	2717	The concept of illegal wildlife trade is mentioned before, so its acronym (IWT) should be introduced sooner.	We will mention the acronym when illegal wildlife trade is mentioned for the first time in the chapter.
316	Kathryn Phillips (on behalf of UNEP - WCMC)	4	84	2817	97	3154	4.2.6 Nice section that relates various cultural etc drivers to outcomes for wild species. Could be streamlined by reducing any further lit review describing uses which could be moved to chapter 3 (where improvement needed).	Thank you.
317	Lafaye de Micheaux Flore	4	84	2816	96	3170	Some additional references proposed for the 4.2.6 section: Allison, Elizabeth. 'Spirits and Nature: The Intertwining of Sacred Cosmologies and Environmental Conservation in Bhutan'. <i>Journal for the Study of Religion, Nature and Culture</i> 11, no. 2 (16 June 2017): 197–226. <a href="https://doi.org/10.1558/jsmc.18905">https://doi.org/10.1558/jsmc.18905</a> Bhagwat, Shonil A, Alison A Ormsby, and Claudia Rutte. 'The Role of Religion in Linking Conservation and Development: Challenges and Opportunities'. <i>Journal for the Study of Religion, Nature and Culture</i> 5, no. 1 (20 April 2011). <a href="https://doi.org/10.1558/jsmc.v5i1.39">https://doi.org/10.1558/jsmc.v5i1.39</a> Cocks, Michelle Linda, and Anthony Patrick Dold. 'The Cultural Use of the Wild Olive Tree by the AmaXhosa People in the Eastern Cape Province of South Africa'. <i>Journal for the Study of Religion, Nature and Culture</i> 2, no. 3 (16 January 2008). <a href="https://doi.org/10.1558/jsmc.v2i3.292">https://doi.org/10.1558/jsmc.v2i3.292</a> Izidine, Samira A, Stefan J Siebert, Abraham E Van Wyk, and Alphaeus M Zobolo. 'Taboo and Political Authority in Conservation Policy: A Case Study of the Licuati Forest in Maputaland, Mozambique'. <i>Journal for the Study of Religion, Nature and Culture</i> 2, no. 3 (16 January 2008). <a href="https://doi.org/10.1558/jsmc.v2i3.373">https://doi.org/10.1558/jsmc.v2i3.373</a> .	Thanks. Will check & add.
318	Anthony, Brandon P.	4	85	2841	89	2936	consider using findings of Anthony et al 2011 [Anthony, B.P., Abonyi, S., Terblanche, P. and Watt, A. . 2011. Towards bridging worldviews in biodiversity conservation: exploring the Tsonga concept of ntumbuloko in South Africa. In <i>Research in Biodiversity - Models and Applications</i> . ed. Pavlinov, I.Y., 3-24. Rijeka, Croatia: InTech Publishers. Available at <a href="https://www.intechopen.com/books/research-in-biodiversity-models-and-applications/towards-bridging-worldviews-in-biodiversity-conservation-exploring-the-tsonga-concept-of-ntumbuloko-">https://www.intechopen.com/books/research-in-biodiversity-models-and-applications/towards-bridging-worldviews-in-biodiversity-conservation-exploring-the-tsonga-concept-of-ntumbuloko-]</a>	Thanks. The reference has been used.
319	Anthony, Brandon P.	4	90	2937	92	2980	consider using Buij et al 2015 [Buij, R., Nikolaus, G., Whytock, R., Ingram, D.J. and Ogada, D.L. 2015. Trade of threatened vultures and other raptors for fetish and bushmeat in West and Central Africa. <i>Oryx</i> 50(4): 606-616.]	Thanks. Though this reference might not fit into taboo and superstitions section, this will help in the trade section. Will use the reference accordingly.
320	Kenward, Robert	4	91	2967	91	2968	Enlarge the scale for proportion threatened and show its scale on right side of y-axis?	Thanks.
321	CAMARENA, Maria	4	92	2969	92	2980	- In the introductory lines of this box, include mention to its listing in CITES (Appendix I, under the higher taxonomic listing of <i>Pan spp.</i> ). - Editorial: change bushmeat to "wild meat".	Thanks. The information has been added.
322	CAMARENA, Maria	4	92	2984	92	2984	Editorial: typo in "Victor", and inconsistency in including the reference (is it a personal communication?).	Thanks for the comment. The typo is corrected it is Toledo (2011) Toledo, V. M. (2001). Indigenous peoples and biodiversity. <i>Encyclopedia of biodiversity</i> , 3, 451-463.
323	Kenward, Robert	4	92	2987	92	2988	Does not ILK mean Indigenous and Local Knowledge, such that knowledge of local communities everywhere is included? As recognised at 3048, in many European countries too, local people have gathered knowledge of conservation value for >1 millennium.	Yes, ILK means Indigenous and Local Knowledge. Thanks.
324	Molnár, Zsolt	4	92	2981	94	3067	I found this section good, but too general, a bit rosy and overlapping with other sections. More concrete information (like in chapter 6) would be more useful for the readers (summary of case studies focusing on the relevant key info from the case study).	Thanks for the comment. Will try and modify it.
