

Comments received during the external review of the first order draft of the summary for policymakers of the thematic assessment of invasive alien species and their control. The review period was from 15 December 2021 to 15 February 2022							
Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Albert, Arnaud	Summary for policymakers	0	0	0	0	It would be necessary to bring a population scale approach to this SPM.	Thank you for your comment, this has been dealt with by replacing the term "invasive alien species" by "biological invasions", where appropriate in the second order draft of the SPM
Albert, Arnaud	Summary for policymakers	0	0	0	0	Clarification is needed on the distinction between invasive alien species and alien species.	Thank you, this has been clarified in Figure SPM.1 and the definition, in the introduction of the second order draft
Albert, Arnaud	Summary for policymakers	0	0	0	0	Need to be more precise on the description of the introduction and spread stages.	Thank you, we have added an introductory part to address this comment in the second order draft of the SPM
Albert, Arnaud	Summary for policymakers	0	0	0	0	The SPM has a lot of good ideas, however the Key Messages are not yet clear regarding the recommendations. There should be more messages with specific recommendations for each type of decision-makers (public sector, private sector, third sectors, etc.) Revise the text to be less "heavy", easier for policy makers to understand.	Thank you, we will improve the key messages but will remain policy-relevant (and not policy-prescriptive), as per IPBES' mandate
Albert, Arnaud	Summary for policymakers	0	0	0	0	The term eradication should be moderate as a target by eradication or local control. Eradication is utopic and should not be used in this context. We should use instead the term "local management" or "mitigation". If we are to use the term eradication, we should define at which scale it is correctly applied.	Thank you, we think the term eradication will be easier to understand for policymakers.
Albert, Arnaud	Summary for policymakers	0	0	0	0	We appreciate the enormous amount of work done for this SPM and congratulates the authors.	Thank you for your feedback.
Bharat, Alka	Summary for policymakers	0	0	0	0	Add ; scenario building of invasive Alien species introduction and growth ; Add infographics	Thank you for your comment. Projections under different scenarios are largely lacking, which is presented in the knowledge gaps synthesis.
Bharat, Alka	Summary for policymakers	0	0	0	0	Climate variability a responsible driver	Thank you for your comment. This assessment follows the categorization of drivers of biodiversity change from the previous IPBES assessments, including climate change.
Calderón, Isabel	Summary for policymakers	0	0	0	0	In the SPS Committee, WTO Members are currently holding discussions on an SPS Declaration on "Responding to Modern SPS Challenges". This can also be considered as a successful example of information sharing and constructive debates to tackle the challenges associate to trade. Discussions by Members have specifically referred to invasive species, as shown in WTO official document G/SPS/GEN/1960.	Thank you for sharing this example. This topic is covered in Chapter 6.
Calderón, Isabel	Summary for policymakers	0	0	0	0	Please note that the Standards and Trade Development Facility (STDF) has undertaken work on the topic that could be of relevant. The International Plant Protection Convention (IPPC) and the World Organisation for Animal Health (OIE) have also undertaken relevant work on IAS, and are important fora and repository of information. It is indicated in line 826, but is also relevant also in other parts of the document. WTO Members are encouraged in the SPS Agreement to base their measures in standards developed by these international organisations.	Thank you, this has indeed been covered in Chapter 6
Calderón, Isabel	Summary for policymakers	0	0	0	0	The FAO Global Action for FAW Control can be cited as an example of successful collaboration.	Thank you, this is mentioned in the chapters but the SPM may not include too many specific examples of decision support tools in the second order draft
Curd, Amélia	Summary for policymakers	0	0	0	0	A session from IUCN World Conservation Congress in September 2021 was dedicated to best practices and solutions to tackle marine invasive species. It identified concrete actions available. Such possible actions and measures should appear clearly in the SPM, e.g. in the table mentioned by Roseli Pellens to present concrete actions. A report from the IUCN session will be published soon, you can contact the facilitators of the session if you would like more information: https://www.iucncongress2020.org/programme/official-programme/session-43188	Thank you, a table with concrete management actions has been added to the second order draft of the SPM following this suggestion.
Dommanget, Fanny	Summary for policymakers	0	0	0	0	We appreciate the enormous amount of work done for this SPM and congratulates the authors.	Thank you for your feedback.
EL Houdi, Khadija	Summary for policymakers	0	0	0	0	Genetal comment: The report need to be more synthetised, with the recommendations and messages to policy makers, decisions to be taken clearly stated. All the graphs and diagrams and scientific representation should be put in an annex to this report	Thank you for your comment, we have revised the second order draft of the SPM to make it more synthetic, but will keep the figures as they are an integral part of the SPM. The assessment report is mandated to provide policy-relevant information, not policy recommendations, so we would not be able to make the recommendations suggested.
Evans, Thomas	Summary for policymakers	0	0	0	0	Just as a general comment, there are some very long sections of text all the way through this document. Maybe this is a formatting requirement. If not, perhaps someone could cast an eye over the longer sections and split them up a little. Personally I find long sections of text much harder to read.	Thank you, we have shortened some sections and simplified the language of the second order draft of the SPM
Fagot, Cédric	Summary for policymakers	0	0	0	0	A short introduction is missing in the beginning of the document to give information regarding topic and target of this document. The SPM lacks a figure or a sentence to describe the interactions of IAS with the drivers of biodiversity loss. Add 3 or 4 lines to explain what is actually the purpose and objectives of this assessment/SPM in the Introduction.	Thank you for your comment. Following previous IPBES assessments, forewords will be added after the Plenary approval, with reference to the scoping document. An introduction has been added and authors have elaborated on the links between drivers of biodiversity change and IAS.
Fagot, Cédric	Summary for policymakers	0	0	0	0	Clarification is needed on the distinction between invasive alien species and alien species.	Thank you, this has been clarified in Figure SPM.1 and the definition, in the introduction of the second order draft
Fagot, Cédric	Summary for policymakers	0	0	0	0	Invasive Alien Species is written 282 times, I suggest to use IAS	Thank you, but the use of acronyms and abbreviation has been minimized, following the UN editorial guidelines.
Fagot, Cédric	Summary for policymakers	0	0	0	0	Need to be more precise on the description of the introduction and spread stages.	Thank you, we have added an introductory part to address this comment in the second order draft
Fagot, Cédric	Summary for policymakers	0	0	0	0	The SPM has a lot of good ideas, however the Key Messages are not yet clear regarding the recommendations. There should be more messages with specific recommendations for each type of decision-makers (public sector, private sector, third sectors, etc.) Revise the text to be less "heavy", easier for policy makers to understand.	Thank you, we will improve the key messages but will remain policy-relevant (and not policy-prescriptive), as per IPBES' mandate
Fagot, Cédric	Summary for policymakers	0	0	0	0	The term eradication should be moderate as a target by eradication or local control. Eradication is utopic and should not be used in this context. We should use instead the term "local management" or "mitigation". If we are to use the term eradication, we should define at which scale it is correctly applied.	Thank you, we think the term eradication will be easier to understand for policymakers.
Fagot, Cédric	Summary for policymakers	0	0	0	0	We appreciate the enormous amount of work done for this SPM and congratulates the authors.	Thank you for your feedback.
Government of Argentina	Summary for policymakers	0	0	0	0	In several sections, the document refers to "drivers of global change", "drivers of change", "drivers of environmental change" and "drivers of biodiversity change". This diversity of references causes confusion. We suggest to unify the references, in line with the Global Assessment: "drivers of change"	Thank you for your comment, this has been harmonized in the second order draft of the SPM.

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Government of Argentina	Summary for policymakers	0	0	0	0	We recommend to bring some reflection from Chapter 1 to the Summary of policy maker. In particular, reflections of chapter 1, lines 1129 to 1135: They have shown that although species have always migrated across ecosystems, species movement accelerated from the eighteenth century onwards due to the mobilisation of global agriculture, the extraction of biological matter for 'exotic' horticulture, and land use change (Thomas, 1984; Robbins, 2002; Ritvo, 2014; Bewell, 2017). Historians have described this advent of species movement 'the Colombian exchange' (Crosby, 1972) and 'ecological imperialism' (Crosby, 1986); few would disagree that imperial capitalism has been and continues to be the main driver of species introductions, including those now driven by climate change.	Thank you, Chapter 1 provides context but the SPM mostly focuses on key findings from this assessment
Government of Argentina	Summary for policymakers	0	0	0	0	What is the difference between invasive alien species and biological invasions? It should be clarify the way in which both concepts are used	Thank you, this has been clarified in the introductory section of the second order draft of the SPM
Government of Armenia (Aghasyan, Levon)	Summary for policymakers	0	0	0	0	Some points should be enlarged and provide a bit more information and some points should be shorten. Can be included more figure and graphs to make results more visible.	Thank you, the second order draft of the SPM has been revised accordingly. Following the previous IPBES assessments and in view of the Plenary approval process, we have chosen not to increase the number of figures in the SPM
Government of Canada (Fraleigh, Brad)	Summary for policymakers	0	0	0	0	To enhance clarity, there should be the same number of numbered paragraphs in the Background (Page 9-36) as in the Key Messages (Pages 1-8), or use sub-headings. The paragraph numbers in the Background should correspond to the letter-numbers of the Key Messages.	Thank you for this comment, but one key message is sometimes based on several background paragraph.
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	0	0	0	0	the background section should clearly align point-by-point to key messages section. The same numbering system (A1, A2 and so on) should be applied, and I would go so far as to suggest that the opening statement in bold be repeated at each point.	Thank you for your comment. Because the background section supports the key messages, it needs to be longer (same model than Global Assessment).
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	0	0	0	0	The distinction between key messages C and D is not clear. C focuses on management, and D focusses on a subset of that. Perhaps key message D is that integrated governance could enable better management?	Thank you, we have clarified this and removed overlaps in the second order draft of the SPM
Government of Chile (DIRECTEMAR - Ministry of Defence)	Summary for policymakers	0	0	0	0	As a general opinion of the document, especially in point 20, it briefly points out aspects related to ballast water and biofouling, indicating that it is ineffective and with low compliance. However, in our opinion, the work carried out by the International Maritime Organization (IMO), regarding the preparation of Guidelines and Circulars associated with ballast water and biofouling, is ignored. These issues are under permanent review by the representatives of the member countries and the GESAMP (Group of Experts on Scientific Aspects of Marine Environmental Protection). However, it is necessary to analyze how the work of the CBD is linked to other international forums and its scope at the national level.	Thank you, we have corrected this in the second order draft of the SPM.
Government of Chile (Ministry of the Environment)	Summary for policymakers	0	0	0	0	We suggest adding information about media and social media. The document has no clear information about how media and social media has shaped last 10 years trend. The access to different countries trends and information like wild animals as pets (snakes, otters, felids, turtles). Cinema, like Ninja Turtles promoted having turtles (Trachemys scripta) as pets in many countries. In this sense, it is suggested to review and provide background information and eventually propose a key message about a waring look after new trends, in the SPM.	Thank you, this is included in the chapters of the second order draft of the SPM
Government of Chile (Ministry of the Environment)	Summary for policymakers	0	0	0	0	It is striking that among the strategies mentioned to stop, reduce, or control the entry, establishment and movement of invasive alien species, there is no explicit synergistic link with the restoration of landscapes and ecosystems. Curiously, restoration plans tend to consider exotic species as a threat and, for the same reason, they tend to take them into account and address them with actions to eradicate them or at least slow their advance or reduce the damage they cause. This link between IAS and Restoration could help to optimize public policy objectives, also contributing to the achievement of the objectives of the United Nations Restoration Decade. In this sense, it is suggested to review and provide background information and, by virtue of this, eventually propose a key message in this direction, in the SPM.	Thank you, we have now better included this theme (restoration) in the SPM and in the chapter. Please refer to Section C of the SPM for more information.
Government of Chile (Ministry of the Environment)	Summary for policymakers	0	0	0	0	We suggest adding historical information from the las 50 years. Even though in the line 442 it has been mentioned "historically important drivers" those are more associated to first need industry. Nevertheless, more recent trends, like fashion and travels are not included. The document is missing information about recent trends (last 50 years). Fur fashion, for example, is one of the reasons why Chile has American mink and beaver, or why in UK coypu is an invasive species. In this sense, it is suggested to review and provide background information and eventually propose a key message about a waring look after new trends, in the SPM.	Thank you for this comment - this section has changed substantially in the second order draft of the SPM but we have added context on dates throughout.
Government of Chile (Ministry of the Environment)	Summary for policymakers	0	0	0	0	We suggest adding some missing terms in the Glossary: line 229 "One Biosecurity", line 342 "Quality of life". Other terms used in the document, for example "aquatic", do not specify if the phrase or content is talking about freshwater, ocean, sea, or all of them.	Thank you, we have improved the glossary and clarified in the draft when using the term "aquatic"
Government of Estonia (Otsus, Merit)	Summary for policymakers	0	0	0	0	I miss some figure or box with brief overview of the biological mechanisms (competition, predation, changing of abiotic conditions, spread of diseases, etc) how IAS affect native biodiversity. Figure 6 nearly fulfills the aim but it is not directly focussed on that.	Thank you. Mechanisms are described in Chapter 4. We have added a few words in the SPM to answer this comment, and we have added a figure presenting invasion stages.
Government of Estonia (Otsus, Merit)	Summary for policymakers	0	0	0	0	Please touch briefly the issue of assisted migration of species (believed to be a biodiversity conservation measure to combat negative effects of climate change) and how it relates to IAS	Thank you, assisted migration is covered in Chapter 3, but the length restriction of the SPM does not allow us to included it there
Government of Estonia (Otsus, Merit)	Summary for policymakers	0	0	0	0	Topic of traits of species related with invasiveness could be briefly dealt with, even if the knowledge is very incomplete or no clear patterns do exist.	Thank you for this comment - as you note information is incomplete but we have included discussion of this within Chapter 1 of the second order draft of the SPM
Government of Finland (Niemiuvoo-Lahti, Johanna)	Summary for policymakers	0	0	0	0	Where are all the recommendations of this assessment? Several concrete recommendations would help to further promote the most important / priority next steps to be taken globally/regionally/nationally/locally.	Thank you, the SPM has been revised to be more solution-oriented but will remain policy-relevant (and not prescriptive), as per IPBES' mandate
Government of France	Summary for policymakers	0	0	0	0	It would be necessary to bring a population scale approach to this SPM.	Thank you for your comment, this has been dealt with by replacing the term "invasive alien species" by "biological invasions", where appropriate in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of France	Summary for policymakers	0	0	0	0	A session from IUCN World Conservation Congress in September 2021 was dedicated to best practices and solutions to tackle marine invasive species. It identified concrete actions available. Such possible actions and measures should appear clearly in the SPM, e.g. in the table mentioned by Roseli Pellens to present concrete actions. A report from the IUCN session will be published soon, you can contact the facilitators of the session if you would like more information: https://www.iucncongress2020.org/programme/official-programme/session-43188	Thank you, a table with concrete management actions has been added to the second order draft of the SPM following this suggestion.
Government of France	Summary for policymakers	0	0	0	0	A short introduction is missing in the beginning of the document to give information regarding topic and target of this document. The SPM lacks a figure or a sentence to describe the interactions of IAS with the drivers of biodiversity loss. Add 3 or 4 lines to explain what is actually the purpose and objectives of this assessment/SPM in the Introduction.	Thank you for your comment. Following previous IPBES assessments, forewords will be added after the Plenary approval, with reference to the scoping document. An introduction has been added and authors have elaborated on the links between drivers of biodiversity change and IAS.
Government of France	Summary for policymakers	0	0	0	0	Clarification is needed on the distinction between invasive alien species and alien species.	Thank you, this has been clarified in Figure SPM.1 and the definition, in the introduction of the second order draft
Government of France	Summary for policymakers	0	0	0	0	Invasive Alien Species is written 282 times, I suggest to use IAS	Thank you but the use of acronyms and abbreviation has been minimized, following the UN editorial guidelines.
Government of France	Summary for policymakers	0	0	0	0	Need to be more precise on the description of the introduction and spread stages.	Thank you, we have added an introductory part to address this comment in the second order draft
Government of France	Summary for policymakers	0	0	0	0	The SPM has a lot of good ideas, however the Key Messages are not yet clear regarding the recommendations. There should be more messages with specific recommendations for each type of decision-makers (public sector, private sector, third sectors, etc.) Revise the text to be less "heavy", easier for policy makers to understand.	Thank you, we will improve the key messages but will remain policy-relevant (and not policy-prescriptive), as per IPBES' mandate
Government of France	Summary for policymakers	0	0	0	0	We appreciate the enormous amount of work done for this SPM and congratulates the authors.	Thank you for your feedback.
Government of Germany	summary for policymakers	0	0	0	0	General comment: Content Imbalances - The issue of gene drive organisms as management options are presented in an imbalanced manner. While during the NFP-dialogue is has been stressed by the authors how important it is to present potential future options this new technology might offer at some point in time, along with all risks and concerns attached to it in equal manner - this seems a little biased towards the potential future options. It is suggested to overcome these imbalances.	Thank you, we have revised the second order draft of the SPM accordingly
Government of Germany	Summary for policymakers	0	0	0	0	General comment: In the Background, the chapter source and/ or confidence level(s) to the statements made are often missing. Please include both in the revised version of the document.	Thank you, this has been fixed in the second order draft of the SPM
Government of Germany	Summary for policymakers	0	0	0	0	General comment: Just to be sure: The SPM SOD will include appendices on (1) the communication of the level of confidence, (2) the conceptual framework, (3) a list of relevant definitions and/ or (4) an SPM-specific glossary?	Thank you, the second order draft of the SPM includes the appendices on the communication of the level of confidence, the conceptual framework and the assessment glossary (one glossary for the entire assessment). It also includes an introductory part with definitions of native, alien and invasive alien species
Government of Germany	summary for policymakers	0	0	0	0	General comment: Literature - While English publications have been taken up, papers and also grey literature in other languages fall short. This seems to be a weakness, since many observations regarding IAS on-site are not necessarily published in English peer-reviewed papers. This might also explain some imbalances regarding the regional setting of case studies or examples presented in the assessment.	Thank you, these biases are explicitly mentioned in the chapters.
Government of Germany	Summary for policymakers	0	0	0	0	General comment: Please ensure that all technical terms are clearly defined when they are used for the first time in the SPM. While we welcome the existence of a glossary document, we still think that the SPM should be understandable as it stands - without having to refer to the technical document. Some definitions are already given but appear to be scattered within the SPM (for instance "invasive alien species"), some definitions seem to be missing altogether (for instance, "biological invasions"). Please make sure that all definitions allow a clear separation between terms (e.g. invasive alien species vs. alien species) and use the terms consistently throughout the entire report.	Thank you, we have addressed this comment by adding an introductory part outlining important definitions and terms, and by simplifying the language in the second order draft of the SPM
Government of Germany	Summary for policymakers	0	0	0	0	General comment: Please stick to the KISS rule - Keep it short and simple. In general, several sentences are much too long, nested, and difficult to understand, especially for the main target group of the SPM. Those should be split into two or three sentences. The approach, one sentence, one statement, should be used if possible.	Thank you, we have simplified the language and made the SPM more accessible.
Government of Germany	summary for policymakers	0	0	0	0	General comment: Regional imbalances - The use of case studies and examples seem a bit unbalanced. E.g. Asia, Africa and some parts of the Pacific seem underrepresented.	Thank you, we have reduced these regional imbalances in the chapters and in the second order draft of the SPM
Government of Germany	Summary for policymakers	0	0	0	0	General comment: We feel that there is a certain imbalance between the identification and relevance of significant knowledge and data gaps on IAS on the one hand (see e.g. Table SPM 1 for a detailed overview of all the areas where research and data are missing) and the definitive formulation used in many of the key messages (and to a lesser extent this applies to the background chapter as well) on the other hand which suggest that there exists sufficient evidence. Therefore, we encourage the authors to cross-check throughout the document whether there are statements and numbers which might need to be formulated more carefully given that there are still many data and knowledge gaps on regions, taxonomic groups, inventories, net effects of multiple interacting drivers and feedback loops - to name a few.	Thank you, in the second order draft of the SPM, we have reframed the knowledge gaps paragraphs to clarify that action do not need to wait for these gaps to be closed and that we have sufficient and well established knowledge on biological invasions. Additionally, we have revised the confidence statements where not appropriate
Government of Germany	Summary for policymakers	0	0	0	0	General comment: We very much welcome and acknowledge the work of the co-chairs, authors, the Secretariat and the TSU regarding this important assessment. The SPM seems to be a comprehensive and useful product with well-chosen messages from the chapters. However, not all the messages are clearly formulated. While the figures are generally appealing, the text still seems immature when it comes to language but partly also content. We have identified some inconsistencies especially concerning the use of numbers in the SPM. We note with appreciation that plenty of the comments from the review of the FOD of the chapters have been addressed and relevant literature has been taken into account. The introduction of the glossary is also very much welcomed.	Thank you for the positive feedback. The SPM has been revised to be more policy-relevant.
Government of Germany	Summary for policymakers	0	0	0	0	General comment: We were wondering whether the attribution of impacts to IAS as major driver is as straightforward as it appears in the SPM. Some of the really alarming numbers of the SPM - 44% of extinctions where IAS are the major driver and 1.7 trillion US\$ of global costs which are attributed to biological invasions for the last 50 years - portray an impression of certainty. The identified knowledge gaps in table SPM 1 on "net effects of multiple interacting drivers and feedback loops" and the complexity and context-specific nature of social-ecological systems might suggest that there are substantial uncertainties around these numbers. Therefore we would encourage the authors to communicate these numbers more carefully reflecting adequately uncertainties and data gaps.	Thank you, we have revised the second order draft of the SPM to carefully present these figures. We have also removed the figure on extinctions as it led to misinterpretation and confusion.