325	CAMARENA, Maria	4	95	3078	95	3078	Editorial: typo in "help" (change to "helps").	Edited. Thanks
326	Kenward, Robert	4	95	3084	95	3084	"To date, academic efforts have ..."	Edited. Thanks
327	Adeline Lerambert	4	97	3152	97	3154	And, of course, the burgeoning consumer classes referenced earlier can substantially increase demand for products which were once the domain of the wealthy elite, placing additional burdens on species (eg rhino horn, bear bile) and driving declines.	Thanks. Very much agreed with the point
328	Adeline Lerambert	4	97	3164	97	3164	Decision-making cannot be solely science-based - it must accommodate ethical and societal concerns	Thanks for this suggested change. We have included it in the new version.
329	Adeline Lerambert	4	97	3157	97	3157	The use of elephants, lions and rhino is anything but sustainable. All of these species have declined dramatically in recent decades, and (in the case of elephants and lions) continue to do so, in part at least due to continuing unsustainable use.	Thanks for this suggested change. We have included it in the new version.

330	Meera Anna Oommen	4	97	3156	97	3170	<p>This section could benefit from adding some more detail incorporating some of the following ideas: There is a very strong difference in opinion between those who argue for equal moral standing at par with humans (e.g. the compassionate conservation, just preservation and critical animal studies viewpoints) as well as those who caution against moral extensionism (e.g. Roderick Neumann, 2004. Moral and discursive geographies in the war for biodiversity in Africa) and the practical fallout of stances such as compassionate conservation (e.g. Oommen et al. 2019. The fatal flaws of compassionate conservation). This is critical as moral pronouncements and lobbying by urban, animal rights and liberation groups (especially ill-informed celebrities and campaigners mostly from Western developed nations) have been instrumental in imposing some of these bans without adequate incorporation of scientific reasoning or data. Opponents of this practice are perhaps not aware of the complex history of trophy hunting (e.g. evolutionary benefits in human history gained from improved status acquired either by prestige or dominance) and their limited understanding of recent colonial and American trophy hunting treats this practice as an entirely wasteful and immoral activity. Local communities who may benefit (or not) from such practices, or may have their own cultural viewpoints (for or against such a practice) are also excluded from decision-making. While there is no doubt that trophy hunting or any other form of hunting and use will benefit from greater regulation, it should incorporate inclusive decision making involving key stakeholders.</p>	Thanks for this suggested change. We have included it in the new version.
331	Mulá, Anna	4	97	3170	97	3171	<p>In this context, animal welfare considerations are very necessary in the following sense: There is a general consensus around the idea that decisions on animal welfare need to be taken based on scientific evidence. Animals are sentient beings. They can feel pain –physical pain and emotional pain perceived when there is an unpleasant emotional state-, which leads to suffering and a response to the pain stimuli. The capacity to feel pain has been proven to exist in vertebrates (mammals, birds, amphibians, reptiles and fish) and in some invertebrates (Mellor et al. 2009).</p> <p>Suffering, understood as the awareness of a negative sensory experience, is accepted by many scientists. Griffin DR y Speck GB (2008) New evidence of animal consciousness. En The Animal Ethics Reader, 2a ed. Armstrong SJ y Botzler RG (eds.), Routledge, 126-134.</p> <p>In this context, science indicates that the evolutionary origin, anatomy, neurology, physiology, biochemistry, genetics, behavior and adaptive function involved in the mechanisms of suffering in people are similar to those observed in animals. Walker M., Diez-Leon M., Mason G. (2014). Animal Welfare Science: Recent Publication Trends and Future Research Priorities. International Journal of Comparative Psychology, 27(1).</p> <p>In July 7th 2012, prominent neuroscientists met in Cambridge University to celebrate the Francis Clark Conference on Consciousness in Human and Non-Human Animals. By the end of this event the Cambridge Declaration on Consciousness was signed (Cambridge Declaration 2012) which summarized the most important outcomes of current research and discoveries about the experience of consciousness and behaviors related to it both of human and non-human animals. The signatories declare that "Consequently, the weight of evidence indicates that humans are not unique in possessing the neurological substrates that generate consciousness. Nonhuman animals, including all mammals and birds, and many other creatures, including octopuses, also possess these neurological substrates". Low P. et al. (2012) The Cambridge Declaration on Consciousness Also, in an extensive and detailed collection of publications, a group of 19 researchers acknowledged that, as in people, in animals there are different levels of consciousness and many animals studied exhibit complex and conscious cognitive processes. Bermond B (2008) A neuropsychological and evolutionary approach to animal consciousness and animal suffering. En The Animal Ethics Reader, 2a ed. Armstrong SJ y Botzler RG (eds.), Routledge, Reino Unido: 99-112</p>	Thank you for your comment. While animal welfare concerns all animal species, it has been of special concern for domesticated ones, which are clearly out of the scope of this assessment. Animal welfare is increasingly being incorporated into concepts of sustainable use of wild species but it was not identified in the scoping report for the sustainable use assessment and is not dealt with in any detail in this assessment. Nevertheless, this issue would deserve a dedicated assessment.