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Government of Germany	Summary for policymakers	0	0	0	0	Proposal: Currently, the key messages section does not include visual material. At least one iconic figure should emerge from this assessment to convey the key messages among various stakeholder communities, including media. It is therefore strongly recommended that meaningful figures be included in this section containing the key messages. For example, we suggest that figures SPM.1 and SPM.5 in the background section should be moved to the key messages section.	Thank you, we will follow previous IPBES SPM' structure and keep most of the figures in the background section. We have however added an introductory part, that includes the definitions figure
Government of Germany	Summary for policymakers	0	0	0	0	Proposal: Invasive alien species cannot be characterized by an independent phenomenon, overall, it is also caused/exacerbated by human-induced drivers, such as (human-caused) climate change. We feel that the assessment and its SPM transmit the impression that invasive alien species are the main driver for the decline/extinction of native species; even though invasion of alien species is not a stand-alone natural process but is often made more likely and more intense by e.g. human-induced climate change. Thus, it is suggested to expand this often narrow attribution while considering other drivers of such degradation of nature, NCP and good quality of life. Please also see other more specific comments on this issue below.	Thank you, this has been corrected in the second order draft of the SPM
Government of Germany	Summary for policymakers	0	0	0	0	Proposal: It is suggested to add a definition of "alien species", "invasive alien species", and "biological invasions" at the very beginning of the SPM (see Fig. 1 SPM on page 10) in order to make sure that all readers (foremost also policy makers as main target group) exactly know what is meant by that term. Does the term "biological invasions" include the deliberate and accidental introduction of alien species? Furthermore, the IPBES definition of invasive alien species should be included in the document: Invasive alien species are defined as animals, plants or other organisms introduced directly or indirectly by people into places out of their natural range of distribution, where they have become established and dispersed, and generating an impact on local ecosystems and species (IPBES, 2018a).	Thank you, we have revised the second order draft of the SPM in line with this comment
Government of Germany	Summary for policymakers	0	0	0	0	Proposal: The way the SPM is now structured, the reader immediately stumbles into the key messages section without being introduced to the topic, scope, and objectives of the IPBES invasive alien species assessment. Clearly, we need to understand the problem before we can get to the key messages. We therefore propose to include an introduction /a preamble that addresses aspects such as the difference between "alien species" and "invasive alien species," including their definitions, to inform the reader at the outset that this IPBES assessment is focused on "invasive alien species". For this purpose, we recommend to move the required definitions from the background chapter to the start of the SPM, and also add a point about the complexity of the issue because IAS may also have benefits or services (see L250). In this context, it may also be necessary to explain how "impact" is defined in the context of IAS and whether the definition of impact considers the multiple perspectives of the different stakeholders relevant to IPBES. In light of these definitions, it will also be critical to introduce the relationship between IAS and climate change (see also L446-L448, which states that "...the increasing impacts of climate change [...] have increasingly shaped trends in IAS as well."). We also believe that it is important to provide information on the availability of knowledge that made this assessment possible despite the numerous knowledge gaps listed in Table SPM.1. Alternatively, you may want to provide a compact glossary attached to the SPM that explains the terms and abbreviations specifically used in this summary. For instance, it may not be immediately clear, what is meant by "biological invasions" etc. Rationale: The information in the SPM should generally be comprehensive without having to search for definitions in the background section, or the technical report.	Thank you, we have revised the second order draft of the SPM accordingly
Government of Ireland (Nelson, Brian)	Summary for policymakers	0	0	0	0	Overall some sections of the SPM are difficult to read and follow as the language used is often technical, but jargon should be avoided or, if used, it should be explained in the glossary. Simple English should be used wherever possible, that will make messages easier to convey and make translation into other languages less challenging.	Thank you, we have revised the draft accordingly in the second order draft of the SPM
Government of Mexico (Saad Alvarado, Laura)	Summary for policymakers	0	0	0	0	Maybe use the acronym IAS and the full term invasive alien species alternately throughout the document	Thank you, the use of acronyms and abbreviations has been minimized in the second order draft of the SPM, following the UN editorial guidelines
Government of Mexico	Summary for policymakers	0	0	0	0	While I understand that key messages A and B provide a diagnose on the current situation, they seem to convey the message that there is not much to do. It is important to send a clear message that the situation is serious and needs urgent attention, but also provide some hope that not everything is lost. These messages discourage action to control or reverse the situation.	Thank you for your comment, we have revised the second order draft of draft accordingly
Government of New Zealand (Perry, Joanne)	Summary for Policymakers	0	0	0	0	SPM FOD general comment - this is a comprehensive SPM FOD. One area that is lacking however is provisions that reflect IPBES conceptual framework and in particular advice relating to the interaction of indigenous people and local communities, not only with how they view and enage with invasives, but ways in which there conceptual frames can be actualised in decision making and management of invasives into the future. This is touched on in the chapter relating to natures contribution, but not nearly as effectively as it should be. it would be useful to include a specific section in the spm that soley reflect their conceptual framework. The SPM also fails to address the tensions that exist between IAS affected industries like agriculture and horticulture versus those affecting the wider natural environment. often erradications attempts are undertaken for economic "invasives"versus environmental "invasives". The lack of informaiton on the potential affects on the natural environment means that the cost benefit related to undertaking a response is tipped towards industry but not those invasives likely to establish in the natural environment. This tension has played out in NZ on numerous occasions and has meant that other agencies have needed to step into the gap and try and erradicate or manage the pest towards long term erradication. Great white butterfly response is a perfect example where a leadbiosecurity agency chose not to lead a response yet another came in and ensured a successful erradication. https://www.doc.govt.nz/news/media-releases/2016/great-white-butterfly-eradication-success/	Thank you for this suggestion. We hope that our inclusion of IPLC within distinct key messages has addressed this in part and acknowledging the importance of IPLC and stakeholders throughout.
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	0	0	0	0	There is a wealth of experience and evidence that indicates what might be achieved by studying the successes and failures of both the plant health and animal health regimes worldwide; however, these are mentioned only briefly towards the end of the key messages and background. Given these regimes face similar problems, are far more well established and have achieved considerably more success it would be useful to consider what the similarities and differences are (presumably a key difference is the amount of resources available to each) and whether it would be useful to emulate any of their practices, policies and structures.	Thank you, this is included in the chapters, but also goes beyond the mandate of this assessment so cannot be covered in depth,
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	0	0	0	0	Can the 40% rise in alien species in the period 1970 and 2015 be put into more meaningful terms - for example how many new alien species are introduced around the world each year?	Thank you, we have specified this figure (2 new alien species every 3 days) in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of UK (GB Non- native Species Secretariat)	Summary for policymakers	0	0	0	0	<p>Overall, the core message of the IPBES report appears to be that:</p> <ul style="list-style-type: none"> • IAS are a major threat to biodiversity, people and economies; • there has been little progress made to tackle them; • yet, they could be tackled if the ambition and resources were found to do so; • a step change is therefore needed to address the threat; • this could learn from other biosecurity disciplines such as plant and animal health in line with the principles of One Health. <p>However, this is largely lost in the length of the text and obscured by other more minor points and issues. The key messages need to be made much more clearly and succinctly.</p>	Thank you, we have revised the second order draft of the SPM accordingly to ensure clarity.
Government of UK (GB Non- native Species Secretariat)	Summary for policymakers	0	0	0	0	Quantification of how the natural rate of colonisation is speeded up by man would be very useful – there are excellent studies from islands (Hawaii – 5,000 times the rate of natural colonisation for plants, Gough Island (Tristan da Cunha) – 20,000 the rate for winged insects).	Thank you for this suggestion. We have included rates of new arrivals on a global scale but do not have sufficient data to follow your suggestion.
Government of UK (GB Non- native Species Secretariat)	Summary for policymakers	0	0	0	0	<p>Reference to new and innovative technology is a distraction from more important barriers to achieving successful IAS management. New technology will undoubtedly be useful, but it is not the reason the international community has made little progress to date. Good examples of management without this technology exist, demonstrating that with the correct resources and ambition it is possible. Indeed, the plant and animal health regimes have been highly successful in managing a similar scale of challenge because they are well organised and resourced – not because they have new technology. We suggest that innovative technology is briefly referenced in the key messages and that a much stronger focus is on the key barriers to management – primarily resources and ambition.</p>	Thank you for this suggestion. We have edited this section substantially and achieved a better balance in the second order draft of the SPM
Government of UK (GB Non- native Species Secretariat)	Summary for policymakers	0	0	0	0	The global response to IAS is woefully inadequate to combat the growing threat – this does not come across strongly enough. Hence the need for vastly more resources especially aimed at prevention does not come across sufficiently strongly.	Thank you, we have revised the wording to clarify this key message in the second order draft of the SPM
Government of UK (GB Non- native Species Secretariat)	Summary for policymakers	0	0	0	0	The key messages are too long, repetitive and in places are unnecessarily vague or caveated. For example line 5 “approximately 10% of alien species are considered as invasive” could simply be “approximately 10% of alien species are invasive”. They should be shortered, repetition removed and messages made more direct.	Thank you, we have removed the overlaps in the second order draft of the SPM
Government of UK (GB Non- native Species Secretariat)	Summary for policymakers	0	0	0	0	<p>The key messages section almost entirely lacks actual quantified key messages. For example, in the seven pages of text we could only find four references to numeric information: line 5 - 10% of aliens are invasive (repeated elsewhere), line 6 - US\$ 1,738 billion (repeated elsewhere), line 27 – 35,000 alien species recorded globally, and line 71 – 40% rise between 1970 and 2015. Quantification of environmental impact is particularly lacking.</p> <p>There are excellent examples of useful statistics etc. in the background which should be included in the key messages.</p> <p>The following specific points in particular to be mentioned in the Key Messages section:</p> <ul style="list-style-type: none"> • globally IAS are one of the top 5 threats to biodiversity (IPBES global assessment, 2019) • on islands it is the most important threat • it is the leading cause of extinctions (line 276-277). • Even if we stopped all new IAS arrivals/establishments the impact of those already established would continue to rise for decades as they continue to spread. 	Thank you, we have added more quantified key messages in the second order draft of the SPM.
Government of UK (GB Non- native Species Secretariat)	Summary for policymakers	0	0	0	0	<p>The report states that the global economic cost of invasive non-native species is in excess of US\$ 1,738 billion [note this is for a 50-year period]. This figure and the database that supports it has been criticised by numerous scientists and is likely to be several orders of magnitude lower than the true cost.</p> <p>For example, Novoa et al 2021 demonstrate that the original database massively underrepresented invasive non-native plants, with 80% of sources relating to plants having to be added as an update after the database was launched. They highlight that the cost of a single invasive alien plant, <i>Ambrosia artemisiifolia</i>, has been reported to cost the European economy US\$ 4.5 billion per annum. This provides little confidence that the methods used to produce this figure are robust or comprehensive.</p> <p>There is other data from around the world that indicates the true figure is likely to be orders of magnitude higher than that stated in the IPBES review. For example, the annual cost of invasives species to Europe was estimated to be €12 billion in 2013 .</p> <p>We therefore have major concerns about the prominence of the US\$ 1,738 billion and the way it is used in the IPBES review, both in the summary for policy makers and elsewhere. We strongly recommend that the IPBES team take a different approach that uses all relevant studies that have been undertaken in this area. If possible, it would be appropriate to represent the global economic impact with a lower and upper estimate based on all relevant data.</p>	Thank you, we have better introduced the methodology in Chapter 4 and presented this figure with more caution.
Government of UK (GB Non- native Species Secretariat)	Summary for policymakers	0	0	0	0	Where there are limitations to the assessment of global economic impact that result in a known underestimate these should be explicitly stated in the summary for policy makers. This should include, for example, the difficulties associated with assessing indirect economic impacts (e.g. on ecosystem services) and limitation of basing figures solely on numbers reported in the scientific literature.	Thank you, the methodology is available in Chapter 4 - we have introduced the economic figures with more caution in the second order draft of the SPM
Government of UK (Mark Diamond, Environment Agency)	Summary for policymakers	0	0	0	0	The economic case for managing invasive species given in the IPBES report is not very convincing. The cumulative impact of 1.738 US tn is small compared to global trade of 19 US bn per annum (it would be useful for the report to state the annual impact as cumulative impact is difficult to interpret). It is unlikely to impress any economists. It is important to give a more realistic figure, given that countries will not want to slow trade at their borders by allowing more checks unless it's worthwhile. It's evidently worthwhile (at least on occasion) for plant and animal diseases because the economic impacts reported are much greater. Thinking about Australia and New Zealand, are their policies driven most by a desire to protect their natural assets than by the economics (acknowledging that there is some link there)?	Thank you, we have reviewed this point, and presented a different economic figure with more caution in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of UK (Mortimer, Diana)	Summary for policymakers	0	0	0	0	overall - a definition of IAS/AS/biological invasion would be useful - are they synonymous?	Thank you, we have added an introductory part to address this comment in the second order draft of the SPM
Government of UK (Mortimer, Diana)	Summary for policymakers	0	0	0	0	Overall - this is a really great start. There is some repetition in the background sections that could be addressed.	Thank you for your comment, we have revised the second order draft of the SPM accordingly
Government of UK (Mortimer, Diana)	Summary for policymakers	0	0	0	0	Overall comment - It would also benefit from some case studies and where appropriate examples to help the reader visualise the issues.	Thank you, we have added a few examples and referred to more case studies (boxes) from the chapters in the second order draft of the SPM.
Government of UK (Sarah Webster, Defra)	Summary for policymakers	0	0	0	0	The summary for policy makers is FAR too long. It needs to be reduced to about 10% of its current length - ie it needs to be 4 pages max rather than 36, and focused on (1) any NEW findings (as opposed to, for example, the observation that governance is helped by strategic thinking), and (2) what Governments and others need to do about it. It is VERY repetitive - for example the figure of US \$ 1,738 billion is repeated in lines 6, 25, 249 and 300, "overwhelmingly negative/overall negative/more negative than positive" is repeated 12 times and the point about the interaction with climate change is repeated many times. Most policy makers will know that the effects are more negative than positive and that there is an interaction with climate change, so these points only need to be mentioned once. There are many sentences that are far too long, for example the sentences that run from line 301-305, from 366-370 and the one from 844-849. There are places where the English is not very idiomatic (for example the 16 references to "good quality of life", which would read better simply as "quality of life"), and the summary would benefit from a single person with good proficiency in English shortening it and making it more readable. The length, repetitiveness and verbose phraseology represent a real barrier to the report's acceptance and its ability to facilitate much needed change. Some of the tables and figures are good and should be retained - these are more along the lines that are needed - ie facts and figures.	Thank you, we have shortened the SPM and reduced the overlaps, but will continue to follow previous IPBES assessments' structure.
Government of USA	Summary for policymakers	0	0	0	0	In general, we found the key messages in the SPM clear and useful. However, there needs to be more emphasis on practical strategies for control and mitigation in the Key Messages. For example, adding a table with policy options for pathway management, species-based management, and site-based management would be helpful. Perhaps a figure showing some of these options would also be effective.	Thank you for your feedback. We have revised the second order draft of the SPM accordingly.
Government of USA	Summary for policymakers	0	0	0	0	Including a box for definitions (an expansion of the paragraph at the top of Fig 1) would be helpful for differentiating the following terms: 'invasive', 'alien', 'non-native', 'non-indigenous'. Moreover, it might be helpful to distinguish between the level of harm for these categories as not all non-indigenous species are harmful and invasive.	Thank you, we have added an introductory part to address this comment in the second order draft of the SPM
Jactel, Hervé	Summary for policymakers	0	0	0	0	Clarification is needed on the distinction between invasive alien species and alien species.	Thank you, this has been clarified in Figure SPM.1 and the definition, in the introduction of the second order draft
Jactel, Hervé	Summary for policymakers	0	0	0	0	We appreciate the enormous amount of work done for this SPM and congratulates the authors.	Thank you for your feedback.
Lieurance, Deah	Summary for policymakers	0	0	0	0	This is a general comment. I know this is a North American perspective, but we've been having some very deep discussions about invasive species terminology that is harmful to marginalized communities. I believe that at some point we must move away from the term 'alien' as it has very negative connotations here with our immigration politics.	Thank you for this comment, we appreciate your views but we need to follow the instructions laid out in the scoping report, approved by the IPBES member States at their 6th Plenary.
Maillard, Jean- François	Summary for policymakers	0	0	0	0	Clarification is needed on the distinction between invasive alien species and alien species.	Thank you, this has been clarified in Figure SPM.1 and the definition, in the introduction of the second order draft
Maillard, Jean- François	Summary for policymakers	0	0	0	0	Need to be more precise on the description of the introduction and spread stages.	Thank you, we have added an introductory part to address this comment in the second order draft of the SPM
Maillard, Jean- François	Summary for policymakers	0	0	0	0	The SPM has a lot of good ideas, however the Key Messages are not yet clear regarding the recommendations. There should be more messages with specific recommendations for each type of decision-makers (public sector, private sector, third sectors, etc.) Revise the text to be less "heavy", easier for policy makers to understand.	Thank you, we will improve the key messages but will remain policy-relevant (and not policy-prescriptive), as per IPBES' mandate
Maillard, Jean- François	Summary for policymakers	0	0	0	0	We appreciate the enormous amount of work done for this SPM and congratulates the authors.	Thank you for your feedback.
Meslier, Violaine	Summary for policymakers	0	0	0	0	Clarification is needed on the distinction between invasive alien species and alien species.	Thank you, this has been clarified in Figure SPM.1 and the definition, in the introduction of the second order draft
Meslier, Violaine	Summary for policymakers	0	0	0	0	Need to be more precise on the description of the introduction and spread stages.	Thank you, we have added an introductory part to address this comment in the second order draft of the SPM
Meslier, Violaine	Summary for policymakers	0	0	0	0	The SPM has a lot of good ideas, however the Key Messages are not yet clear regarding the recommendations. There should be more messages with specific recommendations for each type of decision-makers (public sector, private sector, third sectors, etc.) Revise the text to be less "heavy", easier for policy makers to understand.	Thank you, we will improve the key messages but will remain policy-relevant (and not policy-prescriptive), as per IPBES' mandate
Meslier, Violaine	Summary for policymakers	0	0	0	0	We appreciate the enormous amount of work done for this SPM and congratulates the authors.	Thank you for your feedback.
Meslier, Violaine	Summary for policymakers	0	0	0	0	We should make the reading easier to the different decision makers. Perhaps bring the Key messages that are more relevant for the first section.	Thank you, we have revised the second order draft of the SPM accordingly, but have retained the four sections in order to increase readability
Participants of ILK dialogue workshop (Gakemotho Satau)	Summary for policymakers	0	0	0	0	In order for a species to be declared as invasive, usually research institutions would develop interest and give regular reports on certain plants, and then governments get involved, and then it is declared an invasive species. Western Botswana umbrella thorn was always there, but now it is spreading into areas where it was not previously. Perhaps farmers do not know grass depletion was due to bushy species, once farming and research society sound the alarm that is when proper research is done to declare them invasive. As an indigenous person I see that this herb is coming in. Unless we engage with research institutions and engage researchers then that is when it can be analyzed and declared as an invasive species and action may be taken. This slows down the process of adaptation and response.	Thank you for sharing this example. Collaboration across institutions is covered in Chapter 6
Participants of ILK dialogue workshop (Guadalupe Yesenia Hernández Márquez)	Summary for policymakers	0	0	0	0	A general comment is to include the mention of the "natural dispersion" of IAS (climate change, hurricanes, etc.).	Thank you, this is hopefully clarified with the definition, but also note that these are including in "natural hazard drivers" in Fig SPM.4

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Participants of ILK dialogue workshop (Guadalupe Yesenia Hernández Márquez)	Summary for policymakers	0	0	0	0	In general, the messages related to indigenous peoples are powerful (634-637, 743-745, 918-936, etc.)	Thank you for your feedback.
Participants of ILK dialogue workshop (Guadalupe Yesenia Hernández Márquez)	Summary for policymakers	0	0	0	0	In the background there are important information that need to be mentioned in the key messages (the overall negative impacts on biological invasions are far greater than the positive impacts 80% ...)	Thank you, this has been revised accordingly in the second order draft of the SPM
Participants of ILK dialogue workshop (Q'apaj Conde)	Summary for policymakers	0	0	0	0	On “stakeholder” engagement – IPLC would consider themselves as ‘rights holders’ rather than stakeholders. Stakeholders might include women, youth and other actors. But IPLCs engage with ILK as rights holders over lands and territories, from a human rights approach, using the Declaration. This needs to be considered throughout the assessment and SPM.	Thank you, we have reflected this in the second order draft of the SPM
Participants of ILK dialogue workshop (Te Tui Shortland)	Summary for policymakers	0	0	0	0	On use of the term “stakeholders”: IPLCs have identified themselves as knowledge holders or rightsholder. A stakeholder could be any member of the public that feels impacted in some way. IPLCs meanwhile identify as separate to that. I am concerned seeing IPLCs put in with stakeholders. This needs to be considered throughout the assessment and SPM. If IPLCs cannot be termed as ‘rights holders’, then I suggest the following wording: “stakeholders and IPLCs” instead of “stakeholders, including IPLCs”.	Thank you, we have reflected this in the second order draft of the SPM
Pellens, Roseli	Summary for policymakers	0	0	0	0	A short introduction is missing in the beginning of the document to give information regarding topic and target of this document. The SPM lacks a figure or a sentence to describe the interactions of IAS with the drivers of biodiversity loss. Add 3 or 4 lines to explain what is actually the purpose and objectives of this assessment/SPM in the Introduction.	Thank you for your comment. Following previous IPBES assessments, forewords will be added after the Plenary approval, with reference to the scoping document. An introduction has been added and authors have elaborated on the links between drivers of biodiversity change and IAS.
Pellens, Roseli	Summary for policymakers	0	0	0	0	Clarification is needed on the distinction between invasive alien species and alien species.	Thank you, this has been clarified in Figure SPM.1 and the definition, in the introduction of the second order draft
Pellens, Roseli	Summary for policymakers	0	0	0	0	We appreciate the enormous amount of work done for this SPM and congratulates the authors.	Thank you for your feedback.
Poulet, Nicolas	Summary for policymakers	0	0	0	0	Clarification is needed on the distinction between invasive alien species and alien species.	Thank you, this has been clarified in Figure SPM.1 and the definition, in the introduction of the second order draft
Poulet, Nicolas	Summary for policymakers	0	0	0	0	It's a complex subject and it's not the role of experts to simplify the subject in this assessment. The SPM should contain all the subjects that represent the complexity of the Invasive and Alien Species.	Thank you, authors have aimed at synthesizing the complexities of biological invasions in the second order draft of the SPM, using simple language.
Poulet, Nicolas	Summary for policymakers	0	0	0	0	Need to be more precise on the description of the introduction and spread stages.	Thank you, we have added an introductory part to address this comment in the second order draft of the SPM
Poulet, Nicolas	Summary for policymakers	0	0	0	0	The SPM has a lot of good ideas, however the Key Messages are not yet clear regarding the recommendations. There should be more messages with specific recommendations for each type of decision-makers (public sector, private sector, third sectors, etc.) Revise the text to be less "heavy", easier for policy makers to understand.	Thank you, we will improve the key messages but will remain policy-relevant (and not policy-prescriptive), as per IPBES' mandate
Poulet, Nicolas	Summary for policymakers	0	0	0	0	We appreciate the enormous amount of work done for this SPM and congratulates the authors.	Thank you for your feedback.
Razafiarison, Fanirisoa	Summary for policymakers	0	0	0	0	It is good to mention in this chapter that the environmental - social - economic domains (basis for sustainable development) are one and the same for finding solutions on invasive species management and policy making by decision makers.	Thank you for your comment, this is further elaborated in Chapter 6.
Soubeyran, Yohann	Summary for policymakers	0	0	0	0	We appreciate the enormous amount of work done for this SPM and congratulates the authors.	Thank you for your feedback.
Stiger-Pouvreau, Valérie	Summary for policymakers	0	0	0	0	Clarification is needed on the distinction between invasive alien species and alien species.	Thank you, this has been clarified in Figure SPM.1 and the definition, in the introduction of the second order draft
Stiger-Pouvreau, Valérie	Summary for policymakers	0	0	0	0	The term "alien" represents a negative notion unlike the term "exotic" in French. It is also difficult to distinguish between alien, non-native or non-local.	Thank you, we follow the scoping document. Note that in French the word "etiquette" will be used. We also made sure to harmonize the draft when discussing alien species.
Stiger-Pouvreau, Valérie	Summary for policymakers	0	0	0	0	We appreciate the enormous amount of work done for this SPM and congratulates the authors.	Thank you for your feedback.
Uludag, Ahmet	Summary for policymakers	0	0	0	0	Horizon scanning and to reach precise result need for biologic and ecologic research should be included	Thank you, this is mentioned in the chapters but the SPM may not include too many specific examples of decision support tools
Uludag, Ahmet	Summary for policymakers	0	0	0	0	Regional networks, especially for underdeveloped parts is important. These networks such as ESENIAS should be supported	Thank you, these are mentioned in Chapter 6 of the second order draft of the SPM
Uludag, Ahmet	Summary for policymakers	0	0	0	0	There is a table in Scalera et al that shows multiple impact of species. It shows although we think there is a one impact, it is more than that. Scalera, R., Genovesi, P., Essl, F., & Rabitsch, W. (2012). The impacts of invasive alien species in Europe. European Environment Agency Technical Report, 16, 114.	Thank you, this issue is covered in Chapter 4 of the second order draft of the SPM
White, Michael	Summary for policymakers	0	0	0	0	Generally OK	Thank you for your feedback.
Verwer, Cynthia	Summary for policymakers	1	39	0	0	Scrolling through this chapter animal welfare is only mentioned once! And in relation to the use of poison and trapping. Animal welfare should be more considered in preventing and controlling invasive species and the effect on non-invasive species (poisoning birds, insects, etc. that are of high value for the existing flora and fauna could impact and reduce biodiversity even more drastic than the invasive species itself). The steps of integrative pest management should be followed taking into consideration the impact on environment and on animal welfare and the effectiveness of the trapping- and killing method.	Thank you, this topic is covered more in-depth in the chapters (especially Chapters 1 and 6). This is the summary for policymakers.