332	Germany	4	98	3202	98	3202	<p>An additional reference on using DNA barcoding to detect illegally traded orchids in Sale could be Gharbani et al. 2016. Ghorbani, A., Gravendeel, B., Selliah, S., Zarré, S., Boer, H. de, 2017. DNA barcoding of tuberous Orchidoideae: a resource for identification of orchids used in Sale. Molecular Ecology Resources 17, 342–352. <a href="https://doi.org/10.1111/1755-0998.12615">https://doi.org/10.1111/1755-0998.12615</a></p>	Thank you for your comment. Suggested references are now added on the new draft.
333	Germany	4	98	3197	98	3197	<p>Please add in situ conservation (Kell et al. 2012) and kindly also provide a reference for "set priorities for ex situ conservation", e.g. (Castañeda-Álvarez et al. 2016).</p> <p>Castañeda-Álvarez, N.P., Khoury, C.K., Achicanoy, H.A., Bernau, V., Dempewolf, H., Eastwood, R.J., Guarino, L., Harker, R.H., Jarvis, A., Maxted, N., Müller, J.V., Ramirez-Villegas, J., Sosa, C.C., Struik, P.C., Vincent, H., Toll, J., 2016. Global conservation priorities for crop wild relatives. Nature Plants 2, 16022. <a href="https://doi.org/10.1038/nplants.2016.22">https://doi.org/10.1038/nplants.2016.22</a></p> <p>Kell, S., Maxted, N., Frese, L., Iriondo, J.M., 2012. In situ conservation of crop wild relatives: A methodology for identifying priority genetic reserve sites 47. <a href="http://www.biopark.com.au/Sugarcane_pulp_plates_eic_e.g._www.biopark.com.au">www.biopark.com.au</a></p>	Thank you for your comment. Suggested references are now added on the new draft.
334	White, Michael	4	99	3219	99	3223	<p>This section heading purports to investigate 'Interactions among Drivers and Environmental Outcomes' - first, it is unclear why these two aspects should be combined: the interactions should be explored and an analysis of environmental outcomes is crucial, but they would each merit their own section, and the latter should be addressed for all drivers AND intractions between drivers.</p>	Thank you for your comment. Suggested references are now added on the new draft.
335	Adeline Lerambert	4	102	3283	102	3283	<p>This section highlights the difficulty in separation of the content between the two chapters 3 and 4. The concept of what the drivers are driving becomes another description of uses largely.</p>	Agreed
336	Kathryn Phillips (on behalf of UNEP - WCMC)	4	102	3286	102	3299	<p>Change ?</p>	Agreed
337	Kujirakwinja, Deo	4	103	3321	103	3321	<p>4.3.2. Ecological settings, rarity, resilience of ecosystem. I agree with the text but it is also appropriate for fishing not only for hunting</p>	Agreed
338	Le Pape Olivier	4	103	3324	103	3341	<p>no 4.3.2.2 remove 4.3.2.1 from the title</p>	Agreed
339	Le Pape Olivier	4	104	3342	104	3342	<p>I would recommend that authors consider the changes in hunting practices and legislations as one of the factors that should guide hunting management and approaches overtime</p>	Agreed
340	Kujirakwinja, Deo	4	105	3374	105	3379	<p>It is unclear that achieving sustainable use is in fact a 'wicked problem' as defined by Rittel and Webber. If we are going to use this terminology we should ensure that the diagnostic conditions are met.</p>	Agreed
341	't Sas-Rolfes, Michael	4	106	3390			<p>Unclear what the recommendations are. It is preferable to dissociate wildlife use (whether extractive or non-extractive) to terms such as "wicked problem". Rather focus this section on the main findings, and highlight those examples where sustainable use of wildlife has proven successful. Editorial: lower case for "recommendations" in the chapeau.</p>	Thank you for your comment. This assessment defines "sustainable use" as emerging from social-ecological systems that meet human needs without compromising ecosystem health. Sustainable use is not limited to anthropocentric considerations (i.e. the sustainability of the use for the benefit of people) or to ecological/environmental considerations (i.e. the conservation of the target resource in an ecosystemic perspective), but it encompasses both social and ecological considerations as well as the multiple aspects of their interactions (see Chapter 1, the definition is explored further in section 1.3.2).
342	CAMARENA, Maria	4	106	3389	106	3408	<p>Unclear what the recommendations are. It is preferable to dissociate wildlife use (whether extractive or non-extractive) to terms such as "wicked problem". Rather focus this section on the main findings, and highlight those examples where sustainable use of wildlife has proven successful. Editorial: lower case for "recommendations" in the chapeau.</p>	Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.
343	Kenward, Robert	4	106	3402	106	3402	<p>"marginalized"</p>	Corrected

344	Kenward, Robert	4	106	3400	106	3400	spelling: "unsustainable"	Corrected
345	Kujirakwinja, Deo	4	106	3392	106	3394	I suggest adding multiple levels given that various stakeholders and power-holders are involved in both the use and management of resources	Thank for your comment. Point well taken.