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Diaz, Sandra	Summary for policymakers	1	1	1	1	GENNERAL COMMENT: The SPM is clear and summarizes a lot of really useful information that was previously scattered. The figures are particularly useful and attractive in general. I commend this effort. Following the request of the TSU, I have focused my review mostly on issues related to the IPBES conceptual framework, as well as ome other issues that caught my attention while reading.	Thank you for your feedback, this is very much appreciated
Government of Japan	Summary for policymakers	1	11	1	300	The number of 1,738 billion USD is a key number as the cost caused by invasive alien species, and therefore the description about the number should be more precise and informative. For instance, the SPM should mention that this is the cost over the last 50 years (please see L2394 in Chapter 4). Besides, this SPM mentions the same number for four times in total, though we are wondering if it could also mention other key numbers (particularly cost and/or profit), such as the estimated cost in the future where people do not implement measures against invasive alien species. Such numbers could be helpful to acquire necessary budgets for future measures against alien species in each country.	Thank you, this number has been explained in more details, and repetitions were deleted from the second order draft of the SPM
Outinen, Okko	Summary for policymakers	1	39	1	1018	Summary for policymakers is nicely written with clear key messages. Very good job.	Thank you for your feedback.
Setsaas, Trine Hay	Summary for policymakers	1	8	1	235	It could be important to explicitly address issues related to economic sectors in the key messages, noting that paragraph B6 is relevant in this regard. The summary mentions activities with "economic gain", which is understood as species introduced for a purpose. However, the unintended introduction of species in economic sectors such as transport, mining, tourism, agriculture, forestry etc., should also be addressed. In particular, legal and regulatory tools and other policy options should be addressed in order to manage the invasive alien species threat in these sectors. In addition, the importance of sector involvement, and of ILK, when developing invasive alien species strategies should also be mentioned.	Thank you, we have added a sentence to address this comment in the second order draft of the SPM
Smith, Kevin	Summary for policymakers	1	1	1	1	I would like to see in the Key messages section the definition of an IAS - I know it is explained in line 4 to 6, but I think having an explicit 'and Alien species is...., and invasive alien species is....' would help. I think this is a key opportunity to clearly inform PM on what they are and how they differ from alien species.	Thank you, this has been addressed by adding an introductory section to the second order draft of the SPM
Diaz, Sandra	Summary for policymakers	1	1	2	6	Allien species, technically, are part of nature, so instead of "threat to nature" amd 'impacts on nature", I suggest "threats to native nature" and then "Impacts on native nature"	Thank you, we have decided not to address this comment, as IAS are considered as drivers in this assessment - adding "native" may raise suspicions and complicate the SPM
Government of Argentina	Summary for policymakers	1	2	2	56	Is it correct to say that there is a "bias" in availability of information? We suggest to say that there is uneven ecosystem representation of the information. Bias seems to imply an intentionality behind the lack of information which does not seem to be proved.	Thank you, we have revised the text accordingly in the second order draft of the SPM
Government of Chile (Ministry of the Environment)	Summary for policymakers	1	1	2	2	We suggested to clarify the title adding "Species introduced by human are..."	Thank you. In the second order draft of the SPM, an introductory paragraph with the definition of invasive alien species has been added to clarify.
Government of Estonia (Otsus, Merit)	Summary for policymakers	1	2	2	56	Some of the paras' headline sentences (in bold) could include the fact that biological invasions are caused by humans .	Thank you, we have added an introductory paragraph, with the definition of biological invasion, clarifying that they are caused by human activities. There is therefore no need to repeat this point in the key messages
Romero, José A.	Summary for policymakers	1	8	2	235	Even if they are Key Messages, it seems necessary to use the IPBES metric for the degree of certainty (e.g. likely, etc.) and thus to qualify at least the bold statements in each paragraph A1 ... D7. The statement of the degree of certainty is all the more necessary because not all Key Messages have the same degree of certainty.	Thank you for this suggestion. After careful consideration, the author team choose to follow the previous IPBES assessment's model for consistency and will not add confidence terms for key messages.
Tassin, Jacques	Summary for policymakers	1	1	2	2	Please replace ' a major and growing threat' by 'a major, unequal, and growing threat',	Thank you, this is reflected in key messages later and also in Section B of the second order draft of the SPM
Taki, Hisatomo	Summary for policymakers	1	1	3	3	Parhaps "of life" might be "of human life" or something similar if "life" does not include nature. This comment may be applicable elsewhere in the document.	Thank you, the IPBES definition of good quality of life applies to humans. The term has been added to the glossary
EL Houdi, Khadija	Summary for policymakers	1	1	4	4	"Species are being introduced by humans to all regions of the world at unprecedented rates" It Would be necessary to precise if it's deliberately or accidentally or both	Thank you, we have added "intentionally or unintentionally" to the second order draft of the SPM
Evans, Thomas	Summary for policymakers	1	1	4	4	It seems odd to me to start with the word 'species'. I think it should be 'alien species'. The sentence is still correct with this change.	Thank you, but any species can be introduced (see figure SPM.1)
Government of France	Summary for policymakers	1	1	4	4	Add a time reference related to "unprecedented rates".	Thank you, this part of the sentence has been deleted from the second order draft of the SPM
Government of Germany	Summary for policymakers	1	1	4	4	Need for clarification: Please specify those "unprecedented" rates. What are the current rates at which species are introduced to all regions of the world? Furthermore, please explain what these rates refer to.	Thank you, this part of the sentence has been deleted from the second order draft of the SPM
Government of Germany	Summary for policymakers	1	1	4	4	Proposal: It is suggested to add "intentionally and unintentionally" after introduced, so it would then read: "Species are being introduced intentionally and unintentionally by humans to all regions of the world at unprecedented rates"	Thank you for this suggested change, we have adopted it in the second order draft of the SPM
Government of Mexico	Summary for policymakers	1	1	4	4	It would be useful for policy makers to have an introductory paragraph explaining what IAS are and why they represent a threat to biodiversity and human wellbeing by taking the definition presented in Chaper 1 (1.3 Invasive alien species: what are they and why they matter): invasive alien species are defined within the information on scoping for a thematic assessment of invasive alien species and their control as animals, plants or other organisms introduced directly or indirectly by people into places out of their natural range of distribution, where they have become established and dispersed, and generating an impact on local ecosystems and species (IPBES, 2018a; Figure 1.1). Or, based on this definition, this line could be replaced by: "Species are being introduced directly or indirectly by humans to all regions of the world out of their natural range or distribution at unprecedented rates, becoming established and dispersed, and generating an impact on local ecosystems and species."	Thank you, an introductory paragraph with the definition of native, alien, and invasive alien species has been added to second order draft of the SPM for clarity.
Participants of ILK dialogue workshop (Guadalupe Yesenia Hernández Márquez)	Summary for policymakers	1	1	4	15	Section A. Lines 4-15. Propose to change the order of impacts, starting with those related to the biodiversity and ecosystem services (first lines 9-12) following to those to the humans and economy.	Thank you for this suggested change. We have adopted it in the second order draft of the SPM
Setsaas, Trine Hay	Summary for policymakers	1	1	4	6	Most high-level policy-maker will most likely read only the summary's key messages. Can we expect them to know what "alien" and "invasive" means? Could insert: "...the world at unprecedented rates, called alien species."	Thank you, an introductory paragraph with the definition of native, alien, and invasive alien species has been added to second ordered raft for clarify.

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
EL Houdi, Khadija	Summary for policymakers	1	1	5	6	"with detrimental impacts to nature and people"The impact on human health should be highlighted at the very beginning to draw the attention of policy makers	Thank you for your comment. Authors have chosen to present impacts on nature first, following other reviewers' suggestions
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	1	1	5	5	"Considered" is a vague term. It would be preferable to state approximately 10% of alien species "are," "are estimated to be" or "are recognized as" invasive, depending on what is meant here.	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM
Government of France	Summary for policymakers	1	1	5	5	Reformulate the sentence in order to be more precise: "Approximately 10% of naturalized alien species, which represent about 0,1% of introduced species, are considered as invasive with detrimental impacts to nature and people".	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM.
Government of Germany	Summary for policymakers	1	1	5	5	Proposal: To clarify the first key statement "...% of alien species are considered invasive...", it is proposed to briefly explain the difference between "alien species" and "invasive alien species" by indicating that alien species may generally not pose a critical risk. Alien species may even be beneficial. However, alien species may have the potential to cause significant harm to nature, NCPs, the economy, and a good quality of life. This IPBES report focuses on the latter group of alien species, referred to as "invasive alien species," which are capable of causing significant harm. For providing this information upfront, you may wish to include it in an introductory note /a preamble that explains the scope and the intent of this IPBES report (see general comment above).	Thank you, an introductory paragraph with the definition of native, alien, and invasive alien species has been added to clarify in the second order draft of the SPM. Impacts to nature, NCP and GQL is explained in the key messages
Government of Netherlands (Groenewoud, H. E.)	Summary for policymakers	1	1	5	5	"Approximately 10% of alien species are considered as invasive": Not 'considered' but 'estimated'. This is a widely used rule of thumb, but the scientific base is feeble (or perhaps even non-existent).	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM
Government of USA	Summary for policymakers	1	1	5	5	This should be emphasized... Not all non-indigenous species are considered harmful and invasive. Ex. Pacific salmon in the Great Lakes.	Thank you, we have edited the text accordingly in the second order draft of the SPM
Henk, Groenewoud	Summary for policymakers	1	1	5	5	"Approximately 10% of alien species are considered as invasive": Not 'considered' but 'estimated'. This is a widely used rule of thumb, but the scientific base is feeble (or perhaps even non-existent).	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM
Lieurance, Deah	Summary for policymakers	1	1	5	6	Where did this 10% estimate come from? below you mention records of non-native and invasive (alien) species. Curious if this was calculated or inferred based on the tens rule. If it was calculated, I think it would strengthen the statement to leave off the "Approximately", if not I have heard pushback on the tens rule and wonder if there's a better way to make this point.	Thank you, please refer to Chapter 2 for more information. This sentence has been deleted in this introductory paragraph
Albert, Arnaud	Summary for policymakers	1	1	6	7	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, this figure has been deleted in the introductory paragraph.
Brooks, Thomas	Summary for policymakers	1	1	6	6	State the time period over which this cost is measured? Or is it "total to date"?	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM.
EL Houdi, Khadija	Summary for policymakers	1	1	6	7	"to cost in excess of US\$ 1,738 billion" what does this include? Economic loss or human health expenditures or both?	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM
Government of Canada (Frleigh, Brad)	Summary for policymakers	1	1	6	6	"estimated to cost in excess of US\$ 1,738 billion globally" - please add "over the past 50 years" as in Section 4.4, Box 4.12.	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM
Government of Finland (Niemivuo-Lahti, Johanna)	Summary for policymakers	1	1	6	7	Invasive alien species are estimated to cost in excess of US\$ 1,738 billion globally OR 1.7 trillion on page 12? (Billion is mentioned also in other places.)	Thank you, we have harmonized this figure across the document in the second order draft of the SPM
Government of France	Summary for policymakers	1	1	6	7	Do not confuse estimation of real loss in biodiversity and amenity services and costs due to attempts of their regulation.	Thank you, this figure has been deleted in the introductory paragraph in the second order draft of the SPM
Government of France	Summary for policymakers	1	1	6	6	Is the cost of IAS an annual figure? In that case, "per year" or "annual" should be inserted.	Thank you, this figure has been deleted from the introductory paragraph in the second order draft of the SPM
Government of France	Summary for policymakers	1	1	6	7	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM.
Government of Germany	Summary for policymakers	1	1	6	7	Clarification needed: "Invasive alien species are estimated to cost in excess of US\$ 1,738 billion". We appreciate very much the attempt of the authors to give a precise estimate of the tremendous cost caused by IAS. It might even be helpful for policy-makers if this cost estimate could be also expressed in terms of its share of the annual GDP worldwide. However, it is not clear what these costs exactly comprise and to what period they refer (annual global cost?). So far, the exact impacts of IAS haven't been explained and therefore it is unclear what such costs would be. Furthermore, we would anticipate that such cost estimates are rather rough estimations - therefore having a span of costs might be even more convincing. Furthermore, at page 1 (L6 and L25) the mentioned estimated costs are 1,738 BILLION US dollars, in Figure SPM.2, the costs mentioned are 1.7 TRILLION US dollars. It remains unclear if these costs are different estimations or if the words trillion and billion have not been used adequately. It would be useful to clearly mention/report one number consistently or make sure everyone understands the origin of the different numbers right away.	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM
Government of Germany	Summary for policymakers	1	1	6	6	Proposal: There is no reference to the fact that there are no or hardly any known positive effects due to invasive species. It cannot be assumed per se that invasive species have only negative effects. This spread can be seen as extremely harmful, having some benefits, or it can have no visible effect on the invaded ecosystem. Please consider to add a sentence like: "In general, possible positive effects due to invasive species compared to their negative effects are negligible."	Thank you, this point has been added to the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	1	1	6	6	Line 6 gives a figure of US\$ 1,738 billion but in 'Figure SPM.2: Extent of the problem' this is expressed in trillion. Appreciating that these two figures are the same, it could be clearer if only billion was used. See also in line 25, 249 and 300.	Thank you, this has been clarified in the second order draft of the SPM
Government of Netherlands (Kreiken, Bob)	Summary for policymakers	1	1	6	7	Does this line refer to the cost of their damage or to control measures?	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Netherlands (Kreiken, Bob)	Summary for policymakers	1	1	6	25	The same figure is used twice. Perhaps specify subcategories of this figure.	Thank you, we have deleted the overlaps in the second order draft of the SPM
Government of UK (Mortimer, Diana)	Summary for policymakers	1	1	6	6	the cost of \$1,738 is used several times in the SPM - is that an annual cost or a cost that has occurred? Every time it is used I wonder what time scale it is referring to.	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM.
Government of USA	Summary for policymakers	1	1	6	6	A timeframe should be added to this cost estimate - \$1,738 annually? Since 1970?	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM
Jactel, Hervé	Summary for policymakers	1	1	6	7	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would it make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM.
Karayannis, Theofanis	Summary for policymakers	1	1	6	7	The cost of IAS mentioned here is not defined in any temporal way (e.g. is that figure annual?), which may make it meaningless. This should therefore be specified. The same applies also for Lines 24-25, 248-249 and 299-300, and Figure SPM.2.	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM.
Lieurance, Deah	Summary for policymakers	1	1	6	7	(and line 24-25) The \$1738 bil amount is repeated, is this repetition necessary when writing to be concise or are the authors hammering home how big this number is. Consider removing from one of the sections (A or A1)	Thank you repetitions have been removed from the second order draft of the SPM
Linnamägi, Merike	Summary for policymakers	1	1	6	6	Text states "IAS are estimated to cost", should be the effects of IAS or the impact of IAS. Current text reads more as we talk about the cost of species and specimens themselves.	Thank you, this has been clarified in the second order draft of the SPM
Maillard, Jean-François	Summary for policymakers	1	1	6	7	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would it make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM.
Poulet, Nicolas	Summary for policymakers	1	1	6	7	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would it make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM.
Romero, José A.	Summary for policymakers	1	1	6	6	It would be useful to specify what type of cost we are talking about (cumulative over the last 50 years? annual?) and to write the currency in the USD format: "... USD 1.738 billion globally ..."	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM.
Setsaas, Trine Hay	Summary for policymakers	1	1	6	6	"US\$ 1,738 billion" in total since when? (per year?) Not easy to know for the reader.	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM
Tassin, Jacques	Summary for policymakers	1	1	6	6	please rephrase: 'to cost in excess of, including the costs of contrôle, etc.'	Thank you, this figure has been deleted in the introductory paragraph of the second order draft of the SPM.
Evans, Thomas	Summary for policymakers	1	1	7	7	Everything that humans do is not technically correct (although I appreciate this summary is being written in a language that's easy to digest). Maybe just 'by human activities'?	Thank you, this sentence has been deleted from the second order draft of the SPM
Government of Australia	Summary for policymakers	1	1	7	7	suggest word change "impacts are compounded by other human activities"	Thank you, this sentence has been deleted from the second order draft of the SPM
Government of Australia	Summary for policymakers	1	1	7	7	Suggest replace "everything humans do" with "many activities humans do"	Thank you, this sentence has been deleted from the second order draft of the SPM
Government of Australia	Summary for policymakers	1	1	7	7	Replace "...exacerbated by everything that humans do..."...exacerbated by humans...' [It's not true that everything that humans do exacerbate invasive species]	Thank you, this sentence has been deleted from the second order draft of the SPM
Government of Canada (Fraleigh, Brad)	Summary for policymakers	1	1	7	7	"their impacts are exacerbated by everything that humans do". Everything? Do measures taken to limit or combat IAS exacerbate them? Playing music? Are there no human activities that are neutral with regard to IAS?	Thank you, this sentence has been deleted from the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	1	1	7	7	this statement cannot be defended. Impacts are certainly not exacerbated by phytosanitary measures, for example	Thank you, this sentence has been deleted in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	1	1	7	9	This is a little confusing. Interactions among drivers of biological change (including climate change and other invasive species) influence the establishment and impact of invasive species.	Thank you very much, this sentence has been reworded and simplified in the second order draft of the SPM
Government of France	Summary for policymakers	1	1	7	7	The sentence "are exacerbated by everything that humans do" is too general. We suggest to rephrase it as follows: "can be exacerbated by human activities"	Thank you, this sentence has been deleted from the second order draft of the SPM
Government of France	Summary for policymakers	1	1	7	7	This sentence is a little too vague and it would be necessary to reword it to be more explicit	Thank you, this sentence has been deleted.
Government of Germany	Summary for policymakers	1	1	7	9	Proposal: It is suggested to change the text as follows: "Biological invasions are just one of many interacting drivers of environmental change, including climate change, that can..."	Thank you very much, this sentence has been reworded and simplified in the second order draft of the SPM
Government of Germany	Summary for policymakers	1	1	7	7	Proposal: We strongly suggest to adjust the wording of this generalizing phrase as follows (in bold): "[...] their impacts are exacerbated by everything that humans do other anthropogenic impairments to the environment." Firstly, if "everything" is taken literally the statement certainly doesn't hold true. Secondly, "humans" as a broad category conceal differences in causation, responsibility and parties affected and thereby starting points for an evidence-based problem-solving approach. Please also specify main drivers of growing impacts of IAS more accurately.	Thank you, this sentence has been deleted from the second order draft of the SPM.
Government of Mexico (Koleff, Patricia)	Summary for policymakers	1	1	7	7	Instead of "...impacts are exacerbated by everything humans do" (because this could include control/eradication or restoration actions), it should consider that impacts are exacerbated by other anthropogenic global change threats.	Thank you, this sentence has been deleted.
Government of Netherlands (Groenewoud, H. E.)	Summary for policymakers	1	1	7	7	"their impacts are exacerbated by everything that humans do": Not really 'everything'. Need to rephrase.	Thank you, this sentence has been deleted from the second order draft of the SPM
Government of USA	Summary for policymakers	1	1	7	7	Using the term "everything" here seems like too strong of a statement. Surely some human activities can mitigate impacts of invasive species.	Thank you, this sentence has been deleted from the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Henk, Groenewoud	Summary for policymakers	1	1	7	7	"their impacts are exacerbated by everything that humans do": Not really 'everything'. Rephrase.	Thank you, this sentence has been deleted from the second order draft of the SPM
Jactel, Hervé	Summary for policymakers	1	1	7	7	This sentence is a little too vague and it would be necessary to reword it to be more explicit	Thank you, this sentence has been deleted.
Lang, Iris	Summary for policymakers	1	1	7	9	Biological invasions are not acting alone; interactions amongst other drivers of environmental change, including climate change, can exacerbate the rate of introduction, the spread and the impact of invasive alien species .	Thank you very much, this sentence has been reworded and simplified in the second order draft of the SPM
Nunes, Ana	Summary for policymakers	1	1	7	7	Suggest to rephrase to 'and their impacts are constantly exacerbated by human activities.'	Thank you, this sentence has been deleted from the second order draft of the SPM
Razafiarison, Fanirisoa	Summary for policymakers	1	1	7	9	Especially global warming (a factor interacting with biological invasion) in hot tropical regions. It should be remembered that: climate is one of the barriers that allows or not the filtering of invasive species just after their introduction.	Thank you very much, this sentence has been reworded and simplified in the second order draft of the SPM
Setsaas, Trine Hay	Summary for policymakers	1	1	7	7	The phrase "everything that humans do" should perhaps be phrased clearer.	Thank you, this sentence has been deleted from the second order draft of the SPM
Takahashi, Yasuo	Summary for policymakers	1	1	7	7	Suggest deleting "and their impacts are exacerbated by everything that humans do". This phrase sounds a bit rough and does not add much to the sentence. Anyway the driver of IAS spread is detailed in Section B.	Thank you, this sentence has been deleted from the second order draft of the SPM
Eckbo, Norith	Summary for policymakers	1	1	8	9	The term "biological invasions" is unprecise in this context and may give the impression that it is happening as a natural thing, and not human-induced. Consider replacing "biological invasions" with "invasions of alien species" to be more precise.	Thank you, in the second order draft of the SPM, we have added the definition of biological invasions in the introduction to clarify.
EL Houdi, Khadija	Summary for policymakers	1	1	8	9	"other drivers of environmental change, including climate change", could the climate change be a real and first cause of invasive species eruption instead of only a driver , combined with human action?It should be precised	Thank you for your comment. Climate change can be the first driver, but not in all cases. More explanations come later.
Government of France	Summary for policymakers	1	1	8	8	Instead of "interactions amongst", we suggest to write "interactions with". Ideed, "interactions amongst" would mean that interactions between pressures others than biological invasions do exacerbate biological invasions, while we believe that what is meant is that biological invasions can be exacerbated by interacting with other types of pressure, which corresponds to what is developed in the "Background section".	Thank you, this has been edited accordingly in the second order draft of the SPM
Government of Belgium	Summary for policymakers	1	1	9	9	... including climate change AND POLLUTION	Thank you very much, this sentence has been reworded and simplified in the second order draft of the SPM
Government of Chile (Ministry of the Environment)	Summary for policymakers	1	1	9	9	We suggest completing this line with: "Introduction, establishment and spread"	Thank you very much, this sentence has been reworded and simplified in the second order draft of the SPM
Government of France	Summary for policymakers	1	1	9	9	The other drivers of biodiversity loss should be added, i.e. habitat degradation, overexploitation, and pollution	Thank you very much, this sentence has been reworded and simplified in the second order draft of the SPM
Government of USA	Summary for policymakers	1	1	9	9	change "exacerbate" to "affect" as noted in A5 below there are factors that can make the occurrence and outcomes of biological invasions difficult to predict	Thank you, this sentence has been deleted from the second order draft of the SPM
Jactel, Hervé	Summary for policymakers	1	1	9	9	The other drivers of biodiversity loss should be added, i.e. habitat degradation, overexploitation, and pollution	Thank you very much, this sentence has been reworded and simplified in the second order draft of the SPM
Nunes, Ana	Summary for policymakers	1	1	9	9	Suggest to add 'the rate of introduction and spread, as well as impacts, of invasive alien species.'	Thank you very much, this sentence has been reworded and simplified in the second order draft of the SPM
Takahashi, Yasuo	Summary for policymakers	1	1	9	9	suggest addition: "... can exacerbate the rate of introduction and spread of invasive alien species and their impacts "	Thank you, this sentence has been deleted from the second order draft
Eckbo, Norith	Summary for policymakers	1	1	10	12	Consider adding 'the economy' after 'nature's contribution to people'.	Thank you, the economy is included in "good quality of life"
Government of Canada (Fraleigh, Brad)	Summary for policymakers	1	1	10	11	Include "nature", "nature's contributions to people" and "good quality of life" in the Glossary. These are key recurring terms in the assessment.	Thank you, these terms are now added to the glossary of the second order draft of the SPM
Evans, Thomas	Summary for policymakers	1	1	12	12	When is a community not local? Perhaps this is defined in the glossary?	Thank you, this term is an IPBES accepted one, defined in the IPBES core glossary
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	1	1	12	12	We are all entirely dependent on nature - suggest "those most directly dependent on nature" here. Also on line 23	Thank you, this sentence has been deleted from the second order draft
Government of USA	Summary for policymakers	1	1	12	13	There are cases where invasive species have provided new foods sources for local people. I do not think it is accurate to imply that the only impacts of invasive species are purely negative. Yes, that is very much usually the case, but not always. This point is discussed later in the document and should be emphasized here at the beginning.	Thank you, this has been emphasized at the start of section A
Kamal Kumar Rai	Summary for policymakers	1	1	12	13	Because for indigenous peoples Nature is alive and sacred, the guardian or the first nation should be the main priority when regarding impacts. The values and systems of IPLCs and their dynamic relationship with Mother Nature are being adversely affected from the IAS. Traditional occupations of IPLCs, ecosystems and ecology of the native species and their habitats are disrupted, and often native species (e.g. traditional crops like rice, buckwheat, barley), bear cultural, spiritual, religious, ritual, medicinal and livelihood importance for IPLCs societies. IAS therefore affect the traditional way of life of IPLCs, loss of traditional or cultural identities and the systems that transfer ILK to younger generations can collapse. The holistic systems, values and the historical relationship of IPLCs, women and elders must be assessed in respect to FPIC, Full and effective participation and ensuring the rights of Self-determination of IPs in science and policy.	Thank you, we have a dedicated paragraph on impacts on IPLCs in Section A.
Government of Canada (Alexander, Steven)	Summary for policymakers	1	1	13	15	The text reads as though it is being transported intentionally - however in key message B2 are more nuanced with regards to both the intentional and unintentional distribution related to global trade and transport. A bit more nuance here would be beneficial for the reader.	This sentence has been deleted from the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	1	1	13	15	suggest that this be combined with the sentence on line 4: "The rate of species introductions continues to increase in all regions, largely due to increased transportation."	This sentence has been deleted from the second order draft of the SPM
Government of Germany	Summary for policymakers	1	1	13	14	Clarification needed: Is it only the 'escalation in numbers of IAS' (numerical increase) <i>and/or</i> does the spatial spreading of certain IAS (quality) contribute to worldwide "unprecedented rate of deterioration" as well?	Thank you. This sentence has been deleted from the second order draft of the SPM.

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Germany	Summary for policymakers	1	1	13	13	Proposal: It is suggested to change the text as follows: "The increasing numbers of invasive alien species...". Alternatively, the authors might specify the "escalation in number" more precisely (when did it start, what are annual growth rates etc).	This sentence has been deleted from the second order draft of the SPM
Government of Mexico (Koleff, Patricia)	Summary for policymakers	1	1	13	15	The escalation is not only in the number of IAS, but in the rate of introduction and spread of high-impact IAS and their establishment in increasingly degraded areas.	This sentence has been deleted from the second order draft of the SPM
Government of Netherlands (Groenewoud, H. E.)	Summary for policymakers	1	1	13	14	"The escalation in numbers of invasive alien species being transported around the world" Delete 'invasive alien', for this is a matter of perspective. During their transportation over the world species are just 'species'. One could just as well call them 'native species', for they are native in their country of origin. On a global scale (which is the scale in this sentence) a mallard is not an 'invasive species', it is only considered invasive in certain parts of the world.	This sentence has been deleted from the second order draft of the SPM
Henk, Groenewoud	Summary for policymakers	1	1	13	14	"The escalation in numbers of invasive alien species being transported around the world" Delete 'invasive alien', for this is a matter of perspective. During their transportation over the world species are just 'species'. One could just as well call them 'native species', for they are native in their country of origin. On a global scale (which is the scale in this sentence) a mallard is not an 'invasive species', it is only considered invasive in certain parts of the world	This sentence has been deleted from the second order draft of the SPM
Government of New Zealand (Perry, Joanne)	Summary for Policymakers	1	1	14	15	after transported - insert the terms <i>intentionally and unintentionally</i> to make it clearer that both pathways of transportation lead to the spread of invasives.	Thank you. This sentence has been deleted from the second order draft of the SPM.
Nunes, Ana	Summary for policymakers	1	1	14	14	Suggest to add 'being transported and introduced around the world'	This sentence has been deleted from the second order draft of the SPM.
Tassin, Jacques	Summary for policymakers	1	1	14	14	please modify as following: "is contributing to and enforced by' (please do not forget the symetry of the process)	This sentence has been deleted from the second order draft of the SPM
Bharat, Alka	Summary for policymakers	1	1	15	15	add line; dynamic problem existing at all scale at terrestrial and marine fabrics	This sentence has been deleted from the second order draft of the SPM
Government of Belgium	Summary for policymakers	1	1	15	15	A very minor detail: the use of "our" (biosphere) instead of "the" (biosphere) stands out as it's the only time a possessive adjective is used in the summary for PM. Is it on purpose, and why?	Thank you. This sentence has been deleted from the second order draft of the SPM
Government of USA	Summary for policymakers	1	1	15	15	This should be emphasized... Not all non-indigenous species are considered harmful and invasive. Ex. Pacific salmon in the Great Lakes. There are cases where invasive species have provided new foods sources for local people. It is not accurate to imply that the impacts of invasive species are purely negative. Yes, that is very much usually the case but not always. This point is discussed later in the document (e.g., lines 40-41) and should be emphasized here at the beginning.	Thank you, we have emphasized this point, and removed the mention of indigenous peoples and local communities here
Government of Germany	Summary for policymakers	1	1	16	30	Proposal: It is suggested to change the order of key messages A2 and A1 for better readability.	Thank you for this suggested change, we have adopted it in the second order draft of the SPM
Diaz, Sandra	Summary for policymakers	1	1	17	17	consider replacing "detrimental to nature" to "detrimental to native nature"	Thank you, we have decided not to address this comment, as IAS are considered as drivers in this assessment - adding "native" may raise suspicions and complicate the SPM
Government of Argentina	Summary for policymakers	1	1	17	25	This paragraph lacks necessary qualifiers. For example, it says "Biological invasions are caused by humans". The correct formulation would be "Biological invasions CAN BE caused by humans". Additionally, it says "Invasive alien species cause the extinction". It should say "Invasive alien species MAY cause the extinction": Finally, it says "They pose threats to food security, human health (including disease transmission leading to pandemics)". We suggest to delete the parenthesis, given that this may be ONE of the possible threats and its inclusion with such relevance causes imbalance regarding other threats.	Thank you, the definition of biological invasions at the start of the document clarifies that, by definition, biological invasions are caused by humans.
Government of Estonia (Otsus, Merit)	Summary for policymakers	1	1	17	25	This para partly repeats what is said on page1 lines 4-15. If it is intentional and aims in making the message stronger and clearer, it's ok. Otherwise, for the sake of keeping the SPM as short as possible and as long as necessary, para A1 could come out with new information or provide in depth information to that given in A. The repetitions seem to be superfluous.	Thank you the repetitions have been removed from the second order draft of the SPM
Government of Germany	Summary for policymakers	1	1	17	25	Proposal: This paragraph repeats a substantial part of the text in the previous paragraph and could be considerably reduced.	Thank you the repetitions have been removed from the second order draft of the SPM
Tassin, Jacques	Summary for policymakers	1	1	17	17	globally but inequally	Thank you, this point is further developed in the next point A3
Albert, Arnaud	Summary for policymakers	1	1	18	18	The current meaning of the term "biological invasions" refers only to invasive alien species and not also to invasive native species, in which case biological invasions are associated with humans.	Thank you, the definition of biological invasions at the start of the document clarifies that, by definition, biological invasions are caused by humans.
Diaz, Sandra	Summary for policymakers	1	1	18	18	The vast majority, but not absolutely all biological invasions are human caused over history, so I wuld qualify by saying "MOST biological extinctions are caused by humans..."	Thank you, the definition of biological invasions at the start of the document clarifies that, by definition, biological invasions are caused by humans.
EL Houdi, Khadija	Summary for policymakers	1	1	18	18	"Biological invasions are caused by humans" here also there is aneed to precise if its accidentally or voluntarily?	Thank you, this has been clarified in the introductory section of the second order draft of the SPM
Government of Canada (Chakravarty, Bipasha)	Summary for policymakers	1	1	18	19	Not all invasive alien sps are introduced by human interventions. Sometimes they may be introduced by natural migration, water bodies or weather too.	Thank you, the definition of biological invasions at the start of the document clarifies that, by definition, biological invasions are caused by humans.
Government of Canada (Fraleigh, Brad)	Summary for policymakers	1	1	18	18	To state that "Biological invasions are caused by humans" is trivial, given that the Glossary defines invasions as being of human origin. The sentence however sounds exaggerated and detracts from the credibility of the assessment. The Glossary defines biological invasions as "intentionally or accidentally introduced outside of their natural range by humans" (our emphasis). Should qualify such as "as defined in the Glossary", or "as opposed to natural colonization". This is more accurately conveyed in Figure APM.1 (page 10)	Thank you, the definition of biological invasions at the start of the document clarifies that, by definition, biological invasions are caused by humans.
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	1	1	18	20	suggest deletion of at least the second part, as both inaccurate and not relevant to the bold statement.	Thank you, in the second order draft of the SPM, the statement has been rephrased to clarify.
Government of France	Summary for policymakers	1	1	18	18	Perhaps indicate intentionally and most often unintentionally.	Thank you, the data doesn't allow us to make this statement, but we have added a few sentences for clarification in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of France	Summary for policymakers	1	1	18	19	Reformulate the sentence in order to introduce a few qualifications regarding the human-induced biological invasions: "Biological invasions are caused in large part [...]" OR "Biological invasions are, among other grounds, caused by humans [...]. Indeed, non-human-induced invasions do also exist, and are for instance caused by spontaneous migration.	Thank you, the definition of biological invasions at the start of the document clarifies that, by definition, biological invasions are caused by humans.
Government of France	Summary for policymakers	1	1	18	20	The end of the sentence "by almost everything humans in modern societies do" is vague and does not seem scientific. This part of the sentence sounds a bit strange, and not very specific. We suggest to rephrase it as follows : "by most human activities" or "by many human activities in modern societies".	Thank you, we have rephrased this in the second order draft of the SPM
Government of Germany	Summary for policymakers	1	1	18	20	Clarification needed: Again, the phrase "Biological invasions (...)" and their impacts are exacerbated by almost everything humans in modern societies do" sounds more like an ideologically motivated statement. Kindly consider rewording this statement according to the lines, "introductions and their impacts are exacerbated by numerous human activities characteristic of modern societies, such as ...".	Thank you, the definition of biological invasions at the start of the document indeed clarifies that, by definition, biological invasions are caused by humans.
Government of Mexico	Summary for policymakers	1	1	18	20	Suggestion to replace the phrase "Biological invasions are caused by humans, and both introductions and their impacts are exacerbated by almost everything humans in modern societies do." for "Biological invasions are caused by humans, and both introductions and their impacts are exacerbated by most human activities of modern societies."	Thank you, this sentence has been removed from the second order draft of the SPM, but an introductory paragraphs clarifies this point
Government of Netherlands (Groenewoud, H. E.)	Summary for policymakers	1	1	18	18	"Biological invasions are caused by humans": By definition, to distinguish them from natural biological invasions like plagues. Stated like this it feels rather tendentious.	Thank you, the definition of biological invasions at the start of the document indeed clarifies that, by definition, biological invasions are caused by humans.
Government of UK (Mortimer, Diana)	Summary for policymakers	1	1	18	18	The sentence 'biological invasions are caused by humans' this implies all - is that true - does it refer to the definition of 'biological invasion'?	Thank you, the definition of biological invasions at the start of the document clarifies that, by definition, biological invasions are caused by humans.
Government of USA	Summary for policymakers	1	1	18	19	Not necessarily always the case. In another chapter of this document, authors talk about organisms being transported by natural phenomenon (storms, high wind events, etc). It also seems to be a sweeping claim that invasions are exacerbated by almost everything that humans do.	Thank you, the definition of biological invasions at the start of the document clarifies that, by definition, biological invasions are caused by humans.
Henk, Groenewoud	Summary for policymakers	1	1	18	18	"Biological invasions are caused by humans": By definition, to distinguish them from natural biological invasions like plagues. Stated like this it feels rather tendentious.	Thank you, the definition of biological invasions at the start of the document indeed clarifies that, by definition, biological invasions are caused by humans.
Jactel, Hervé	Summary for policymakers	1	1	18	18	Perhaps indicate intentionally and most often unintentionally.	Thank you, the data doesn't allow us to make this statement, but we have added a few sentences for clarification in the second order draft of the SPM
Nunes, Ana	Summary for policymakers	1	1	18	19	Suggest to rephrase to 'Biological invasions are the result of humans moving species around the globe, and both species introductions and their impacts are exacerbated by human activities.'	Thank you, the latter part of the statement has been rephrased accordingly in the second order draft of the SPM. The first part of the statement has been clarified in the introduction
Teyssèdre, Anne	Summary for policymakers	1	1	18	18	« Biological invasions are caused by humans » : No : Biological invasions have occurred long before human evolution (since the beginning of life on Earth) (e.g. Vermeij, G. L. 1991. When biota meet: understanding biotic changes. – Science 253: 1099–1104.) => « All known recent or current biological invasions are driven by human activities ».	Thank you, the definition of biological invasions at the start of the document clarifies that, by definition, biological invasions are caused by humans.
Teyssèdre, Anne	Summary for policymakers	1	1	18	18	« Biological invasions are caused by humans » : No : Biological invasions have occurred long before human evolution (since the beginning of life on Earth) (e.g. Vermeij, G. L. 1991. When biota meet: understanding biotic changes. – Science 253: 1099–1104.) Suggested reformulation : « All known recent or current biological invasions are driven by human activities ».	Thank you, the definition of biological invasions at the start of the document clarifies that, by definition, biological invasions are caused by humans.
Government of Australia	Summary for policymakers	1	1	19	20	suggest word change "impacts are compounded by other human activities"	Thank you, we have rephrased this in the second order draft of the SPM
Government of Australia	Summary for policymakers	1	1	19	19	Replace "almost everything" with "much that"	Thank you, we have rephrased this in the second order draft of the SPM
Government of France	Summary for policymakers	1	1	19	19	« exacerbated by almost everything humans in modern societies do » : Suggested reformulation : « exacerbated by the many other impacts-known as global changes- of modern societies on land and water ecosystems. »	Thank you, we have rephrased this in the second order draft of the SPM
Government of France	Summary for policymakers	1	1	19	20	Needs to be more specific, provide examples	Thank you, we have made this point more specific but examples and more details are provided in the background section (including figures) in the second order draft of the SPM
Government of Germany	Summary for policymakers	1	1	19	19	Clarification needed: It is suggested to provide a definition for "modern societies" and reexamine if the usage of the term is applicable for an assessment with a global reach. Clarification is needed whether the term refers to all societies in the historical period of (late) modernity or societies with specific characteristics and institutional arrangements.	Thank you, we have rephrased this in the second order draft of the SPM and deleted the reference to modern societies.
Government of Mexico (Koleff, Patricia)	Summary for policymakers	1	1	19	20	Put that way, it leaves a message that there is nothing to be done, for whatever we do will be exacerbated. I understand the point, but it should be emphasised that without controls, biosafety measures and the involvement of society as a whole, anthropogenic activities will continue to exacerbate the impacts of IAS.	Thank you, the scope of section A is on the problem, but we have added a few positive words at the end of this section in the second order draft of the SPM to address your concerns
Government of Netherlands (Groenewoud, H. E.)	Summary for policymakers	1	1	19	19	"almost everything" The wording is better than line 7, but still too tendentious.	Thank you, we have rephrased this in the second order draft of the SPM
Henk, Groenewoud	Summary for policymakers	1	1	19	19	"almost everything" The wording is better than line 7, but still too tendentious.	Thank you, we have rephrased this in the second order draft of the SPM
Jactel, Hervé	Summary for policymakers	1	1	19	20	Needs to be more specific, provide examples	Thank you, we have made this point more specific but examples and more details are provided in the background section (including figures) of the second order draft of the SPM.
Setsaas, Trine Hay	Summary for policymakers	1	1	19	20	The phrase "almost everything humans in modern societies do." should perhaps be more concrete/ explicit. See comment above.	Thank you, we have rephrased this in the second order draft of the SPM
Teyssèdre, Anne	Summary for policymakers	1	1	19	19	« exacerbated by almost everything humans in modern societies do » : No. => « exacerbated by the many other impacts-known as global changes- of modern societies on land and water ecosystems. »	Thank you, we have rephrased this in the second order draft of the SPM
Teyssèdre, Anne	Summary for policymakers	1	1	19	19	« exacerbated by almost everything humans in modern societies do » : Suggested reformulation : « exacerbated by the many other impacts-known as global changes- of modern societies on land and water ecosystems. »	Thank you, we have rephrased this in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Bharat, Alka	Summary for policymakers	1	1	20	20	Add after 'do'_ Climate variability is adding to the complexity	Thank you, we have deleted this sentence and the comment is therefore no longer relevant
Government of Finland (Niemiuvuo-Lahti, Johanna)	Summary for policymakers	1	1	20	21	AND chapters A-D: Sentence: "Invasive alien species cause the extinction and endangerment of native species and ecosystems." Only this one sentence is not enough to describe the problem of IAS to the nature and other natural species; this aspect is too weak compared to the several aspects describing the harm to humans, which can be found in several places. -> We would like to have more clarifying text, as the rational behind, why IAS are one of the main drivers to threaten biodiversity, this aspect is not clearly explained here or in the Key messages on pages 1-8: for the policy makers this essential aspect is missing and should be further clarified and explained by using some examples.	Thank you, we have added more details on the mechanisms in the second order draft of the SPM
Government of France	Summary for policymakers	1	1	20	21	Such a link between IAS and extinction/endangerment does not concern all IAS and all native species and ecosystems. Replace "cause" by "may induce".	Thanks for this suggested change. We have included it in the second order draft of the SPM
Government of France	Summary for policymakers	1	1	20	21	The fact that IAS are the main driver of species extinction, as they are involved in 44% recorded extinctions (fig SPM.2), is a strong message and could be highlighted here.	Thank you, we have removed the 44% from the extinctions box as it apparently led to misinterpretation and confusion in the second order draft of the SPM
Government of France	Summary for policymakers	1	1	20	24	The SPM does not explain the reasons and mechanisms behind this species extinction and threat to food security, health, etc. It would be necessary to explain the ecological processes behind these observations: competition, predation, etc., because for a decision-maker who is not an expert on the subject, this may appear to be information taken out of context and out of its deep explanation.	Thank you, we have added mechanisms to the second order draft in response to this comment
Government of Netherlands (Groenewoud, H. E.)	Summary for policymakers	1	1	20	21	"cause the extinction and endangerment of native species and ecosystems": add 'can' before 'cause'	Thanks for this suggested change. We have included it in the second order draft of the SPM
Government of USA	Summary for policymakers	1	1	20	21	Again, not always the case. They CAN result in the extinction and endangerment of native species but they don't always.	Thanks for this suggested change. We have included it in the second order draft of the SPM
Henk, Groenewoud	Summary for policymakers	1	1	20	21	"cause the extinction and endangerment of native species and ecosystems": add 'can' before 'cause'	Thanks for this suggested change. We have included it in the second order draft of the SPM
EL Houdi, Khadija	Summary for policymakers	1	1	21	21	They pose threats to food security, water availability and human health	Thank you water security has been added to the second order draft of the SPM
Government of France	Summary for policymakers	1	1	21	21	Add "biodiversity" because they pose threat also for biodiversity.	Thank you, biodiversity is included in the concept of nature (see IPBES definition)
Government of France	Summary for policymakers	1	1	21	21	Before "They pose", add this precision : "Together with these impacts, [they pose ...]"	Thank you, we have deleted this sentence and the comment is therefore no longer relevant
Government of France	Summary for policymakers	1	1	21	24	Such a link between IAS and extinction/endangerment does not concern all IAS and all native species and ecosystems. Replace "cause" by "may induce".	Thank you, we have deleted this sentence and the comment is therefore no longer relevant
Government of USA	Summary for policymakers	1	1	21	24	Again, not always the case. They CAN result in the extinction and endangerment of native species but they don't always do.	Thanks for this suggested change. We have included it in the second order draft of the SPM
Government of USA	Summary for policymakers	1	1	21	21	Modify to: They pose threats to food security, animal and human health (including disease transmission potentially leading to pandemics),	Thank you. Animal health is a concept included in livelihoods
Government of USA	Summary for policymakers	1	1	21	22	This section confuses several matters. Recommend using the following language instead: "invasive [alien] species that are or may be vectors, reservoirs, and causative agents of disease."	Thank you - we have revised this section and this comment no longer corresponds to the text
Jactel, Hervé	Summary for policymakers	1	1	21	21	Add "biodiversity" because they pose threat also for biodiversity.	Thank you, biodiversity is included in the concept of nature (see IPBES definition)
Kamal Kumar Rai	Summary for policymakers	1	1	21	21	They pose threats to food and water security, animal and human health	Thank you, water security has been added to the second order draft of the SPM. Animal health is not included in good quality of life, but covered in livelihood.
Karayannis, Theofanis	Summary for policymakers	1	1	21	22	The summary of impacts of IAS mentioned here focuses entirely on nature and humans, and omits the impacts on infrastructure and economic activities. This is particularly important in the marine and coastal realms, where IAS have very substantial economic impacts on coastal infrastructure and on activities such as tourism, fishing and aquaculture. Noting item D2 under the key messages (Page 7), highlighting that policymakers should take into account the costs and economic impacts of IAS in a holistic manner, this becomes an important omission as this aspect could significantly contribute to the consideration of the trade-offs mentioned in D2. The same comment applies also for Lines 255-258 and 294-295.	Thank you, economy is included in good quality of life. We have developed this point in a different paragraph. We may not add too many examples and details in the SPM but please refer to the chapters for more information
Teyssèdre, Anne	Summary for policymakers	1	1	21	21	Before "They pose", add this precision : "Together with these impacts, [they pose ...]"	Thank you, we have deleted this sentence and the comment is therefore no longer relevant
Teyssèdre, Anne	Summary for policymakers	1	1	21	21	Before "They pose", add this precision : "Together with these impacts, [they pose ...]"	Thank you, we have deleted this sentence and the comment is therefore no longer relevant
EL Houdi, Khadija	Summary for policymakers	1	1	22	23	with impacts disproportionately spread on countries and continents , affecting people...;	Thank you, we have rephrased this paragraph in the revised version, and the comment is no longer relevant
Evans, Thomas	Summary for policymakers	1	1	22	22	I would split this sentence in two. First line ending with '...many communities'. The second line starting with 'Their impacts disproportionately affect...'	Thank you, we have rephrased this paragraph in the second order draft of the SPM. This long sentence no longer exists.
Government of Australia	Summary for policymakers	1	1	22	22	Replace "social needs" with "social needs and values"	Thank you, we have rephrased this paragraph in the second order draft of the SPM, and the comment is no longer relevant
Government of Germany	Summary for policymakers	1	1	22	22	Proposal: Please remove first "and" in this line.	Thank you, we have rephrased this paragraph in the second order draft of the SPM, and the comment is no longer relevant
Government of Netherlands (Groenewoud, H. E.)	Summary for policymakers	1	1	22	22	"leading to pandemics": add 'potentially' before 'leading' (see line 297)	Thank you, we have removed this part of the paragraph from the second order draft of the SPM.
Government of UK (Mortimer, Diana)	Summary for policymakers	1	1	22	22	later on it says that IAS can potentially cause pandemics - this could be echoed here too as I am not aware of a pandemic being caused by IAS yet.	Thank you, we have tried to remove overlaps as much as possible from the second order draft of the SPM - the SPM states that it can <i>potentially</i> leads to pandemics
Henk, Groenewoud	Summary for policymakers	1	1	22	22	"leading to pandemics": add 'potentially' before 'leading' (see line 297)	Thank you, we have removed this part of the paragraph from the second order draft of the SPM.