346	Meera Anna Oommen	4	106	3392	106	3394	The treatment of 'wicked problems' ideally requires way more analysis than just a reference to the nature of the problem. In fact, it would have been useful for the whole report to be framed under this overarching framework.	Thank you for your comment. The chapter structure follows the scoping document agreed by IPBES.
347	Zisenis, Marcus	4	106	0	107	0	These two chapters of Conclusions and Challenges should be the main part of Chapter 4, because the impacts are quite well-known of different drivers on biodiversity (their interactions hardly estimable of a particular case in space and time). New and innovative could be proposals for concrete improvements.	Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.
348	CAMARENA, Maria	4	108	3412	175	5706	Editorial: there are inconsistencies in the way references are listed (e.g. on occasions, first names are fully included, on others, only the initials).	Consistency in the way references are listed will be maintained
349	Martin Jean-Louis	4	129	4128	129	4128	Spelling of author name is Fahrig (not Fahrimg)	Thank you. We corrected it.
350	Morgan, David (on behalf of CITES)	4	4.2.2.1.1.2	782		783	The statement that hunting "can only be sustainable when scientific management is enforced for the determination of sustainable yields" is pertinent but doesn't this apply to all types of extractive/consumptive use? Why is this noted nly for trophy/recreational hunting?	Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
351	Morgan, David (on behalf of CITES)	4	4.2.2.1.1.2	805		806	Statistics to indicate the extent of trophy hunting included the number of skins exported for commercial purposes; however no all skin trade is trophy hunting. For example, bobcat skins from north america are a result of trapping to provide skins (primarily for fashion trade) and not a product of recreational hunting	Thanks for this observation. Well noted.
352	Morgan, David (on behalf of CITES)	4	4.2.2.1.5	1073		1177	The section on biofuels seems out of place in the sequencing of this chapter	This section has been removed as the chapter was restructured.
353	Morgan, David (on behalf of CITES)	4	4.2.2.1.6				Very much information, not very structured information. Could be much improved in structure and content if more would be shown with graphics. The general question is what this paragraph is intended to present. At this stage it is a rather wild set of data that would benefit from a better and clearer structure. On exexample is the trends being described of a shift from wild taken specimen to captive bred ones. There is no discussion what this trend means. Is it a positive trend for wildlife or not? Could it mask misuse of source codes. Cites has implemented a new process dealing with such doubts. So in general this section is not very helpful nor instructive.	Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.
354	Morgan, David (on behalf of CITES)	4	4.2.2.1.6	1016		1022	In this paragraph trade in live animals is considered to be primarily of illegal nature; however no evidence for this assumption is given.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
355	Morgan, David (on behalf of CITES)	4	4.2.3.1	1355		1356	Considering the relevance of CITES, this statement needs considerable more support and elaboration	Note: Dan Challander is a CA for this chapter that will be contacted once the chapter is re-organized to provide a more thorough analysis on CITES
356	Morgan, David (on behalf of CITES)	4	4.2.3.1	1355		1356	I suppose, this paragraph will be considerably expanded to give the topic as much weight as the previous on CBD	Note: Dan Challander is a CA for this chapter that will be contacted once the chapter is re-organized to provide a more thorough analysis on CITES
357	Morgan, David (on behalf of CITES)	4	4.2.3.3 and 4.2.2.4				A discussion on how international agreements such as CITES are perceived in this context and how the informal and formal governance and institution work together to comply with CITES requirements would be very helpful for our Convention. It might for instance give CITES information in the context of compliance processes.	Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.
358	Morgan, David (on behalf of CITES)	4	4.2.4.2.5				The policy recommendations do not really spell out what has been said before. It is not necessarily the aim to have people abandon use of wildlife, as long as it is sustainable ecologically but also from a social perspective. If sustainability can be assured, use of wildlife can even be beneficial to conservation in the long term.	Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.
359	Morgan, David (on behalf of CITES)	4	4.2.5.3.9	2600		2601	in through a trade ban; the statement implies CITES functions only to ban trade; which does not capture the intent of CITES and its aim to ensure sustainable trade for the majority of species it regulates	The paragraph was revised
360	Bates, Peter (TSU for ILK on behalf of the ILK Dialogue in Montreal)	4	all	all	all	all	Indigenous knowledge systems are a critical foundation for sustainable use which need to be better understood and appreciated at various scales (esp in relation to People-Animal-Plant relationships - a common theme across cultures and geographies). This should be explored further in chapter 4.	Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.