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Nunes, Ana	Summary for policymakers	1	1	23	23	Change place of comma 'on nature, including indigenous'	Thank you, this has been addressed in the second order draft of the SPM
Albert, Arnaud	Summary for policymakers	1	1	24	25	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would it make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Evans, Thomas	Summary for policymakers	1	1	24	24	Again the use of 'local communities' here might need thought.	Thank you, this has been checked and corrected in the second order draft of the SPM
Government of Australia	Summary for policymakers	1	1	24	25	Delete "The cumulative global costs of invasive alien species are 24 estimated to exceed US\$ 1,738 billion" as it is also mentioned in the paragraph above	Thank you, we have rephrased this statement in the revised version, and the comment is no longer relevant
Government of Canada (Fraleigh, Brad)	Summary for policymakers	1	1	24	25	"The cumulative global costs of invasive alien species are estimated to exceed US\$ 1,738 billion" - please add "over the past 50 years" as in Section 4.4. Box 4.12.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	1	1	24	25	This duplicates lines 6-7, and should only appear in one place. Given that many economic costs have not been estimated, it could likely be strengthened to "costs of IAS exceed," a higher-confidence statement than "are estimated to exceed." This estimate is over what time frame?	Thank you repetitions have been removed in the second order draft of the SPM
Government of France	Summary for policymakers	1	1	24	24	Befor "The cumulative global costs", add this precision: "Favored or not by other environmental changes, [the cumulative global costs ...]"	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Government of France	Summary for policymakers	1	1	24	25	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would it make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Government of Germany	Summary for policymakers	1	1	24	24	Clarification required: Here (and at later stages of the SPM), it is stated that the "global costs of invasive alien species are estimated to exceed US\$ 1,738 billion". Could you please specify which costs are meant here (e.g. prevention, management, eradication etc.).	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Government of Germany	Summary for policymakers	1	1	24	25	Proposal: Please avoid the repetition of global monetary costs of the economic impact caused by invasive alien species shortly after having mentioned them in L6 on the same page (p.1).	Thank you repetitions have been removed from the second order draft of the SPM
Government of Mexico	Summary for policymakers	1	1	24	25	The cost of IAS is already mentioned in paragraph A (lines 6-7). To avoid duplication, paragraph A could be limited to stress that IAS have a very high economic cost, and A1 could give the detailed cumulative amount.	Thank you repetitions have been removed in the second order draft of the SPM
Government of USA	Summary for policymakers	1	1	24	24	Is this annual cost? What is time period? Total cost? {Connected with questions from line 37?}	Thank you, we have rephrased this statement in the revised version, and the comment is no longer relevant
Jactel, Hervé	Summary for policymakers	1	1	24	25	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would it make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Kamal Kumar Rai	Summary for policymakers	1	1	24	24	Livelihoods and socio-culture and economic depance of IPLCs on ecosystems need to be a priority.	Thank you, we flag this topic in the second order draft of the SPM but IPBES assessments may not be policy prescriptive
Maillard, Jean-François	Summary for policymakers	1	1	24	25	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would it make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Poulet, Nicolas	Summary for policymakers	1	1	24	25	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would it make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Romero, José A.	Summary for policymakers	1	1	24	25	It would be helpful to specify the number of years that led to this estimate: " The cumulative global costs over the last 50 years of invasive alien species are estimated to be more than 1,738 billion USD"	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Teyssèdre, Anne	Summary for policymakers	1	1	24	24	Befor "The cumulative global costs", add this precision: "Favored or not by other environmental changes, [the cumulative global costs ...]"	Thank you, we have rephrased this statement in the second order draft of the SPM and the comment is no longer relevant
Teyssèdre, Anne	Summary for policymakers	1	1	24	24	Befor "The cumulative global costs", add this precision: "Favored or not by other environmental changes, [the cumulative global costs ...]"	Thank you, we have rephrased this statement in the second order draft of the SPM and the comment is no longer relevant
Government of France	Summary for policymakers	1	1	25	25	add "billion per year", if it is an annual figure.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Government of France	Summary for policymakers	1	1	25	25	It is not very clear whether this amont include cost of regulation	Thank you, we have rephrased this statement in the revised version, and the comment is no longer relevant
Grossart, Hans-Peter	Summary for policymakers	1	1	25	25	It is unclear how you derive to the estimated costs "to exceed US\$ 1,738 billion"? As a scientist I would expect some more details, precise time range since cumulative, a reference or a brief description how this is calculated...	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Setsaas, Trine Hay	Summary for policymakers	1	1	25	25	"US\$ 1,738 billion" in total since when? (per year?) Not easy to know for the reader.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Taki, Hisatomo	Summary for policymakers	1	1	25	25	It may be possible to add the fact that these costs are increasing if it is.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
EL Houdi, Khadija	Summary for policymakers	1	1	27	27	Since ? Upwards of 35,000 alien species were recorded globally: could be important that the rhythm is increasing with patterns of inappropriate consumption and production	Thank you, this is throughout human history
Fagot, Cédric	Summary for policymakers	1	1	27	30	Add in paragraph A2 - Economical impact is not enough develop regarding cost of IAS and cost of non or delayed action (could be based on recent UICN communication)	Thank you, we have added more information on the costs, and the methodology can be found in chapter 4 of the second order draft of the SPM. This is based on the latest findings from INVACOST

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Chile (Ministry of the Environment)	Summary for policymakers	1	1	27	30	It would be clearer if the title and its content specify if the number is due to a rise of rate or rise if traceability.	Thank you, the rate is increasing due to human activities (this is now clearly stated in the first sentence of the second order draft of the SPM)
Government of France	Summary for policymakers	1	1	27	30	Add in paragraph A2 - Economical impact is not enough develop regarding cost of IAS and cost of non or delayed action (could be based on recent IUCN communication)	Thank you, we have added more information on the costs, and the methodology can be found in chapter 4 of the second order draft of the SPM. This is based on the latest findings from INVACOST
Government of France	Summary for policymakers	1	1	27	28	Reformulate the term "alien species" or the whole sentence. Replace "alien species" by "naturalized alien species" or "established alien species". OR replace "[...] alien species were recorded in natural habitats/ecosystems [...]".	Thank you. The paragraph has been reworded in the second order draft of the SPM, using the terminology introduced in the preamble section.
Government of France	Summary for policymakers	1	1	27	28	Replace "Upwards of 35,000" by "Nearly 40,000" (see the background).	Thank you, we have harmonized this figure across the document in the second order draft of the SPM
Government of Germany	Summary for policymakers	1	1	27	27	Clarification needed: "Upwards of 35,000 alien species were recorded globally" - It is not clear what is meant by "Upwards of". Furthermore, the number is not really consistent with number presented in L261: "Worldwide 39,191 taxa ". It is suggested to replace the phrase by "Almost/Nearly 40,000 alien species (...)"	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Germany	Summary for policymakers	1	1	27	30	Clarification needed: This paragraph begins with the proportion of invasive species, out of all alien species (10%), but does not expand on it. It would be appropriate to add one or two sentences on this.	Thank you, we have revised the draft accordingly in the second order draft of the SPM
Grossart, Hans-Peter	Summary for policymakers	1	1	27	27	10% is a rough average, please add the range since in some systems invasive alien species can contribute to more than 80%!	Thank you for this suggestion. We have chosen to include it in the section of the second order draft of the SPM
Razafiarison, Fanirisoa	Summary for policymakers	1	1	27	28	In the case of Madagascar, concerning plant species, it is estimated that 1157 plants have been introduced to the country :611 cultivated, 546 naturalized including 101 invasive (Christian et al., 2006). Christian A. K., Tassin J., S. Moreau, H. Rakoto Ramiarantsoa, C. Blanc-Pamard & S.M. Carrière (2006). Biological Invasions. Selected Papers from the 12th International Conference on Aquatic Invasive Species, Windsor, Ontario, Canada, 9-12 June 2003. ISSN & 1387-3547 Volume 8 Number 1 January 2006. 16 pages	Thank you, kindly refer to the management plan from Chapter 2 to see the data used to assess status of invasive alien species
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	1	1	28	28	as noted on line 5: "Considered" is a vague term. It would be preferable to state approximately 10% of alien species "are," "are estimated to be" or "are recognized as" invasive, depending on what is meant here.	Thank you for this suggestion. We have chosen to include it in the section in the second order draft of the SPM
Tassin, Jacques	Summary for policymakers	1	1	28	28	That should be mentioned that these alien species mostly occur at local scales, rarely worldly.	Thank you, we have added the importance of local management but biological invasions are a global phenomenon
Government of Germany	Summary for policymakers	1	1	29	29	Clarification needed: Please check how all biomes can be affected with certainty against the statement on page 13, L364-366 that "... comprehensive assessments of the status and trends of invasive alien species in terrestrial, freshwater and marine protected areas are lacking (well established.)"	Thank you, confidence levels have been allocated, with knowledge of these gaps. Data gaps highlight the lack of comprehensive inventories.
Government of Germany	Summary for policymakers	1	1	29	30	Clarification needed: This sentence is misleading, because it is quite unlikely that the deep sea itself will be threatened by invasive species. The area is extremely dark, with zero light penetration, and has incredibly high pressures. It would be difficult for a species living in a coastal zone to live down in the deep sea. Therefore, only the margins will be affected.	Thank you, this is addressed with continental shelf ecosystems.
Government of Germany	Summary for policymakers	1	1	29	30	Need for clarification: Does "all biomes and regions are affected" mean that these biomes are impacted by IAS (due to an introduction) or that there is no single biome/region from which IAS do not originate?	Thank you, this has been clarified in the second order draft of the SPM
Government of Germany	Summary for policymakers	1	1	29	30	Proposal: "All biomes and regions are affected, including the margins of the deep sea and Antarctica." It is suggested to also mention the arctic here (see https://www.caff.is/strategies-series/415-arctic-invasive-alien-species-strategy-and-action-plan ; https://www.arcticbiodiversity.is/index.php/the-report/report-for-policy-makers/key-findings : "Key Finding 6: There are currently few invasive alien species in the Arctic, but more are expected with climate change and increased human activity".)	Thank you, we have deleted this part, and the comment is no longer relevant
EL Houdi, Khadija	Summary for policymakers	1	1	30	30	," including the margins of the deep sea and Antarctica": a distinction between terrestrial and marine invasive species could be helpful for decision makers	Thank you, we have deleted this part, and the comment is no longer relevant
Government of Germany	Summary for policymakers	1	1	30	30	Clarification needed: How are "deep sea" (below 200 meters depth?) and their "margins" defined? Also, is it "deep sea" (singular) or "deep seas" (plural)?	Thank you, we have deleted this part, and the comment is no longer relevant
Bliss, Cebuan	Summary for policymakers	1	1	32	37	But unlike the other direct drivers of biodiversity loss, IAS are part of biodiversity themselves	Thank you - we have clarified this point in A4 of the second order draft of the SPM
Government of Germany	Summary for policymakers	1	2	32	50	Proposal: Key message A3 and A5 seem to be closely interlinked and partly repetitive (role of climate change). We would suggest merging both into one key message.	Thank you, we have restructured the key messages accordingly in the second order draft of the SPM
Government of Netherlands (Kreiken, Bob)	Summary for policymakers	1	1	32	37	Again a strong causal relationship is suggested between invasive alien species and extinction. Please refer to the IPBES 2019 report to highlight the contribution of invasives in numerical figures among other drivers. Also, delete environmental change since this is a two-way relationship with invasive alien species.	Thank you. This has been introduced with more caution in the second order draft of the SPM. Authors assessed other sources of information, hence the slight difference in conclusion
Participants of ILK dialogue workshop (Guadalupe Yesenia Hernández Márquez)	Summary for policymakers	1	1	32	37	Section A3. Lines from 32- 37 Suggest to include the word “synergic” When the document talks about the increasing impact when more than one is present? Such as climate change plus land change use, etc.? This information is in lines 316 and 317.	Thank you - we have further developed this concept in various places.
Stiger-Pouvreau, Valérie	Summary for policymakers	1	1	32	34	Not necessarily true in the marine environment: new species create new habitats and this can increase biodiversity, in salt-marshes with the example of oyster reef as an example. "are OFTEN being driven".	Thank you, we have added some nuances to this statement in the second order draft of the SPM
Takahashi, Yasuo	Summary for policymakers	1	1	32	37	It'll be good to present "44 % of species extinction is caused primarily by invasive alien species" in this paragraph if this number presented in Figure SPM.2 is reliable	Thank you, we have removed this number as it was causing too much confusion in the second order draft of the SPM
Government of New Zealand (Perry, Joanne)	Summary for Policymakers	1	1	33	33	insert after "often through interactions with other <i>human mediated</i> drivers of global change".	Thank you, we have deleted this statement, and the comment is no longer relevant
Brooks, Thomas	Summary for policymakers	1	1	34	34	Add mention of "habitat destruction" (as the biggest driver of environmental change, and a major synergy with invasive alien species) before "climate change".	Thank you, we have deleted this statement, and the comment is no longer relevant

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	1	1	34	34	This could perhaps make reference to GABES. Suggest including the effect that IAS have on other IAS here, as it also interacts with the other major drivers	Thank you, this may be too detailed for a key message. Also, in the second order draft we have restructured the SPM to avoid overlaps
Government of Chile (Ministry of the Environment)	Summary for policymakers	1	1	34	35	It would be clearer if the text talk about specific drivers. The drivers named are the direct drivers, but the text just says "drivers" in a bread way. We suggest being specific and say "direct drivers", or to mention them and be specific through examples. For example, in the image in the line 467 where direct and indirect drivers are separated.	Thank you, this is now further developed in section B. We have chosen to stay away from the direct/indirect classification as much as possible to avoid confusion
Government of France	Summary for policymakers	1	1	34	34	Instead of "interactions amongst", we suggest to write "interactions with". Ideed, "interactions amongst" would mean that interactions between pressures others than biological invasions do exacerbate biological invasions, while we believe that what is meant is that biological invasions can be exacerbated by interacting with other types of pressure, which corresponds to what is developed in the "Background section".	Thank you, we have deleted this statement, and the comment is no longer relevant
Government of France	Summary for policymakers	1	1	34	37	The impacts of climate change on IAS development could be highlighted here, given its global impact on ecosystems worldwide	Thank you, this is now further developed in section B of the second order draft of the SPM
Government of Germany	Summary for policymakers	1	1	34	35	Proposal: It is suggested to list these drivers according to the order used in the IPBES summary for policymakers of the global assessment (2019), which states that "The direct drivers of change in nature with the largest global impact have been (starting with those with most impact): changes in land and sea use; direct exploitation of organisms; climate change; pollution; ...".	Thank you - we have decided not to include this reference to the IPBES summary for policymakers of the global assessment (2019) because of the importance of context in determining the rankings
Government of France	Summary for policymakers	1	1	35	35	The multiplicative and negative effect of alien invasive species depends on the spatial and temporal scale. There may be an increase in biodiversity at the local level but a homogenisation of species at the global level.	Thank you, this has been further clarified in section B of the second order draft of the SPM
Government of France	Summary for policymakers	1	1	35	35	There are also interactions with degradation including pollution.	Thank you - all the drivers are listed in the opening section of the SPM and where relevant throughout.
Government of Germany	Summary for policymakers	1	1	35	35	Clarification needed: Does the term "overexploitation of wildlife" correlate with the term "direct exploitation of organisms" which was used in the global IPBES assessment? It is suggested to ensure alignment in terminology across assessments, where possible.	Thank you, we have deleted this statement, and the comment is no longer relevant
Government of UK (Sarah Webster, Defra)	Summary for policymakers	1	1	35	35	A3 - replace "multiplicative" with "synergistic"	Thank you, we have deleted this statement, and the comment is no longer relevant
Government of USA	Summary for policymakers	1	1	35	35	Recommend clarifying the meaning/intent of "overexploitation of wildlife." and/or using a different term. Exploitation has a negative connotation.	Thank you, we have deleted this statement from the second order draft of the SPM, and the comment is no longer relevant
Jactel, Hervé	Summary for policymakers	1	1	35	35	There are also interactions with degradation including pollution.	Thank you - all the drivers are listed in the opening section of the SPM and where relevant throughout.
Pellens, Roseli	Summary for policymakers	1	1	35	35	The multiplicative and negative effect of alien invasive species depends on the spatial and temporal scale. There may be an increase in biodiversity at the local level but a homogenisation of species at the global level.	Thank you, this has been further clarified in section B of the second order draft of the SPM
Stiger-Pouvreau, Valérie	Summary for policymakers	1	1	35	35	The multiplicative and negative effect of alien invasive species depends on the spatial and temporal scale. There may be an increase in biodiversity at the local level but a homogenisation of species at the global level.	Thank you, this has been further clarified in section B of the second order draft of the SPM
Government of Belgium	Summary for policymakers	1	1	36	36	... increase in the rate of introduction, ESTABLISHMENT and spread	Thank you - the text has been substantially edited and this is no longer aligning with the second order draft of the SPM
Government of Chile (Ministry of the Environment)	Summary for policymakers	1	1	36	36	We suggest completing this line with: "Introduction, establishment and spread"	Thank you, this statement has been deleted, but this point is further clarified in Section B of the second order draft of the SPM
Government of Germany	Summary for policymakers	1	1	36	36	Clarification needed: Please expand on whether the term "... introduction ..." includes aspects related to the active, direct, indirect, and intentional or accidental introduction of IAS through human activities.	Thank you - the text has been substantially edited and this is no longer aligning now
Diaz, Sandra	Summary for policymakers	1	1	39	39	Replace "waters" by "water"	Thanks for this suggested change of wording - the plural is correct in this context
Maclean, Kirsten	Summary for policymakers	1	1	39	40	The word 'Indigenous' appears throughout the chapter with a small letter 'I'. Advise the editors/authors to capitalise 'Indigenous' whenever it occurs as this shows due respect to the value of Indigenous people, their knowledge and their contribution to this important area of work. This is the accepted practice among researchers and leaders (some of whom are also Indigenous) working with Indigenous peoples, leaders and research partners. As per the comment above, this reviewer advises that all instances in the document of 'Indigenous' have a capital 'I', at present the lowecase 'i' is used.	Thank you for your comment. While we agree that capitalising "Indigenous" may be the accepted practice among researchers, we follow the IPBES editorial guidelines and do not capitalise it..
Participants of ILK dialogue workshop (Guadalupe Yesenia Hernández Márquez)	Summary for policymakers	1	1	39	42	Section A4. 39-42 Suggest to include or mention socio-cultural, social, and economic impacts driven by the environmental impacts produced by invasive alien species.	Thank you, we have made this point clear in Section A
Diaz, Sandra	Summary for policymakers	1	1	40	40	replace "biological invasions" with "invsive alien species"	Thank you, this has been deleted in the second order draft of SPM. Also note that we try to refer to biological invasions (as a process) rather than to IAS, where possible
Government of Canada (Chakravarty, Bipasha)	Summary for policymakers	1	1	40	41	When alien invasive species are accepted and adapted by indigenous populations, and are economically viable can they still pose as a threat to the population?	Thank you for this comment. The assessment experts recognize that some IAS can have benefits but these do not negate the negative impacts, which are far more numerous
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	1	1	40	42	I think the intent here may be to say that some communities have been able to draw some benefits from alien species, but overall impacts are negative. Communities have been forced to adapt to invasives, so it is unclear what is meant by a failure to adapt.	Thank you, this point has been added as a general point in the revised version (not only for IPLCs)
Government of Germany	Summary for policymakers	1	1	40	40	Clarification required: Should it read "good quality of life" or rather "quality of life" because the quality of life could be affected in any case, irrespective of whether it is good or not that good anymore?	Thanks for this suggested change of wording. It is an improvement and we have adopted it, where relevant in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Mexico	Summary for policymakers	1	1	40	42	When referring to "communities" in line 41 it seems like IA Only affect local communities, so it could be changed to "human populations". This line in paragraph A4 could read: "In some situations human populations have adapted to the presence of some invasive alien species, but for many others biological invasions represent a serious threat."	Thank you, we have added some nuances to this statement in the second order draft of the SPM
Government of USA	Summary for policymakers	1	1	40	41	This supports my second comment.	Thank you for your comment
Kamal Kumar Rai	Summary for policymakers	1	1	40	42	The threats could be linked the IPLCs' traditional way of life (Case studies), views, experiences, interactions, control or good cultural practices and innovation. It is important to bring up the historical cases and the practical mechanism of IAS impacts, causes, drivers in the lands, ecosystems and territories of IPLCs. Policies related to land use changes, education of modern development, social changes, communication, science and technologies, modern development and its activities can all influence the IPLCs to adopt new ideologies on their lands, waters, ecosystems, nature and historical territories. Often IAS and other developments are introduced without EIA, socio-cultural and economic impacts assessment. The result is IAS and their impacts on the lands, waters and territories of IPLCs today. Therefore, the assessment needs to clearly reflect the synergies of impacts, dispersal agents, causal effects or mediations of IAS and its dispersion in lands, waters, ecosystem and territories and the mechanism to protect the values, ILK systems, and collective customary practices of IPLCs. Also, it needs to bring information of previous, present and future consequences that will cause a crisis for IPLCs, and explore way forward.	Thank you, many case studies can be found in the chapters, but we have modified the key messages in the second order draft of the SPM taking this comment into account
Lang, Iris	Summary for policymakers	1	1	40	42	In some situations communities have adapted to the presence of some invasive alien species, but in most cases this is not true.	Thank you, we have clarified this point in the second order draft of the SPM
Lieurance, Deah	Summary for policymakers	1	1	40	40	Remove 'good'. It adds nothing to the statement	Thanks for this suggested change of wording. It is an improvement and we have adopted it, where relevant in the second order draft of the SPM
Government of Australia	Summary for policymakers	1	1	42	44	Replace sentence starting "Because..." with "Due to current social inequalities and imposed gender roles women have been especially affected by invasive alien species, threatening their own livelihoods and families."	Thanks for this suggested change of wording - we have made some changes in the second order draft of the SPM
Government of France	Summary for policymakers	1	2	42	44	It might be needed to stress that certain societies are more likely to be able to tackle the impacts of IAS than others (across all genders, social groups, etc.), i.e., to bare in mind the society scale.	Thank you, we have added a paragraph on unequal impacts of biological invasions to the second order draft of the SPM
Government of France	Summary for policymakers	1	2	42	44	To improve the syntax, we suggest to rephrase the end of the paragraph as follows: "Likewise, because of current social inequalities and imposed gender roles, women have been especially affected by invasive alien species (...)"	Thanks for this suggested change of wording. It is an improvement and we have adopted it in the second order draft of the SPM
Government of Germany	Summary for policymakers	1	2	42	43	Proposal: It is suggested that some details be included here to understand how social inequalities and imposed gender roles expose women in particular to IAS. Such details would strengthen this statement. The statement currently sounds rather ideological.	Thank you - we have altered the wording in the second order draft of the SPM
Government of Germany	Summary for policymakers	1	2	42	44	Proposal: It is suggested to recast the sentence as follows "Likewise, women have been especially affected by invasive alien species threatening their family and their own livelihoods, mostly because of current social inequalities and imposed gender roles."	Thanks for this suggested change of wording. It is an improvement and we have adopted it in the second order draft of the SPM
Lang, Iris	Summary for policymakers	1	2	42	44	This very interesting point on social inequalities and the impact of invasive species on women could be developped here because it deserves to be more explicite. The link is not clear. (maybe juste give an example ?)	Thank you, we have developed this paragraph accordingly in the second order draft of the SPM
Lieurance, Deah	Summary for policymakers	1	2	42	44	Consider rewriting sentence: "Likewise, because of current social inequities and imposed gender roles, women have been affected by invasive alien species threatening their livemihoods and families."	Thank you, this has been added in the second order of the SPM
Maclean, Kirsten	Summary for policymakers	1	1	42	42	likewise women' -does this mean Indigenous women and women from local communities, or women in general? Suggest that this needs a qualifier, as to state that is the situation of all women across the world, is quite a sweeping statement. Already these statements are very 'sweeping' but understand that this is necessary for a policy brief.	Thanks for this suggested change of wording. We have altered the sentence to include the statement "In some communities"
Grossart, Hans-Peter	Summary for policymakers	1	2	44	47	It remains unclear why indigenous women are more impacted bay invasive alien species, please briefly explain.	Thank you for your suggestion - the wording has been changed in the second order draft of the SPM
Government of Netherlands (van Delft, Jeroen)	Summary for policymakers	1	39	342	342	Figure SPM 2: Graph in the lower left corner of this figure. IAS are presented as relatively the most important driver for extinctions ("Percentage of extinctions for which the driver is listed"). Might it be possible that the other causes in this graph can far less clearly be linked to concrete extinctions than IAS, leading to less listed drivers for extinctions? This figure is in my opinion a very strong, visual and explicit one. It might become one of the most widely used ones in the media after publication. If the importance of IAS is partly caused by research bias (underestimation of the influence of causes other than IAS) and can be debated, this might become a problem in communication.	Thank you, in the second order draft of the SPM, we have changed the figure to focus on local extinctions
Evans, Thomas	Summary for policymakers	2	2	44	44	families (instead of family)? Actually maybe '... which threaten their own livelihoods and their families.'	Thank you for your suggestion - the wording has been changed and "families" has been removed from the second order draft of the SPM
Kamal Kumar Rai	Summary for policymakers	2	2	44	44	Case studies on gender would be appreciated	Thank you examples on gender are available in the chapters
Eckbo, Norith	Summary for policymakers	2	2	46	48	It could be interesting to bring in knowledge on how different countries can succeed based on their differences and similarities, and the presence of other drivers for ecosystem change.	Thank you, this assessment being a global assessment on invasive alien species cannot include a detail inventory of practices for all countries. However, some trends and solutions are identified (see sections C and D)
Furukawa, Takuya	Summary for policymakers	2	2	46	50	The message of A5 is relatively weak. You might want to merge it with A3 (P1 L32-37), which contains similar points, or rephrase A5 to make it more relevant to policymakers. The statement in P11 L322-324 is better phrased as it states that because of the uncertainty there is a need for a broad range of options for the management of IAS.	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM and so this comment does not align now.
Government of Australia	Summary for policymakers	2	2	46	46	Replace "societal, economic, and environmental" with "societal, institutional, economic, and environmental"	Thank you, in the second order draft, we have removed economic and only kept societal and environmental, which encompass economic and institutional
Government of Canada (Fraleigh, Brad)	Summary for policymakers	2	2	46	50	add to the end of the paragraph: "...and underpin the need for a broad range of options to manage invasive alien species". This is stated in the background but is important in the Key Messages too.	Thank you for your suggestion - we have added a statement on management options to the second order draft of the SPM
Government of China	Summary for policymakers	2	2	46	47	Revised to "amongst societal, economic, environmental factors and the nature of invasive alien species".	Thank you, in the second order draft of the SPM, we have removed economic and only kept societal and environmental, which encompass the nature of invasive alien species
Government of Germany	Summary for policymakers	2	2	46	50	Proposal: This paragraph begins by mentioning societal and economic factors, but then only expands on environmental factors. This could be amended in one or two sentences.	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Lang, Iris	Summary for policymakers	2	2	46	49	Climate change is already cited in paragraph A3 so it could be remove here. As societal, economic factors are announced here, it can be : management practices, land use, perception of invasive species, etc.	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM
Nunes, Ana	Summary for policymakers	2	2	46	49	The 2 first sentences do not seem to link, as I believe the first one is not referring to other drivers, but yet to other factors that can affect invasions.	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Participants of ILK dialogue workshop (Guadalupe Yessenia Hernández Márquez)	Summary for policymakers	2	2	46	50	Section A5. If you mention "Uncertainty" referred to the future impacts, those who are not aware of the importance of IAS could have arguments to avoid the problem. The proposal is some wording such as: "however, the precatory approach, must be used, recall, etc.	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Government of France	Summary for policymakers	2	2	47	48	It is said above that they have strong negative impacts overall. This is not clear. Perhaps we should better explain what is difficult to predict: magnitude, type of impact.	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Jactel, Hervé	Summary for policymakers	2	2	47	48	It is said above that they have strong negative impacts overall. This is not clear. Perhaps we should better explain what is difficult to predict: magnitude, type of impact.	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	2	2	48	49	This repeats material from A3. The complexity does not add to the problems of IAS, but to the challenges of management. Suggest re-casting and combining with A6 "Limited data and complex interlinkages amongst social, economic, and environmental factors create management challenges. While knowledge is increasing, the occurrence and outcomes of biological invasions are difficult to predict. Gaps and biases in existing information, including the distribution, dynamics, impacts and management outcomes, hamper understanding and decision-making."	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Government of France	Summary for policymakers	2	2	48	49	The sentence "Indeed, there are complex interactions ... " looks redundant with A3	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM and so this comment does not align now.
Government of France	Summary for policymakers	2	2	49	49	Perhaps also stress that often alien invasive species were not known before they have been introduced: "unknown unkwns"	Thank you, we emphasize this point in a paragraph on lags (section B) of the second order draft of the SPM
Government of Netherlands (Groenewoud, H. E.)	Summary for policymakers	2	2	49	50	"The level of complexity and associated uncertainty adds significantly to the problems presented." This is a statement, but I am at a loss as for the base for this statement. What does the author want to make clear?	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Henk, Groenewoud	Summary for policymakers	2	2	49	50	"The level of complexity and associated uncertainty adds significantly to the problems presented." This is a statement, but I am at a loss as for the base for this statement. What does the author want to make clear?	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Jactel, Hervé	Summary for policymakers	2	2	49	49	Perhaps also stress that often alien invasive species were not known before they have been introduced: "unknown unkwns"	Thank you, we emphasize this point in a paragraph on lags (section B) of the second order draft of the SPM
Lieurance, Deah	Summary for policymakers	2	2	49	49	Consider changing to "biodiversity loss" and perhaps to add the driver land and sea change	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Takahashi, Yasuo	Summary for policymakers	2	2	50	50	"problems <u>caused</u> by IAS"?	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Bliss, Cebuan	Summary for policymakers	2	2	52	56	Another bias in that most information available is ecological, there is a lack of information about governance and social factors	Thank you, please see the revised version of the table in Annex III of the second order draft of the SPM
Government of Canada (Alexander, Steven)	Summary for policymakers	2	2	52	54	Impacts' is used three times in this sentence resulting in some confusion and need for clarity.	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Government of Chile (Ministry of the Environment)	Summary for policymakers	2	2	52	52	We suggest completing this line with also adding the gaps in introductions pathways . An example in line 643.	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Government of France	Summary for policymakers	2	2	52	52	Management should be distinguished from pure environmental costs.	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM and so this comment does not align now.
Government of France	Summary for policymakers	2	2	52	56	sentence too complex. Consider splitting; Gaps in knowledge about the distribution, dynamics, impacts and management of invasive alien species exist across all biomes, taxonomic groups, impacts and regions. These hamper the understanding of trends, status and impacts of biological invasions.	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM and so this comment does not align now.
Government of Germany	Summary for policymakers	2	2	52	56	Proposal: Key message A6 on knowledge gaps is extremely important. Intensive research on invasive species has been going on for more than 20 years, especially in the marine sector. It is obvious that there are country-specific knowledge gaps. There is also a bias in data availability towards "more developed" regions and countries, where there are proportionally few indigenous peoples and local communities. However, we would welcome more precise information on main areas of knowledge gaps: which biomes and countries should gain increasing attention by research (e.g. see Table SPM.1)? For this, it is suggested to start the paragraph with a statement of over 20 years of intensive research followed by addressing knowledge gaps.	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Government of Ireland (Nelson, Brian)	Summary for policymakers	2	2	52	56	A6 could be worded better, avoiding the two uses of impacts in the first sentence. Perhaps this suggestion? "Knowledge about the distribution, dynamics, impacts and management of invasive alien species is biased and these hamper the understanding of trends, status and impacts of biological invasions. Gaps in knowledge exist across all biomes, taxonomic groups, impacts and regions. Much of the evidence on the impacts of invasive alien species is drawn from terrestrial and freshwater biomes in a limited number of countries."	Thank you, A6 has been deleted and the comment is no longer relevant
Government of Mexico (Koleff, Patricia)	Summary for policymakers	2	2	52	56	Need to highlight the importance of information at local scale, and instead of: "from terriatrial biomes", would be better to say from terrestrial and freshwater ecosystems"	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Lieurance, Deah	Summary for policymakers	2	2	52	56	I wonder if this could be expanded a bit....not as much information about impacts of plants as opposed to other organisms and also which countries providing information and where are the biggest gaps.	Thank you, we have deleted A6, and this comment is no longer relevant
Pellens, Roseli	Summary for policymakers	2	2	52	56	sentence too complex. Consider splitting; Gaps in knowledge about the distribution, dynamics, impacts and management of invasive alien species exist across all biomes, taxonomic groups, impacts and regions. These hamper the understanding of trends, status and impacts of biological invasions.	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM and so this comment does not align now.
Tassin, Jacques	Summary for policymakers	2	2	52	56	Maybe it should be added that such uncertainty and gaps of knowledge make invasion ecology a speculative disciplina within ecology.	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM and so this comment does not align now.

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Nunes, Ana	Summary for policymakers	2	2	53	53	Not sure if this is a typo, but I would suggest removing the word 'impacts' in this line	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Eckbo, Norith	Summary for policymakers	2	2	54	56	Consider adding a sentence of what types of needs there are.	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
EL Houdi, Khadija	Summary for policymakers	2	2	55	55	"There is a bias in availability of information"the report should shed light on the regions or ecosystems that lack the most this information and that's the message for policy akers: allow more financial support or more international cooperation	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Bharat, Alka	Summary for policymakers	2	2	56	56	Add line; cases and best practices	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Diaz, Sandra	Summary for policymakers	2	2	56	56	"limited number of countries" is not really very informative. Can you give more precision as to what region, content. Hemisphere?	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Evans, Thomas	Summary for policymakers	2	2	56	56	Could you say '...limited number of countries that tend to be within wealthy, developed regions of the world'?	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Government of Australia	Summary for policymakers	2	2	56	56	And add phrase ", while data about the social impacts are lacking"	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Government of Canada (Ariey-Jouglaard, Rachel Tu-Van)	Summary for policymakers	2	2	56	56	Clarity of what is included within "terrestrial biomes" may be helpful, both in the Summary for Policymakers and in the chapters. Indeed, it would be useful to know if the bias is on all terrestrial IAS or on specific taxa within it (e.g., invasive plants, insects, etc.).	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Government of Chile (Ministry of the Environment)	Summary for policymakers	2	2	56	56	We suggest including all biomes: freshwater and marine or ocean	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Government of France	Summary for policymakers	2	2	56	56	Particularly in southern countries where scientific research is still underdeveloped (African continent, South East Asia)	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Jactel, Hervé	Summary for policymakers	2	2	56	56	Particularly in southern countries where scientific research is still underdeveloped (African continent, South East Asia)	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Uludag, Ahmet	Summary for policymakers	2	2	56	56	But we should not forget vast amount of species are terrestrial including invertebrates. At least known creatures. Maybe need some small addition.	Thank you for your suggestion - the text has been changed substantially and so this comment does not align now.
Government of Netherlands (Kreiken, Bob)	Summary for policymakers	2	2	57	73	Finding in B.1. was already highlighted in B. so it would be better to merge the paragraphs.	Thank you, we have removed overlaps with the introductory paragraph in the second order draft
Government of Netherlands (Kreiken, Bob)	Summary for policymakers	2	2	78	80	The intentional introduction of invasive alien species is an interesting point but should not be covered under trade. Please specify why intentional introductions are facilitated.	Thank you for your suggestion - the text has been changed substantially in the second order draft according to the comments.
Government of Netherlands (Kreiken, Bob)	Summary for policymakers	2	2	93	94	Is this because humans live more closely and hence would introduce invasive alien species faster (human activity), or merely because of the degradation of the ecosystem (resilience of ecosystem)?	Thank you for this comment - this section has changed substantially but it could be a consequence of both the mechanisms described. Resilience of ecosystems is considered throughout the SPM.
Government of Australia	Summary for policymakers	3	4	57	113	Section B is good; nothing significant to report	Thank you for your feedback.
Government of Germany	Summary for policymakers	3	3	57	57	Clarification needed: What does "intensification" mean? Does it include aspects increase/escalation, sharpening, concentration, spatial expansion, and spatial scale?	Thank you, we have replaced intensification by "rapid acceleration" in the second order draft
Government of Germany	Summary for policymakers	3	3	57	58	Proposal: Key message B seems to be repetitive - it has been stated earlier already several times that humans cause an increase in IAS (p. 1 l. 18, p. 1 l. 7). We suggest to rather present some findings on global patterns of impacts in this key message.	Thank you, we have revised this introductory paragraph as suggested
Sathyapala, Shiroma	Summary for policymakers	3	3	57	68	suggest to add small brief on impact of pandemics on IAS related activities and projects around the world - The COVID-19 has significant impact on prevention and management activities of IAS on the ground as countries used different pandemic protocols for distancing and safeguard (delays to implementation of projects, cancellation of field surveys, reduced control activities, and ongoing monitoring programs have been interrupted, delays to rapid identification and management of biological invasions) In future the countries are necessary consider his risk factor in their projects and planning of IAS activities	Thank you for your suggestion although we agree that COVID-19 is an important consideration and we have referred to it within the chapters we have been cautious to ensure we have not given disproportionate attention to it.
Eckbo, Norith	Summary for policymakers	3	3	59	60	This sentence is difficult to grasp the meaning of.	Thank you, we have reworded this sentence in the second order draft of the SPM
Government of Argentina	Summary for policymakers	3	3	59	68	This paragraph says that capacity to manage biological invasions varies around the world. This is very true, and in particular, it varies between developed and developing countries. We suggest to clarify this difference as follows: "Capacity to manage biological invasion varies around the world, in particular between developed and developing countries, but there is a need..."	Thank you, this part of the sentence has been deleted and the comment is no longer relevant.
Government of Argentina	Summary for policymakers	3	3	59	68	Why does the first historical reference goes back only 50 years? As far as we know, the impact of invasive alien species in our continent was intensified since colonization. In our view, this paragraph should start acknowledging the role of colonization in the expansion of invasive alien species worldwide.	Thank you for this comment - this section has changed substantially in the second order draft of the SPM but we have added context on dates throughout.
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	3	3	59	68	this is excellent	Thank you for your comment
Romero, José A.	Summary for policymakers	3	3	59	59	To be consistent with the section title, write: "...the intensification of anthropogenic drivers..."	Thank you, this part of the sentence has been deleted and the comment is no longer relevant.
Diaz, Sandra	Summary for policymakers	3	3	61	62	sentence "there is no sign" could be eliminated. It is confusing (is this no sign referring to all global change drivers (might not be 100% true) or invasive alien species only? And in any case, it is said much more clearly in the next KM.	Thank you for your suggestion. In the second order draft of the SPM, we have slightly rephrased the sentence, but kept the phrase "there is no sign", as per the original publication.
Evans, Thomas	Summary for policymakers	3	3	61	61	Could you put 'shows no sign of slowing' at the end of this line? It might read more concisely. Indeed I'm not sure what the 'rate of global change' refers to here? Is it 'biodiversity change' as in the first line of this paragraph? Maybe: 'The rate of global change in biodiversity, including the accumulation of invasive alien species, shows no sign of slowing over time'?	Thank you, we have reworded this sentence, and taken your comment into account in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Germany	Summary for policymakers	3	3	61	62	Proposal: The statement "There is no sign of slowing in the rate of global change including the accumulation of invasive alien species over time." is obviously too sweeping. Figure SPM.3 (L401) shows that, at least for mammals, the rate seems to be decreasing overall. This should be mentioned.	Thank you, these is a global statement.
Government of Australia	Summary for policymakers	3	3	62	64	Suggest repace "it is difficult..." with " Predicting the future magnitude of the threat from invasive alien species is complex due to interactions amongst drivers of change within different contexts and at varying spatial and temporal scales. " The statement as it stands is a scientific assessment but will not translate well into policy understanding and is open to misinterpretation	Thank you, in the second order draft of the SPM, we have rephrased this statement and it hopefully addresses your concerns.
Government of France	Summary for policymakers	3	3	62	63	this sentence can be deleted because it has already been said in the part A5	Thank you for your suggestion - the text has been changed substantially in the second order draft according to the comments.
Jactel, Hervé	Summary for policymakers	3	3	62	63	this sentence can be deleted because it has already been said in the part A5	Thank you for your suggestion - the text has been changed substantially in the second order draft according to the comments.
Takahashi, Yasuo	Summary for policymakers	3	3	62	66	It'll be straightforward to swap these two sentences, i.e., "The impacts of invasive alien species on nature, nature's contribution to people and good quality of life are anticipated to increase dramatically in the future. The magnitude of the future threats, however, cannot be easily projected because of the complexity of the interactions amongst drivers of change within different contexts and at varying spatial and temporal scales."	Thank you, we have removed this reference from the second order draft of the SPM to impacts to reduce repetitions.
Eckbo, Norith	Summary for policymakers	3	3	64	66	This sentence would be easier to understand if there was more information as to why this is anticipated. Consider adding a sentence explaining why the impacts are anticipated to increase.	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Uludag, Ahmet	Summary for policymakers	3	3	64	68	The importance of every citizen's involvement should be stressed to show the complexity of the problem.	Thank you this is developed in the key messages but authors think it doesn't fit under this introductory paragraph
Government of Germany	Summary for policymakers	3	3	65	66	Proposal: The statement "the impacts of invasive alien species on nature (...) are anticipated to increase dramatically in the future" seems to be somewhat contradictory to the fact that knowledge about IAS distribution and abundance is fragmentary and uncertain for many biomes, countries etc. (cf. Chapter 2, p. 1, L29-L39) and that it is "difficult to project the future magnitude of the threat from IAS" (L62-L63). You might want to re-formulate the phrases more carefully and you might also want to consider substituting "dramatically" with "drastically". Furthermore, the statement - though alarming - is very general. Is there more precise scientific evidence for the rate of increase and respective time horizons?	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
EL Houdi, Khadija	Summary for policymakers	3	3	66	67	"Capacity to manage biological invasions varies around the world"here also the highlight of the regions lacking the most the capacities could draw more capacity building for those areas or countries	Thank you, this is developed in the key messages and background but is too detailed for an introductory paragraph
Government of Australia	Summary for policymakers	3	3	66	66	Replace "Capacity" with "Capacity and capability"	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Government of Belgium	Summary for policymakers	3	3	66	68	This sentence may be better placed in section C (management)	Thank you, we have deleted this sentence in the second order draft of the SPM
Government of Chile (Ministry of the Environment)	Summary for policymakers	3	3	66	67	We suggest completing this line with: Introduction, establishment , spread and impacts of invasions	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Government of France	Summary for policymakers	3	3	66	68	This sentence corresponds more closely to part C on the management of alien invasive species. Here we focus on pressure and impact drivers	Thank you for your suggestion - the text has been changed substantially in the second order draft according to the comments.
Grossart, Hans-Peter	Summary for policymakers	3	2	66	67	"Capacity to manage biological 66 invasions varies around the world..." Can you briefly describe where the hotspots of invasive alien species are in the world? It should be clear for politicians around the world what tp expect...	Thank you, this is developed in the key messages and background but is too detailed for an introductory paragraph
Takahashi, Yasuo	Summary for policymakers	3	3	66	68	This sentence deviates from what the key messages in the section states. This perhaps intends to say "Policies intended to address environmental changes, including climate change and invasive alien species spread, can rather accelerate biological invasion?"	Thank you, this sentence has been deleted in the revised version and this comment no longer applies
Government of Belgium	Summary for policymakers	3	3	67	67	Missing word? "... to ensure effective measures THAT are available to everyone..."	Thank you, this has been addressed in the second order draft of SPM
Government of UK (Mortimer, Diana)	Summary for policymakers	3	3	67	68	delete words 'but there is a need to ensure' and 'are available to everyone' in this sentence and replace with 'can be used' otherwise this sentence is prescriptive.	Thank you for your suggestion - in the second order draft of the SPM the text has been changed substantially according to the comments.
Kamal Kumar Rai	Summary for policymakers	3	3	68	68	Is this only assessing plants and animals in Nature? How about microorganisms, including human introduced species, science and technological innovation that are native to certain types of ecosystem but it is acting as an invasion to other ecosystems. The understanding and means of Nature and its contribution to peoples and good quality of life in IPLCs is different, it needs to be assessed differently. ILK plays a vital role and responsibilities to mitigate or manage the future crisis to the life in Nature. The Capacity enhancement must be a priority for IPLCs, including women and youth as culturally appropriate. To assess the bio-chemical, microbiome composition and interaction in the ecosystem and environment including social factors that affect the succession of IAS in particular. Taxonomic ILK also plays an important roles for identification, description and mitigation. Need to recognise and respect the indigenous sciences, technology and society.	Thank you, microorganisms are also assessed (authors noted considerable knowledge gaps for microorganisms and fungi). IPLC management of IAS is addressed in the next section. Knowledge and governance with IPLCs are covered in Section D.
Nunes, Ana	Summary for policymakers	3	3	68	68	Suggest to add 'everyone to prevent and manage the threat of biological invasions.'	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Setsaas, Trine Hay	Summary for policymakers	3	3	68	68	"everyone" could be changed to "all levels of society"?	Thank you for your suggestion. In the second order draft of the SPM, the text has been changed substantially according to the comments.
EL Houdi, Khadija	Summary for policymakers	3	3	70	71	"The number of recorded alien species has been increasing worldwide, with a sharp rise 40%) between 1970 and 2015"Are there any new records since 2015?are we in the same trend?Is there any assessment of the Corona19 pandemic impact and all the measures taken by countries such as lockdowns on this trend?	Thank you. COVID-19 is acknowledged in this report, noting that viruses are not species. We have deleted this sentence and the comment no longer applies.
Government of Argentina	Summary for policymakers	3	3	70	71	Why does this paragraph focuses on the sharp rise between 1970 and 2015? We would like to see a reference to the impact of colonization regarding invasive alien species, otherwise this approach will focus only on recent impacts and will make long term policy making more difficult.	Thank you for this comment - we have used this time period because of the quality of data for this time period but we describe longer trends within the text.
Government of Chile (Ministry of the Environment)	Summary for policymakers	3	3	70	73	We suggest changing the drafting adding anthropogenic driver, globalization, and traceability	Thank you, we have decided to make this sentence more general (other drivers of biodiversity change)