361	Bates, Peter (TSU for ILK on behalf of the ILK Dialogue in Montreal)	4	all	all	all	all	Major drivers of trends in sustainable use include engagement with youth, and reform of educational systems (e.g. with parallel tracks in education systems so youth learn both ways of knowing). Where this is being done effectively and where enabling conditions are in place, IPLC have been able to reverse declines in sustainable use. This has also in some places led to changes in laws and regulations to allow for IPLC use and management.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
362	Bates, Peter (TSU for ILK on behalf of the ILK Dialogue in Montreal)	4	all	all	all	all	Observation is also a positive driver of sustainable use. IPLC may engage in daily or regular monitoring and assessment of resources over time - such as subtle changes in leaves, fruit, flowers, water, wind, and fauna. With honed eyes they can see and attend to what others do not, and use these observations to set harvest levels and interpret traditional calendars. This knowledge can also be a basis for seeking a role with authorities in developing management plans.	Ok. Still need more discussion concerning IPLC parameters for biodiversity conservation.
363	Bates, Peter (TSU for ILK on behalf of the ILK Dialogue in Montreal)	4	all	all	all	all	Sustainable use of land, waters and resources is often congruent with inter-generational exchange and pride in use of lands and waters and their management. The worldwide surge of interest in cultural revival and species-specific festivals is an indication of expanding public interest in indigenous lifestyles and nature that can be highlighted and capitalized upon to expand sustainable use.	Ok. More balanced discussion will be presented in the next version.
364	Bates, Peter (TSU for ILK on behalf of the ILK Dialogue in Montreal)	4	all	all	all	all	The agency and independence of communities can also be a driver of sustainable use. Decentralized/local governance systems are the basis for better management of resources. Efforts should be made to re-channel funding to go directly to indigenous and local communities. There may be some examples or references that can be used here, such as community based governance models.	Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.
365	Bélanger, Julie	4	General comment				Please note that we have not extensively reviewed Chapter 4, but noted a few issues in passing.	Thank you for your feedback
366	Clavel	4	General comment				My remarks concerns two aspects : 1)North and South differentiation with regard to natural resources (including wild plants and trees) access and management as resources for CC adaptation and 2) the gender aspect.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
367	Meera Anna Oommen	4	General comment	NA	NA	NA	The use of the title "The drivers of the sustainable use of species" is confusing because in the first part of the chapter, it is the drivers of resource use/ use of species that are addressed. This is somewhat different. The drivers of use could be any of a large numbers of variables listed in the chapter, whereas the drivers of sustainable use would be some ideal conditions that promote sustainability, right?. It would help if the authors discussed this.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.

368	TERADA, Saeko	4	General comment			For terms of "Trade", "international trade", "domestic trade" and "commercial trade", those terms should be used quite differently. For example, CITES can regulate only "international trade" including "international commercial trade".		That is a good point. We have streamlined the definitions.
369	Clavel	4		from 2102 to 2209		<a href="https://www.iied.org/women-wildlife-workings-cbd">https://www.iied.org/women-wildlife-workings-cbd</a>		Thank you for your comment. All the mentioned points were addressed in the final version of the chapter.
370	Clavel	4		from 883-893		Fig 4.5 gives a comparison of uses in OECD and non-OECD countries (roughly between North and South) by comparing these uses, it is observed that non-OECD countries are more likely to declare the use of Wild Foods although this graph is very probably well below the reality of actual uses for food and medicine certainly due to gender bias in surveys.		Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
371	Clavel	4		from 2102 to 2209		<a href="http://www.interforum.fr/images/VOA/art/doc/b/4844ed24d313473832383135363638383930NONPUBLE.pdf">http://www.interforum.fr/images/VOA/art/doc/b/4844ed24d313473832383135363638383930NONPUBLE.pdf</a>		Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
372	Clavel	4		from 2102 to 2109		The gender chapter is very poorly addressed. Knowledge about local wild species is highly gendered (especially in the South). For the most part, women have this knowledge and pass it on to their daughters. This knowledge concerns medicinal plants as well as trees or tree parts (gum arabic, moringa, oils from nuts as karité, balanites, barks, fruit flowers, sap etc. etc.) and the benefits of wild plants in terms of diet. When we look at women's activities, these uses are indistinct because women have integrated (internalized) the fact that food and health are linked. Thus, we find these food and medicinal uses which today, have again right to used in many countries (and cities) of the South.		Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
373	Clavel	4		from 2102 to 2209		The studies are still very few compared to the reality of the situations but you will find many examples in the book of Patricia Howard and her colleagues, authoritative work and essential reference: <a href="https://www.academia.edu/34838902/Women_and_Plants_Gender_Relations_in_Biodiversity_Management_and_Conservation">https://www.academia.edu/34838902/Women_and_Plants_Gender_Relations_in_Biodiversity_Management_and_Conservation</a>		OK we will integrate these references and try to adress better the gender issue.
374	Erb, John	4		674		"economically AND CULTURALLY rewarding practice."		Thank you for this suggestion. We have chosen not to include it in the assessment, as you have not provided any supporting evidence for this specific approach and it does seem to be suggested elsewhere.
375	Erb, John	4		1319	1321	"evidence is scarce"???? Then someone needs to look at the voluminous literature from North America on modern hunting. This statement is clearly false, unless the intent was to ignore a large portion of the world. If so, then say so. Otherwise, delete this false statement.		In fact it was difficult to identify such examples from the literature review, but for the revised version will look at examples from North America.
376	Erb, John	4		2553		Again, the choice of words here focuses on "the impact" of hunting, which presumes a negative effect. There may be POTENTIAL for negative impact, but also positive impact. Also, I would argue that leisure tourism CAN have a greater impact than hunting. For example, tourism CAN impact habitat and if not managed properly CAN have longer impacts than removal of individual animals through hunting.		This section has been heavily revised. We agree with your point that hunting is a practice that could be sustainable and unsustainable. Also, impacts may be positive or negative.
377	Erb, John	4		661		change "indiscriminate" to "poorly regulated"		Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
378	Erb, John	4		667	671	change hunting to "improperly managed hunting". I would guess that global details support this in modern times. I highly doubt the study cited here has many modern examples from North America, where funding and support for monitoring and enforcement are higher.		Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
379	Erb, John	4		2548		clarify you are talking about the role of ILLEGAL wildlife trade, since the example you use is about poaching. Trade can be good, illegal trade is presumably always bad.....or it shouldn't be illegal.		This has been clarified and phrased more carefully.
380	Erb, John	4		45	46	Direct drivers should be clarified as being UNREGULATED OR UNMONITORED commercial harvest. Just because it is "commercial" does not mean it is not sustainable, and there are plenty of examples.		Thank you for this suggestion. We have chosen not to include it in the assessment, as you have not provided any supporting evidence for this specific approach and it does seem to be suggested elsewhere.
381	Erb, John	4		782	784	I think this statement is far too strong in terms of what is required for sustainable harvest. I agree that monitoring and regulations should be science-based, but you do not have to have life history and behavioural data to have sustainable harvest. Basic (but sound) monitoring of the harvest and population is usually sufficient.		Thank you for your comment. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
382	Erb, John	4		3007	3010	I understand the point of emphasis here, and agree, but not everything in your list is "needed" for sustainable harvest. It may be desirable, but only a subset is needed. Knowing harvest levels and having some reliable index of population trend is often sufficient.		Agreed. Thanks.
383	Erb, John	4		2873	2876	I would argue that a non-trivial part of this historic partial truth may simply be the lower population size and lack of technology and infrastructure in past societies, not some superior 'conservation mentality'. This was even pointed out in the previous section on technology. I think alot of this discussion represents an idealized view of religion or indigenous culture, and ignores some other truths.		Agreed. Will try and address this.
384	Erb, John	4		2573		I would say that trade CAN put pressure on wild species in exporting countries, but whether it in fact does depends on local regulations and enforcement. Changing regulations in response to pressure is common in North America, offsetting any pressure from increased trade value.		Good point. We have adjusted this.
385	Erb, John	4		674	681	I would strongly disagree that the scientific literature generally associates hunting with negative ecological consequences, certainly for modern times. If this is true, it certainly does not apply to North America. There also does NOT need to be positive economic impacts or a 'conservation tool' to 'defend' hunting. One only need have social support and demonstrate it is not causing a conservation concern for a species, which is the case for essentially all hunting in at least North America. The last sentence here also implies that there may be only one truth to whether hunting can be a conservation tool, but the answer is almost certainly to vary based on circumstances and how well the hunting is monitored, regulated, and enforced.		Noted. Regional characteristics should be better integrated in the next draft.
386	Erb, John	4		2577		If trade is having biodiversity impacts, it is because it is improperly regulated, not simply because it is trade. I think these distinctions are important to make.		Thanks, this is a good point
387	Erb, John	4		2850		IMPROPERLY MANAGED national and international trade is driving decline....		Point taken
388	Erb, John	4		641	645	Not sure if I am misinterpreting these statements, but to me these lines contain some very biased language. "...generally killed or used in ways that significantly reduce population/availability, such as hunting...." "Hunting" does NOT do this. UNREGULATED OR UNMONITORED harvest may. Also, "Such uses may serve as sources of food, sports, recreation, and entertainment or even as products for commercial use". To imply that this is the only or primary motivation/benefit for hunting, in contradiction to all previous chapters and even the next paragraph, is unwarranted and I would argue very biased. Also, regardless of an individual's primary motivation for hunting, it is the population outcome, not hunter intent, that matters, and hence the important factors are the degree of knowledge/monitoring/enforcement. If I go hunt a deer "for fun", it has no more or less of an impact on the population than if I do it for a subsistence need.		This section has been completely dissolved and was infused in different other sections, in accordance with new restructuring of the whole assessment around the five major practices (Fishing, hunting, timber harvesting, gathering, and non-extractive practices). On addressing hunting authors removed bias language as advised.
389	Erb, John	4		2992	2994	See above comment; there are also examples of historic cultures having negative impacts, even resulting in their societal collapse. So again, I might partially agree with some of what is being said, but it paints a false idealized view of the truth. More balanced discussion of potential negative impacts of religion/culture are needed.		In this section, few sentences support the importance of ILK however, in other subsections, the points of eroding systems have been highlighted. We will try and address this comment in the revised version. Thanks.