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Germany	Summary for policymakers	3	3	70	71	Clarification needed: In L379-L380 you state that "Trends of rising records of alien species are influenced by rising research efforts (well established)". Therefore, please expand on what criteria were used for assessing the 40% rise between 1970 and 2015? Rationale: This is to ensure that the rise between 1970 and 2015 doesn't (solely) reflect the rise in research efforts between 1970 and 2015.	Thank you, the methodology is available in the data management report, see also Chapter 2, section 1.2
Government of Germany	Summary for policymakers	3	3	70	73	Proposal: Key message B1 highlights the finding that there has been an increase in alien species of 40% in a time span of 35 years. On p.1, L5-L6, it was stated that approx. 10% of alien species are considered as invasive. Breaking this down to key message B1 implies an increase of 4% of invasive alien species in 35 years. This figure might not sound dramatic, hence it would be very helpful to have a useful reference to, for instance, what the "normal/natural" rate of IAS would have been.	Thank you, this has been revised and the comment is now no longer relevant.
Government of Germany	Summary for policymakers	3	3	70	73	Proposal: Key message B1 highlights the finding that there has been an increase in alien species of 40% in a time span of 35 years. On p.1, L5-L6, it was stated that approx. 10% of alien species are considered as invasive. Breaking this down to key message B1 implies an increase of 4% of invasive alien species in 35 years. This figure might not sound dramatic, hence it would be very helpful to have a useful reference to, for instance, what the "normal/natural" rate of IAS would have been.	Thank you, this has been revised and the comment is now no longer relevant.
Government of Mexico	Summary for policymakers	3	3	70	71	For policy makers who don't have a scientific background it may not be clear if "the number of IAS recorded" means the number of species (taxa) that are becoming invasive or the detection of new locations where IAS (invasiones) are being identified.	Thank you, we have changed "recorded" to "documented" in the second order draft of the SPM
Government of Norway (Pedersen, Åsa)	Summary for policymakers	3	3	70	72	The important message in this paragraph is not only that number of recorded alien species has increased the last 50 years, but also that this trend is still continuing. Ideally this point should be included in the bold statement, and we suggest adding the following to the bold sentence: "...between 1970 and 2015, and there is no sign that this trend is slowing globally."	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Lieurance, Deah	Summary for policymakers	3	3	70	73	I think this point could be more impactful to the reader if it was reordered so you start with the points about IAS and finish with what is predicted to make it worse...after "Given the" I would first mention the international movement of species (expand from just # of invasive species), then impacts and then finish with the intensification of anthropocentric drivers. I would also add the specific drivers here that relate to IAS...CC and land/sea use change. This would flow very nicely into B3 for the reader.	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments
Nunes, Ana	Summary for policymakers	3	3	70	71	Not very clear what is meant by 'recorded alien species', does this mean species introduced worldwide, or established, or transported by humans?	Thank you, we have changed "recorded" to "documented" in the second order draft of the SPM
Participants of ILK dialogue workshop (Guadalupe Yesenia Hernández Márquez)	Summary for policymakers	3	3	70	73	Section B1. 70-73. Does this a little bit contradict the information mentioned in lines 46 to 50?	Thank you, we have revised lines 46 to 50 to clarify.
Government of France	Summary for policymakers	3	3	71	71	Explain why we have this rising, e.g. globalisation of the economy	Thank you for your suggestion - in the second order draft of the SPM, the text has been changed according to the comments to include the mechanisms behind the rise.
Jactel, Hervé	Summary for policymakers	3	3	71	71	Explain why we have this rising, e.g. globalisation of the economy	Thank you for your suggestion - in the second order draft of the SPM, the text has been changed according to the comments to include the mechanisms behind the rise.
Government of Germany	Summary for policymakers	3	3	72	73	Proposal: The statement "the number of invasive alien species, and their impacts, are projected to increase substantially in the future" is questionable. In particular, due to the implementation of corresponding legal instruments that have already taken place, for example in the EU, no increase in impact is to be expected in the future. This should be mentioned.	Thank you for your comment. Evidence suggest that current policies are not sufficient to address targets on biological invasions
Kamal Kumar Rai	Summary for policymakers	3	3	74	74	ILK databases / monitoring by IPLCs is important	Thank you, this is developed in the next sections of the second order draft of the SPM
Government of Australia	Summary for policymakers	3	3	76	76	Remove 'in particular'. Begin sentence with " There are clear links..."	Thank you, we have revised this sentence accordingly in the second order draft of the SPM
Nunes, Ana	Summary for policymakers	3	3	77	77	Need to add a comma as follows 'and movement of goods and people, and the introduction and ...'	Thank you, we have revised this sentence accordingly in the second order draft of the SPM
Taki, Hisatomo	Summary for policymakers	3	3	77	77	In addition to goods and people, can other living organisms be causing too?	Thank you for your comment - movement with other living organisms is relevant but the movement of the living organisms is through transport and trade by humans
Government of Chile (Ministry of the Environment)	Summary for policymakers	3	3	78	78	It is not clear if aquatic includes freshwater and ocean. We suggest making it clear.	Thank you, we have clarified this point in the second order draft of the SPM
Government of France	Summary for policymakers	3	3	78	80	Reformulate the sentence: "There are many examples of major alien species invasions due to intentional introductions into terrestrial and freshwater ecosystems, unlike marine ecosystems where most introductions are unintentional".	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments. Unintentional introductions are important in all environments - we have updated the text accordingly.
Grossart, Hans-Peter	Summary for policymakers	3	3	78	80	Provide a brief explanation, why the introduction of invasive alien species in the marine systems is unintentionally?!	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments. (see background para 1.)
Lieurance, Deah	Summary for policymakers	3	3	78	80	I wouldn't diminish the role of unintentional introductions in freshwater and terrestrial environments (e.g. transport contaminants on plants is in seed or gravel)	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	3	3	79	80	this leads the reader to wonder if intentional or unintentional introductions are more common in terrestrial and freshwater	Thank you for your suggestion - the text has been changed substantially according to the comments. This is now in A1 of the second order draft of the SPM
Government of Chile (Ministry of the Environment)	Summary for policymakers	3	3	79	80	We suggest to re-draft the phrase. Looks like the comparison is among ecosystems, but the unintentional introduction of IAS is in all ecosystems the same. The intentional ones are more present in terrestrial and freshwater.	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments. This is now in A1
Government of Mexico (Koleff, Patricia)	Summary for policymakers	3	3	79	80	It is important to highlight island (might not be clear as "terrestrial" sometimes their are included in marine environments, but in islands IAS have been intruded intentionally, so should say: "... "terrestrial, island and freshwater"	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments. This is now in B2
Government of France	Summary for policymakers	3	3	80	80	Suggestion to delete "marine" because most of terrestrial introductions are also unintentional (at least in forests)	Thank you for your comment - the text has been clarified in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Jactel, Hervé	Summary for policymakers	3	3	80	80	Suggestion to delete "marine" because most of terrestrial introductions are also unintentional (at least in forests)	Thank you for your comment - the text has been clarified in the second order draft of the SPM
Kamal Kumar Rai	Summary for policymakers	3	3	80	80	Besides humans, what other important agents can help disperse IAS? Policy and approach for traders and transporters regarding IAS would be important. Also, education, communication, awareness and capacity building around IAS may be required to achieve policy goals.	Thank you, please refer to Figure SPM.4 or Chapter 3 on drivers for more information. Please refer to Chapter 6 for more details on the requirements to achieve policy goals. Figure SPM.7 also outlines requirements for integrated governance for IAS
EL Houdi, Khadija	Summary for policymakers	3	3	82	82	." Considerable interval (time lag) may occur between "the policy makers do need to know approximately how much time the impacts could be seen, otherwise, no action would be taken if the time lag s not estimated. Within the political mandate!	Thank you. In the second order draft of the SPM, we now emphasize the importance of the precautionary approach, which is relevant for policymakers
Evans, Thomas	Summary for policymakers	3	3	82	82	Do you need the word 'interval' here? Why not just use time lag(s)? Maybe: Considerable time lags may exist between the first record of an alien species introduction and the first record of its impacts.	Thank you, we have edited the text accordingly in the second order draft of the SPM
Government of Argentina	Summary for policymakers	3	3	82	83	If this time lag is true, can we say with certainty that the data between 1970 and 2015 corresponds to species introduced in that time-period?	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Government of Belgium	Summary for policymakers	3	3	82	88	Possibility to provide indicative values concerning the length of the time lag?	Thank you we have added "(i.e., years, decades)"
Government of Canada (Chakravarty, Bipasha)	Summary for policymakers	3	3	82	88	An alien species that is not yet invasive or causing harmful effects presently, can do so in the future because of the 'time lag', so we cannot delimit or define invasive species completely until their impacts are detected which sometimes takes years to recognize,	Thank you, we agree with the reviewer
Government of France	Summary for policymakers	3	3	82	83	In order for species to be considered as invasive, its impacts must have been reported (transition from a sole alien species to an IAS). Reformulate: "Considerable interval (time lag) may occur between the introduction of an alien species and the record of its impacts as an invasive alien species."	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Government of France	Summary for policymakers	3	3	82	88	This paragraph B3 seems less important than the following B4 and B5 : Move this paragraph further down, after the paragraph on islands ?	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Government of Ireland (Nelson, Brian)	Summary for policymakers	3	3	82	83	This alternative wording is suggested "Considerable time may occur between the introduction of an invasive alien species and detection of its impacts".	Thank you. In the second order draft of the SPM, we have changed it to "Considerable time (i.e., years, decades) may occur between the introduction of an invasive alien species and its detection"
Teyssèdre, Anne	Summary for policymakers	3	3	82	88	this paragraph B3 seems less important than the following B4 and B5 => Move this paragraph further down, after the paragraph on islands ?	Thank you for your suggestion. In the second order draft of the SPM, the text has been changed substantially according to the comments
Teyssèdre, Anne	Summary for policymakers	3	3	82	88	This paragraph B3 seems less important than the following B4 and B5 : Move this paragraph further down, after the paragraph on islands ?	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	3	3	83	84	this sentence does not contribute to the para and could be deleted or moved	Thank you for your suggestion - the text has been changed substantially in the second order draft according to the comments.
Nunes, Ana	Summary for policymakers	3	3	84	85	Not clear what is meant by 'Changes in biological invasions'; do you mean changes caused by biological invasions?	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Government of USA	Summary for policymakers	3	3	86	86	Recommend clarifying the meaning/intent of "overexploitation of wildlife." and/or using a different term. Exploitation has a negative connotation.	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Kamal Kumar Rai	Summary for policymakers	3	3	86	86	land- and sea-use change or overexploitation of wildlife and wild species.	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM and designation of drivers follows the global assessment
Diaz, Sandra	Summary for policymakers	3	3	90	90	replace "impact nature" with "native nature"	Thank you, we have decided not to address this comment, as IAS are considered as drivers in this assessment - adding "native" may raise suspicions and complicate the SPM
Government of Germany	Summary for policymakers	3	3	90	96	General comment: Chp. 6 (L2514-L2516) clearly states that, we quote, "[T]he key message from past research is that restoration of habitat and native communities can limit abundance of invasive alien species substantially, however it cannot control invasive alien species completely (Levine et al., 2004)." This means that the condition of an ecosystem can significantly affect its resilience to invasive species. In other words, a degraded ecosystem could just be the entry point allowing IAS to invade and spread across a landscape. This aspect is critical to the development of management options to control and mitigate invasive species and it should therefore be emphasized what this implies throughout the key messages.	Thank you, this is now included in the second order draft of the SPM
Government of Germany	Summary for policymakers	3	3	90	90	Proposal: The statement "biological invasions impact nature and people in all biomes" seems to be inaccurate/too sweeping. The deep sea is not effected by invasive species (see A2 page 1 "margins of the deep sea"). Please adjust the phrase accordingly.	Thank you, we have corrected the draft for more consistency in the second order draft of the SPM
Government of Norway	Summary for policymakers	3	3	90	96	The bold sentence in this paragraph is very little concrete, the message would be stronger and the main message more clear and easier to implement in policy and management if the sentences on lines 93-96 were used as bold sentence in the paragraph, to highlight which (natural-)systems are most vulnerable and should receive increased policy and management focus.	Thank you, we have reviewed the evidence based on other comments and have redrafted the paragraph accordingly in the second order draft of the SPM
Takahashi, Yasuo	Summary for policymakers	3	3	90	101	Para B4 and B5 can be integrated	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Takahashi, Yasuo	Summary for policymakers	3	3	90	96	Suggest a full rewrite of this paragraph. For example, the lead sentence can be simplified as "The magnitude of the impacts of biological invasion is different in different regions and contexts". I cannot make sense of the sentence "Even when similar habitats are invaded, an invasive alien species can lead to different outcomes depending on the wider context."	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Evans, Thomas	Summary for policymakers	3	3	91	91	How about: Biological invasions occurring in very similar habitats and involving the same alien species can result in very different impacts and outcomes depending on the wider context. Nevertheless, anthropogenically-degraded ecosystems are...	Thank you for your suggestion - the text has been changed substantially according to the comments.
Heger, Tina	Summary for policymakers	3	3	91	92	"an invasive species can lead to..." - please change to "an invasion by the same species can lead to different outcomes depending on..."	Thank you for your suggestion. In the second order draft of the SPM, the text has been changed substantially according to the comments.
Tassin, Jacques	Summary for policymakers	3	3	91	91	That should be more neutral: please replace 'is exacerbed' by 'is exacerbed or attenuated'	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Teyssèdre, Anne	Summary for policymakers	3	3	93	93	Before "Anthropogenically-degraded ecosystems", add this introducing proposal: "Since habitat changes drive the decline of specialist species" ((e.g. Clavel, J. et al. 2011, Front. Ecol. Environ. 9: 222–228 ; Teyssèdre A. & A. Robert, 2014, Oikos 123: 857–865)), [anthropogenically-degraded ecosystem are generally more vulnerable ...].	Thank you for your suggestion - the text has been changed substantially according to the comments in the second order draft of the SPM.