390	Erb, John	4		2591		seems to me that trade can increase in revenue in exporting countries as well.		Yes, you are right. We changed that.
391	Erb, John	4		2589		tariffs and taxes are far from needed to control harvest. Harvest regulations (at least in North America) change in response to changing effort/demand; see comment on line 2573 above.		True, this sentence has been removed.
392	Erb, John	4		2863	2865	This seems to be a fairly narrow view. Culture or religion can also drive illegal trade, create war (degrading habitat, harming wildlife, and creating poverty), and harbor views of dominion over animals, all of which can have very negative effects on wildlife and sustainable use.		Thanks for the comment. Agreed with the statement and some of the views are expressed in other sections as suggested.

393	Erb, John	4	724	732	While I don't disagree that lead CAN pose a threat to individual scavengers, the minimal citations you use do not in my opinion support an argument that lead bullets pose a "long term ecological threat to non-target species". Also did not see the Plaza citation in the Reference section). Lead bullet fragments may pose threat to individual animals, but if there is to be a case made that it is a threat to a SPECIES, more defensible examples are needed here. Anything CAN become a threat, but it is not appropriate to focus on negative speculation unless you also use positive speculation (e.g., maybe carcasses from hunter-killed animals benefit scavengers more than they do harm).	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
394	Erb, John	4	1312		Why is the focus here on banning fishing, hunting, etc?? The proper unbiased way to say this is that "...to drive sustainable use (line 1309) includes....proper monitoring and regulation of harvest (which in some cases might include bans on hunting). Some of the language in this chapter is starting to sound more anti-hunting than pro sustainable use.	The language will be revised to make sure that we do not focus only on bans but also on monitoring and regulations.
395	Erb, John	4	780	781	You simply cannot say that trophy hunting.....and other forms of hunting contribute to declines in wildlife populations. This unqualified statement is false as stated. It CAN contribute to declines, and only because it is improperly managed/enforced. If you are not going to offer these clarifications, these types of statements need to be eliminated throughout this document. It is becoming concerning to me that I am finding a large number of unqualified NEGATIVE statements about hunting.	Thank you for the comment. The statement was inferred from a couple of important review papers which concluded hunting as a direct driver of species loss. The section on hunting is being completely dissolved and will be infused in different other sections. Technical suggestions and references will be updated as we work on the next draft.
396	Morgan, David (on behalf of CITES)	4	2600	2613	Another way of influencing non sustainable use may be through a process of setting and controlling quotas in trade. This form of intervention is frequently used in CITES.	We have added this point.
397	Morgan, David (on behalf of CITES)	4	1336	1336	The Migratory Birds Convention (Canada and USA) was signed in 1916; a similar time frame for the migratory birds treaty between USA and Mexico I believe; This agreement was aimed at the protection of migratory bird species (which were at conservation risk due to overexploitation/hunting) and is over 100years old; merits mention in Table 4.1	The table was revised and the Treaty suggested was incorporated
398	Serge Michel Garcia	4	177	178	...but obviously, the earth surface remaining equal, other insects, plants and vertebrates will see their area increase. Right? Otherwise part of the Earth will be azoic?	In the next draft the loss of biodiversity will be brought to the fore, not just the decline in species population.
399	Serge Michel Garcia	4	1416	1416	4.2.3.4. Formal Governance Systems. The global governance system and particularly the articulation between the United Nations General Assembly, the regional commissions and conventions, the State parties and the national stakeholders and communities is well described in Garcia, S.M., Rice, J. and Charles, A. (Eds) 2014. Governance of marine fisheries and biodiversity conservation. Interaction and coevolution. Cichester, UK. Wiley-Blackwell: 511 p.	The chapter is corrected addressed (at least temporarily). Maybe some parts will move to sections "Conclusions and recommendations" and/or "Gaps and challenges" in the same chapter
400	Serge Michel Garcia	4	836	836	Before Sumaila reference the reference given above (Garcia and Newton 1997 could be added as it was the first global bioeconomic model utilisation). An often cited reference is also The World Bank. 2009. The sunken billions. The economic justification for fisheries reform. World Bank (Washington) and FAO (Rome): 100 p.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
401	Serge Michel Garcia	4	144	145	Climate change and ecosystem degradation are separated in this sentence. I would have thought that IPBES would have finally dispelled the mystification presently running in the literature. Climate change is a consequence of pollution.. It is an element of ecosystem degradation and not something else that happened by "chance"	Ecosystem degradation here is primarily dealt with the land and soil degradation.
402	Serge Michel Garcia	4	229	231	climate change is also a driver of invasive species, forcing biodiversity to migrate at various speeds as their environment is modified. Many of these "invasive" species have reached high abundance levels and are not the basis for established fisheries (in the Eastern Mediterranean)	We agree that climate change is driver of invasive species. We will have a separate section about the interaction between drivers.
403	Serge Michel Garcia	4	619	619	Here, climate change is treated correctly as an "environmental driver". This was not the case above. I note that, strangely enough, all references to climate change indicate negative effects, as if no species, presently constrained by the old climate will expand and flourish under a changed climate. This is really odd and unbalanced.	I did not write this part, but suggest that when this section is revised, that this be addressed.
404	Serge Michel Garcia	4	1796	1796	In coastal fisheries, the migration of fishermen has been a characteristic for centuries, to follow the seasonal migrations of their target resources (e.g. in UK herring fisheries; in Northwest Africa and in the Gulf of Guinea. Migrant fishers (who are the real holders of ILK in fisheries) are however considered now a problem when participation to decision-making and distribution of tenure rights are at stake	Will add this important point. One additional issue related to this is that migrant fishers are often foreign nationals, making international agreements vital for transboundary resources
405	Serge Michel Garcia	4	171	204	In line with my comment above, I see again climate change treated as if it was not an environmental driver. However, it is an indirect driver of human pollution, mediated by GHGs. It is a dramatic consequence of pollution.	It is less that climate change is an indirect driver of pollution, it is more that efforts to reduce human-caused climate change are similar to those required to reduce pollution, including the need to reduce consumption of products and services.
406	Serge Michel Garcia	4	585	585	It would be useful to at least remind the reader that climate change is a manifestation of pollution, even if treated separately due to its global (and hardly "tractable") nature	Thank you for your comment. We add climate affects the structure of an urban forest (Sanders,1984, Tratalos, et.al.,200) as do pollutant types and concentrations( Harris and Manning, 2010).
407	Serge Michel Garcia	4	1368	1370	Other effective Area-based conservation measures (OECMs) referred to in CBD Target 6 is also worth mentioning. Also LMMAs (Locally managed marine areas) as a form of traditional tenure (particularly in the Pacific Ocean)	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
408	Serge Michel Garcia	4	359	387	Soil mobilization (consequence of agriculture AND public works results in sediment transport to the ocean and loss of transparency, death of corals and seagrass beds. Water diversion has led to a substantial decrease of water flow in the ocean, the effect of which on productivity-rich estuaries and coastal areas have not been properly assessed?	We agree that we are dearth of expertise in marine and aquatic ecosystems. We will take care of marine part in revised version.
409	Serge Michel Garcia	4	1337	1337	Table. Need to add 1982-UnConvention on the Law of the Sea and 1995 Un Fish stock Agreement or, in full title: The Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UN Fish Stocks Agreement). I also note that all the United Nations summits (UNCHE, UNCED, WSSD, etc.) are missing despite their high driving roles.	Will add these and other driving agreements
410	Serge Michel Garcia	4	168	168	The number of fish species in the figure is odd. It is close to the number of species reported to FAO as being caught, but quality stock assessments indicate that only a third of the world marine stocks are overexploited (few inland stocks are assessed). Certainly not 1,100 species. Discussions are ongoing to compare the two approaches and, as illustrated in a recent study in the Mediterranean, the IUCN data may even be more optimistic than real stock assessments (Frenandes et al. 2019)	This figure is adopted from Maxwell et al. (2016). We will update the number. Thank you.
411	Serge Michel Garcia	4	2416	2416	The reference Elinor et al., 1999, is in reality Ostrom et al. 2019 as "Elinor" is the first name of OSTRUM. The style of the reference in the ref list (and use of commas) is confusing	Thank you. It was corrected.
412	Serge Michel Garcia	4	830	830	The reference to Swartz et al. 2010 could be completed by an earlier and more fundamental one: Garcia, S.M. and Newton, C. 1997. Current situation, trends and prospects in world capture fisheries. In: Pikitch, E.L., Huppert, D.D. and Sissenwine, M.P. (Eds.). Global trends: fisheries management. Seattle, Washington, U.S.A, 14-16 June 1994. Bethesda, Maryland. American Fisheries Society Symposium 20: 352 p.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
413	Serge Michel Garcia	4	698	710	There has been examples, also, of transfer of consumption to bush meat when fishery stocks collapsed reducing meat supply.	Thank you for your comment. The feedback is greatly appreciated by the chapter authors.
414	Serge Michel Garcia	4	1485	1491	There is a very detailed description of the shifts in governance styles and of the convergence of these changes in fisheries and biodiversity in the reference above (Garcia, Rice and Charles, 2014)	Citation added
415	Serge Michel Garcia	4	2447	2557	This is correct, but with globalization, traditional social economies drift surreptitiously towards market economies, in which large small-scale fisheries process massive amounts of fish for local consumption and for export (fresh or process) across the world. They then tend to behave according to such market economy.	Yes ! there are opportunistic strategies developed by small-scale fishers ( example: fining fishery) but also more responsible strategy, based on TEK/LEK.
416	Serge Michel Garcia	4	222	224	With climate change, the biogeography of Earth is changing and animals move (fishes have moved thousands of kms already, BECAUSE THEIR CLIMATE HAS CHANGED. Are they considered as "invasive"? Are we supposed to counter their ecological migration? They are the NEW "resident" species.	Your point is interesting but we follow the definition of convention of biodiversity.

