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Teyssèdre, Anne	Summary for policymakers	3	3	93	93	Before “Anthropogenically-degraded ecosystems”, add this introducing proposal: “Since habitat changes drive the decline of specialist species” ((e.g. Clavel, J. et al. 2011, Front. Ecol. Environ. 9: 222–228 ; Teyssèdre A. & A. Robert, 2014, Oikos 123: 857–865)), [anthropogenically-degraded ecosystem are generally more vulnerable ...].	Thank you for your suggestion - the text has been changed substantially according to the comments in the second order draft of the SPM
Eckbo, Norith	Summary for policymakers	3	3	94	96	This sentence seems incomplete and is difficult to grasp the meaning of.	Thank you for your suggestion - the text has been changed substantially in the second order draft according to the comments.
Evans, Thomas	Summary for policymakers	3	3	94	94	As this line starts with 'Even' I'm expecting it to end differently. Could this be: 'Even some remote areas and ecologically sensitive sites that are protected by legislation are now vulnerable to impacts. This is because they are increasingly accessible to humans...'	Thank you for your suggestion - the text has been changed substantially according to the comments in the second order draft of the SPM
Government of Australia	Summary for policymakers	3	3	94	94	Replace "Even..." with "This includes..."	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Government of Belgium	Summary for policymakers	3	3	94	96	There seem to be an issue (missing verb?) with the formulation of the sentence "Even protected areas..."	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Government of Chile (Ministry of the Environment)	Summary for policymakers	3	3	94	96	We suggest to re-draft the phrase. We did not understand it.	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Government of France	Summary for policymakers	3	3	94	96	To improve the syntax we suggest to rephrase the last sentence as follows: "Even protected areas and remote locations that are increasingly accessible to humans - and that consequently show increased levels of anthropogenic disturbance, display an increased number of invasive alien species"	Thank you for your suggestion - the text in the second order draft of the SPM has been changed substantially according to the comments.
Government of Germany	Summary for policymakers	3	3	94	96	Proposal: The sentence seems to be incomplete. Please check. You might also want to reformulate (in bold): "Even protected areas as well as remote locations that are increasingly accessible to humans, and consequently have increased levels of anthropogenic disturbance and increased number of invasive alien species." Reasoning: the qualifier "that are increasingly accessible to humans" seems to refer to "remote places" and not to "protected areas".	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Government of Mexico	Summary for policymakers	3	3	94	96	The phrase seems incomplete. Maybe "are becoming more vulnerable to biological invasions" could be added at the end for clarity.	Thank you for your suggestion - the text has been changed substantially in the second order draft according to the comments.
Government of UK (Sarah Webster, Defra)	Summary for policymakers	3	3	94	96	Not a sentence. Remove the word "that" at line 94	Thank you for your suggestion - the text has been changed substantially in the second order draft according to the comments.
Heger, Tina	Summary for policymakers	3	3	94	96	This sentence is incomplete. I am not sure about its message, hence I have no good suggestion for a reformulation	Thank you for your suggestion - the text has been changed substantially in the second order draft according to the comments.
Nunes, Ana	Summary for policymakers	3	3	94	96	Sentence not clear, should probably not start with the word 'Even'	Thank you for your suggestion - the text has been changed substantially in the second order draft according to the comments.
Teyssèdre, Anne	Summary for policymakers	3	3	94	94	To complete the argument line 93, add this precision : [anthropogenically-degraded ecosystems are generally more vulnerable to biological invasions] “of opportunistic and generalist species, whether they are regional or exotic,” [than ecosystems less affected by human activities]. (e.g. Teyssèdre & Robert 2015, Biodiversity and Conservation 24 (3): 705-706)	Thank you for your suggestion - the second order draft of the SPM has been changed substantially and the concerns raised seem addressed
Teyssèdre, Anne	Summary for policymakers	3	3	94	94	To complete the argument line 93, add this precision : [anthropogenically-degraded ecosystems are generally more vulnerable to biological invasions] “of opportunistic and generalist species, whether they are regional or exotic,” [than ecosystems less affected by human activities]. (e.g. Teyssèdre & Robert 2015, Biodiversity and Conservation 24 (3): 705-706)	Thank you for your suggestion - the second order draft of the SPM has been changed substantially and the concerns raised seem addressed
Evans, Thomas	Summary for policymakers	3	3	96	96	increased number(s)	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Romero, José A.	Summary for policymakers	3	3	96	96	Would it be appropriate to introduce a sentence here to indicate, if the scientific evidence exists, that there are situations where a tipping point has been reached with respect to the presence of invasive aline species and their impact on nature?	Thank you for this comment - we do not have evidence of this.
Brooks, Thomas	Summary for policymakers	3	3	98	101	Key message B5 is a really important one. Perhaps worth adding a further sentence to be clear that this also applies to other "island-like" systems such as lakes.	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Clark, Vincent	Summary for policymakers	3	3	98	99	Change "biome" to terrestrial habitat; islands are not biomes.	Thank you for your suggestion - the text has been changed substantially according to the comments - biomes has been changed to continent in the second order draft of the SPM
Government of Belgium	Summary for policymakers	3	3	98	101	This statement should not be an excuse for policy makers not to manage biological invasions outside islands.	Thank you for your feedback.
Government of France	Summary for policymakers	3	3	98	98	Explain why islands have been disproportionately affected.	Thank you, this is now explained in the background section of the second order draft of the SPM
Government of France	Summary for policymakers	3	3	98	98	Inhabited oceanic islands have been : It is mainly the heavily populated oceanic islands, whose ecosystems have been greatly disturbed by the arrival of humans, that suffer from IAS	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments - this is explained in the background
Government of Mexico (Koleff, Patricia)	Summary for policymakers	3	3	98	99	There is a clear definition of a biome. Islands can be part bur are not "biomes", should say environments/ ecosystems	Thank you, this has been corrected in the second order draft of the SPM
Jactel, Hervé	Summary for policymakers	3	3	98	98	Explain why islands have been disproportionately affected.	Thank you, this is now explained in the background section of the second order draft of the SPM
Sigala, Pierre	Summary for policymakers	3	3	98	98	Inhabited oceanic islands have been : It is mainly the heavily populated oceanic islands, whose ecosystems have been greatly disturbed by the arrival of humans, that suffer from IAS	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments - this is explained in the background
Tassin, Jacques	Summary for policymakers	3	3	98	98	Islands and assimilated closed and isolated biomes (lakes, ponds)	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Bortolus, Alejandro	Summary for policymakers	3	3	99	101	This statement is too short and too poor for a document that needs to be unambiguously clear. I suggest expanding it and explain a bit more.	Thank you, this paragraph has been deleted and the comment is no longer relevant.
Diaz, Sandra	Summary for policymakers	3	3	99	99	I suggest replacing "other biomes" with "continental areas"	Thank you, in the second order draft of the SPM we have revised this following the many comments on this word.
Government of Australia	Summary for policymakers	3	3	99	99	remove supurflous "indeed"	Thank you, we have revised the text accordingly in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Grossart, Hans-Peter	Summary for policymakers	3	3	99	101	Please put into context: islands are hotspots of endemic species (which often have developed in the absence of other species which would occupy a given niche on the mainland) and hence invasive alien species are of major concern.	Thank you, this has been added in the second order draft of the SPM
Nunes, Ana	Summary for policymakers	3	3	99	99	Suggest the addition of 'Indeed islands harbor some of the highest numbers of invasive alien species per surface unit/in relation to their surface'	Thank you, this comment has been taken into account in the second order draft of the SPM
Teyssèdre, Anne	Summary for policymakers	3	3	99	99	Before « Indeed islands harbour [...]”, add an introducing sentence like this: “Due to their former long lasting biogeographic isolation, the dynamics and evolution of insular communities and ecosystems are disrupted by the current huge global increase of trades and displacements..” (e.g.: Gillespie et al, 2008, Molecular Ecology 17, 45-57; Reaser et al., 2007, Environmental Conservation 34(2): 98-11; ...).	Thank you for this comment - we have introduced the mechanisms for this trend throughout include the biogeographic isolation but also the long history of repeated introductions
Teyssèdre, Anne	Summary for policymakers	3	3	99	99	Before « Indeed islands harbour [...]”, add an introducing sentence like this: “Due to their former long lasting biogeographic isolation, the dynamics and evolution of insular communities and ecosystems are disrupted by the current huge global increase of trades and displacements..” (e.g.: Gillespie et al, 2008, Molecular Ecology 17, 45-57; Reaser et al., 2007, Environmental Conservation 34(2): 98-11; ...).	Thank you for this comment - we have introduced the mechanisms for this trend throughout include the biogeographic isolation but also the long history of repeated introductions
Uludag, Ahmet	Summary for policymakers	3	3	99	101	"islands harbor some of the highest numbers of invasive alien species". I think this sentence is vague. It can be correct very large islands but mostly we think smaller ones. Russell, J. C., Meyer, J. Y., Holmes, N. D., & Pagad, S. (2017). Invasive alien species on islands: impacts, distribution, interactions and management. Environmental Conservation, 44(4), 359-370.	Thank you for your suggestion - the text has been changed substantially according to the comments in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	3	3	100	100	Should you use 'native species' rather than 'taxa'?	Thank you, this sentence has been removed from the second order draft of the SPM
Government of France	Summary for policymakers	3	3	100	101	Remind the high level of endemism in islands.	Thank you, this has been addressed accordingly in the second order draft of the SPM
Jactel, Hervé	Summary for policymakers	3	3	100	101	Remind the high level of endemism in islands.	Thank you, this has been addressed accordingly in the second order draft of the SPM
Lieurance, Deah	Summary for policymakers	3	3	100	100	Either delete 'some" entirely or replace with 'endemic' or similar word	Thank you, this paragraph has been deleted and the comment is no longer relevant.
Tassin, Jacques	Summary for policymakers	3	3	100	101	Please complete: '... on islands, and consequently also in tje worplrd, as extinctions mostly occurr on islands	Thank you, this paragraph has been deleted and the comment is no longer relevant.
Government of France	Summary for policymakers	3	3	101	101	on islands apart from anthropogenic destruction of ecosystem : species extinctions are often, if not always, linked to the initial destruction of ecosystems by humans	Thank you for your suggestion - the text has been changed substantially according to the comments - this is explained in the background of the second order draft of the SPM
Sigala, Pierre	Summary for policymakers	3	3	101	101	on islands apart from anthropogenic destruction of ecosystem : species extinctions are often, if not always, linked to the initial destruction of ecosystems by humans	Thank you for your suggestion - the text has been changed substantially according to the comments - this is explained in the background of the second order draft of the SPM
Bharat, Alka	Summary for policymakers	4	4	20	20	Add modification before extinction	Thank you, we have deleted this sentence and the comment is therefore no longer relevant
Bliss, Cebuan	Summary for policymakers	4	4	103	103	Suggest using other wording - threats puts the negative bias on the species themselves. Whilst it is human activities which is the threat exacerbating the spread of IAS	Thank you, we have deleted this sentence from the second order draft of the SPM
Calderón, Isabel	Summary for policymakers	4	4	103	113	Under the WTO SPS Agreement, Members can take measures to prevent or limit other damage within the territory of the Member from the entry, establishment or spread of pests. Other objectives of SPS measures are to protect animal or plant life or health within the territory of the Member from risks arising from the entry, establishment or spread of pests, diseases, disease-carrying organisms or disease-causing organisms or to protect human life or health within the territory of the Member from risks arising from diseases carried by animals, plants or products thereof, or from the entry, establishment or spread of pests. These measures must be notified to other trading partners, and are available through the WTO SPS Information Management System (SPS IMS). www.spsims.wto.org.	SOS Agreement is indeed well covered in the assessment (see Chapter 5)
EL Houdi, Khadija	Summary for policymakers	4	4	103	103	The threats of invasive alien species have gained increasing attention " by whom?scientists? International institutions?Politicians?'it's important to show if there is also a lag between the scientific communauty and the decision makers about this question	Thank you, we have deleted this sentence from the second order draft of the SPM
Government of Belgium	Summary for policymakers	4	4	103	113	This paragraph may be better placed in section C (mangement)	Thank you, we have reworded this paragraph in the second order draft of the SPM to emphasize its focus on inadequate policies and measures leading to biological invasions (as a pattern)
Government of Ireland (Nelson, Brian)	Summary for policymakers	4	4	103	106	The first overarching sentence is unclear. Perhaps it is meant to read "The threats of invasive alien species have gained increasing attention, yet there are gaps and disparities in existing policies within and across governments related to biosecurity, trade, forestry, wildlife exploitation, agriculture, and other sectors that exacerbate the threat from biological invasions."	Thank you, we have deleted this sentence from the second order draft of the SPM
Government of USA	Summary for policymakers	4	4	103	106	Tone of Key Message B6 appears not to support/value the importance of agriculture, trade, and forestry and suggests that reducing or eliminating these sectors is a potential action step.. In reality, these sectors are critical for economic and food security. The specific statement (emphasis added) is "biosecurity, trade, forestry, wildlife exploitation, agriculture, and other sectors ... exacerbate the threat from biological invasions."	Thank you, we have reworded this paragraph accordingly in the second order draft of the SPM
Grossart, Hans-Peter	Summary for policymakers	4	4	103	113	Here I miss a statement that there are big differences between countries and geographical areas. It would be good to state in the document where invasion hotspots are and to which anthropogenic activities they are linked to!	Thank you, the evidence is available in the chapters and throughout the second order draft of the SPM
Lieurance, Deah	Summary for policymakers	4	4	103	113	I think pointing out biocontrol here might hinder future work on classical biocontrol management. I am aware that there are some cases of the agent becoming the invader, but most of those examples happened in the past and new work in this area does everything to screen out future invaders before they're released. Just suggesting some caution here making this point.	Thank you, we have edited the text accordingly in the second order draft of the SPM
Nunes, Ana	Summary for policymakers	4	4	103	106	Biosecurity is not a sector that exacerbates the threat from biological invasions, like the other ones listed. On the contrary, it helps to adress the problem, so this part of the sentence should be rephrased.	Thank you, we have edited the text accordingly in the second order draft of the SPM
Sieffert, Laetitia	Summary for policymakers	4	4	103	103	It is important to highlight a very important sentence in Ch 3 page 9 lines 97-99 "The research, stakeholder and policymaker communities are currently underprepared for addressing and reacting to such emerging driver phenomena". It is crucial to make this very clear to policy makers as resources are sorely needed to attend this gap, without which we will always lag behind biological invasions. This is also somewhat included in D1	Thank you, we have deleted this sentence from the second order draft of the SPM
Takahashi, Yasuo	Summary for policymakers	4	4	103	103	Delete "the threats of invasive alien species have gained increasing attention, yet"	Thank you, we have edited the text accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	4	4	104	105	It is not clear. We don't know what activity it is: forestry, agriculture...? We don't know either if the text speaks about their management or something else. It is too vague.	Thank you, we have reworded this paragraph accordingly in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Germany	Summary for policymakers	4	4	104	104	Proposal: Please include a definition for "biosecurity".	Thank you, this definition is included in the assessment glossary of the second order draft of the SPM
Jactel, Hervé	Summary for policymakers	4	4	104	105	It is not clear. We don't know what activity it is: forestry, agriculture...? We don't know either if the text speaks about their management or something else. It is too vague.	Thank you, we have removed part of this sentence to clarify and reduce overlaps in the second order draft of the SPM
Government of Mexico (Koleff, Patricia)	Summary for policymakers	4	4	105	106	Add: aquaculture	Thank you but following other comments, we have deleted this sentence from the second order draft of the SPM
Brooks, Thomas	Summary for policymakers	4	4	106	106	This key message is a bit too negative as framed. Suggest adding a clause in to start the sentence on Line 106 along the lines of "While well-designed invasive alien species response policies are essential and yield large benefits,...". This would also ensure consistency with the key messages under C.	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	4	4	106	106	It is not clear if the text is talking about differences between countries or not.	Thank you, this has been clarified in the second order draft of the SPM
Heger, Tina	Summary for policymakers	4	4	106	107	Not sure what are scientific capacities; I suggest reformulating this sentence to "There are substantial differences in resources, knowledge an regulatory capacities among states for promoting biosecurity and preventing or managing biological invasions."	Thank you, this has been corrected in the second order draft of the SPM
Jactel, Hervé	Summary for policymakers	4	4	106	106	It is not clear if the text is talking about differences between countries or not.	Thank you, this has been clarified in the second order draft of the SPM
Setsaas, Trine Hay	Summary for policymakers	4	4	107	107	Change "states" to "countries"?	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	4	4	108	108	At B6: change "increase good quality of life" to "improve quality of life"	Thank you, this has been revised accordingly in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	4	4	109	109	Perhaps: 'sustainable exploitation of natural resources'.	Thank you, this sentence has been deleted and the comment is no longer relevant
Furukawa, Takuya	Summary for policymakers	4	4	109	109	"exploitation of natural resources sustainably" sounds contradicting. Do the authors imply that IAS can be introduced even when a natural resource is used sustainably?	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Germany	Summary for policymakers	4	4	109	109	Proposal: Kindly consider whether instead of "exploitation of natural resources sustainably" it could read "sustainable use of natural resources".	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Ireland (Nelson, Brian)	Summary for policymakers	4	4	109	109	suggest that "and sustainable exploitation of natural resources ..." is simpler	Thank you, this has been addressed in the second order draft of the SPM
Government of USA	Summary for policymakers	4	4	109	109	Recommend using a different term to describe "exploitation of natural resources" Exploitation has a negative connotation.	Thank you, this sentence has been deleted from the second order draft and the comment is no longer relevant
Heger, Tina	Summary for policymakers	4	4	109	109	"sustainable exploitation" seems a contradiction in itself; suggestions:"and sustainable use of resources have led to..."	Thank you, this sentence has been deleted and the comment is no longer relevant
Brooks, Thomas	Summary for policymakers	4	4	110	110	"Similarly" is not really appropriate here. Suggest change to "Even" or maybe "Perversely".	Thank you, this sentence has been deleted and the comment is no longer relevant
Evans, Thomas	Summary for policymakers	4	4	110	113	So taking into account the above three comments maybe: 'Similarly, some policies directed at reducing biological invasions (e.g., biocontrol programmes) and other threats to biodiversity (e.g., climate change) have introduced, or increased the risk of introducing and / or spreading, invasive alien species.'	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Canada (Bourchier, Rob)	Summary for policymakers	4	4	110	111	The statement "Similarly, some policies directed at reducing biological invasions (e.g., classical biocontrol programmes) and other threats to biodiversity (e.g., climate change adaptation), have introduced or increased the risk of introducing and spreading, invasive alien species" is misleading. by the use of parentheses. It should be "Similarly, some policies directed at reducing biological invasions and other threats to biodiversity have introduced or increased the risk of introducing and spreading, invasive alien species" Biological control is important tool (Chapter 5) for management of IAS and the implication that all climate change adapation efforts results in increased risk if introducing and spreading IAS is not true.	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Canada (Fraleigh, Brad)	Summary for policymakers	4	4	110	113	Insert "some unregulated" before "classical biocontrol". Background para. 17 is careful to pinpoint which biocontrol programs cause problems. The wording of Para. B.6 tars all biocontrol with the same inaccurate brush.	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Canada (Mason, Peter)	Summary for policymakers	4	4	110	113	The statement, "Similarly, some policies directed at reducing biological invasions (e.g., classical biocontrol programmes) and other threats to biodiversity (e.g., climate change adaptation), have introduced or increased the risk of introducing and spreading, invasive alien species." is incorrect. Classical biological control is not a policy but a management strategy. Furthermore, it has never been a major source of invasive alien species. The phrase, "(e.g., classical biocontrol programmes) " must be deleted. It wrongly suggests to policy makers that classical biological control is bad!!	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of France	Summary for policymakers	4	4	110	113	Concrete examples could allow to clarify this sentence.	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of France	Summary for policymakers	4	4	110	113	Delete the entire sentence Similarlyinvasive alien species. It is paradoxical that biological control, which is poorly implemented, is particularly cited and negatively connoted, while the use of chemicals for control is at least more dangerous for ecosystems.	Thank you, this sentence has been deleted accordingly from the second order draft of the SPM
Government of France	Summary for policymakers	4	4	110	113	or "decreased" the risk... should be more specific otherwise counterintuitive. Suggestion of rephrasing : "other threats to biodiversity (...) have paradoxically introduce or increase the risk of introducing..."	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Germany	Summary for policymakers	4	4	110	113	Clarification needed: Please explain in more detail.	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Ireland (Nelson, Brian)	Summary for policymakers	4	4	110	113	The sentence starting 'Similarly...' could be clearer.	Thank you, this sentence has been deleted and the comment is no longer relevant
Jactel, Hervé	Summary for policymakers	4	4	110	113	or "decreased" the risk... should be more specific otherwise counterintuitive. Suggestion of rephrasing : "other threats to biodiversity (...) have paradoxically introduce or increase the risk of introducing..."	Thank you, this sentence has been deleted and the comment is no longer relevant

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Sigala, Pierre	Summary for policymakers	4	4	110	113	Delete the entire sentence Similarlyinvasive alien species. It is paradoxical that biological control, which is poorly implemented, is particularly cited and negatively connoted, while the use of chemicals for control is at least more dangerous for ecosystems.	Thank you, this sentence has been deleted accordingly from the second order draft of the SPM
Evans, Thomas	Summary for policymakers	4	4	111	112	As I stands this feels like you are stating that climate change adaptation is a threat. It's just the way the sentence has been worded. You could just delete 'adaptation' as the sentence still makes sense.	Thank you, this has been corrected in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	4	4	111	111	Classical? Maybe delete this word?	Thank you, this sentence has been deleted and the comment is no longer relevant
Evans, Thomas	Summary for policymakers	4	4	112	112	Maybe: 'increasing the risk of introducing and / or spreading invasive alien species.'	Thank you, this sentence has been deleted and the comment is no longer relevant
Lang, Iris	Summary for policymakers	4	4	112	112	Remove coma between "spreading" and "invasive species"	Thank you, this has been addressed in the second order draft of the SPM
Kamal Kumar Rai	Summary for policymakers	4	4	113	113	Policy reform is needed to recognise and respect the inclusion of ILK of IPLCs, including women, youth and elders, healers, priests, for collective contribution on gap filling on the policy process. Customary governance systems and ILK inclusion in science and policy is needed. The mechanism for this inclusion is important to specify.	Thank you, this has been included in Chapter 6 of the second order draft of the SPM.
Government of Belgium	Summary for policymakers	5	6	114	163	Maybe interesting to state in section C that budget dedicated to management is currently insufficient to compensate for the increase of the rate of biological invasions and damages they cause. Diagne et al (2021) highlight that damage costs caused by invasions increase at a much faster rate than management costs (InvaCost).	Thank you, the need for investment is now clearly included in the second order draft of the SPM
Government of Canada (Ariey-Jouglaard, Rachel Tu-Van)	Summary for policymakers	5	5	114	115	The way this key message is phrased can lead to confusion. Indeed, there is a reference to prevention (a specific measure to address IAS) and management of IAS (a large category that would include prevention). It may be clearer if it did not include the word "prevented".	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Canada (Bourchier, Rob)	Summary for policymakers	5	5	114	114	The statement - "The observed and potential impacts of invasive alien species can be prevented and addressed through management" should be changed to "The observed and potential impacts of invasive alien species can be addressed through management" The use of the work prevented is confusing because prevention is part of early intervention whereas management activities happen after prevention or eradication has failed.	Thank you, this has been revised in the second order draft of the SPM
Government of Germany	Summary for policymakers	5	5	114	140	Clarification needed: It is indisputable that early measures are useful in the prevention or control of invasive alien species. However, the question arises to what extent these measures and the IPBES definition of Invasive Alien Species (IBBES 2018b) fit together. On what basis are the measures mentioned here to be carried out, if the invasive species must be established according to the definition and have a local impact on the ecosystem or species? Please clarify.	Thank you, we have rephrased this sentence for clarification in the second order draft of the SPM
Government of Germany	Summary for policymakers	5	5	114	115	Proposal: Please add 'partially' before 'be prevented' or exchange the word "prevented" by "reduced", because it cannot be totally prevented- see also our further comments on this issue.	Thank you, we have revised the title to add this point in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	5	5	114	115	C "The observed and potential impacts of invasive alien species can be prevented and addressed through management." seems a bit sweepingly optimistic. It is suggested that this is to qualify that with an "often" or "sometimes" or to modify it to that they can be "prevented or minimised" through management if that does not take away from the need to be upbeat and motivational!	Thank you, in the second order draft of the SPM, we have revised the title to specify that impacts can be prevented OR minimized
Government of Mexico (Saad Alvarado, Laura)	Summary for policymakers	5	5	114	126	I kindly suggest reconsidering the wording of point C because concept/ term "invasive alien species" are repeated 5 times.	Thank you, we have revised the second order draft of the SPM accordingly
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	5	8	114	235	Plant Health and Animal Health provide important models for how the global community could rise to meet the challenge of invasive alien species. However, they are only briefly mentioned here. More detail needs to be provided to compare between these areas - for example successes and failures, available resources, policies and structures.	Thank you, this has been removed, in line with the available evidence and the need to focus more on integrated governance
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	5	6	114	163	This section provides little quantified information about barriers to management, global capacity to respond and successes and failures.	Thank you, the SPM is solution-focused and shows how to implement successful management. In other words, it offers some solutions to overcome the barriers.
Grossart, Hans-Peter	Summary for policymakers	5	5	114	126	Also here, I miss some more precise examples for management measures...	Thank you, we have added a table with more details to the second order draft of the SPM
Grossart, Hans-Peter	Summary for policymakers	5	6	114	163	In this chapter I miss a bit the aspect how systems can be restored to prevent spreading of invasive alien species and how to promote the native species. What is the wished scenario, in particular if invasive alien species cannot be eradicated anymore...?!	Thank you, solutions are emphasized in sections C and D but there isn't a unique solution. It depends on context, species, environment, stage of invasion... etc.
Lang, Iris	Summary for policymakers	5	6	114	163	For "Part C" : it should be pointed that management practices on well-established invasive populations can have unexpected counter-productive effects (e.g. by direct negative impacts of management practices on the ecosystem, or by modifying functional traits of invasive organisms and therefore, modifying their effects on the ecosystem functioning; Zavorka et al 2018, 2020), particularly when eradication is not possible. There are still important gaps of knowledge on this subject. https://esajournals.onlinelibrary.wiley.com/doi/10.1002/fee.1922 https://pubmed.ncbi.nlm.nih.gov/33463893/	Thank you, negative outcomes of management are now included in the second order draft of the SPM
Romero, José A.	Summary for policymakers	5	5	114	115	Being in the context of evaluating actions that policy makers may consider, would it not be appropriate to specify that the actions presented in the SPM address only the negative impacts and write: "The observed and potential negative impacts of invasive alien species can be prevented and addressed through management."	Thank you, we have revised the title accordingly in the second order draft of the SPM
Diaz, Sandra	Summary for policymakers	5	5	116	116	replace "many diverse" with either "diverse" or "many"	Thank you, this has been edited accordingly in the second order draft of the SPM
Government of Canada (Chakravarty, Bipasha)	Summary for policymakers	5	5	116	120	Prevention and early detection are the best strategies for eradication, but at what stage can this be detected and recognized? i.e. what is the tipping point for taking action?	Thank you, this is now developed in this section (see Figure on management continuum for more information)
Government of France	Summary for policymakers	5	5	116	117	OK but add also "early detection"	Thank you, this sentence has been deleted and the comment is no longer relevant
Jactel, Hervé	Summary for policymakers	5	5	116	117	OK but add also "early detection"	Thank you, this sentence has been deleted and the comment is no longer relevant

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Nunes, Ana	Summary for policymakers	5	5	116	126	I would recommend mentioning that it is also essential to take animal welfare into account when undertaking management actions (which also affects public acceptance).	Thank you, ethical considerations have been included in the second other draft of the SPM
Robertson, Peter	Summary for policymakers	5	5	116	126	I would suggest a statement in the summary to say that current management is not dealing with the scale of the problem, all major targets have been missed and most impacts remain unmanaged.	Thank you, this is covered in D
Bliss, Cebuan	Summary for policymakers	5	5	117	119	suggesting adding to this sentence: the most sustainable 'and socially acceptable' approaches	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Australia	Summary for policymakers	5	5	117	117	Replace "sustainable approaches" with "sustainable and cost-effective approaches"	Thank you, this sentence has been deleted and the comment is no longer relevant in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	5	5	117	117	"sustainable" does not seem to be the correct word here. Perhaps "successful" or "cost-effective"	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of France	Summary for policymakers	5	5	117	117	Replace "early intervention" by "early detection and rapid intervention".	Thank you, this sentence has been deleted from the second order draft of the SPM and the comment is no longer relevant
Government of Germany	Summary for policymakers	5	5	117	117	Proposal: Introduced invasive alien species may never get established, due to biological and/or abiotic barriers. Please add "and establishment" after "introduction"	Thank you, we have rephrased this sentence to clarify that it applies to alien species in the second order draft of the SPM
Brooks, Thomas	Summary for policymakers	5	5	118	118	Surely this line should start with "and" not "but".	Thank you, this sentence has been deleted and the comment is no longer relevant
Evans, Thomas	Summary for policymakers	5	5	118	118	eradication(s)	Thank you, we have revised this sentence in the second order draft of the SPM
Government of Chile (Ministry of the Environment)	Summary for policymakers	5	5	118	119	The phrase does not name marine examples. Evangelina Schwindt has done some in Argentina.	Thank you, this is an introductory paragraph to the key messages and authors think it is best not to include examples here.
Government of France	Summary for policymakers	5	5	118	118	Replace "but" by "even if" to stress the importance of a preventive approach rather than a curative one. The eradication of IAS is very difficult and expensive. Successful and cost-effective eradications are quite scarce, and most likely to take place on certain territories (e.g., small islands).	Thank you, this sentence has been deleted from the second order draft and the comment is no longer relevant
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	5	5	119	120	This is rather sweeping and suggests abandoning any attempt to manage impacts after establishment. There can be value in slowing the spread of marine species or in reducing their impacts - 5.5.5 provides the Styela example and while eradication efforts (lines 3460-3464) efforts did not eliminate green crab, they did reduce numbers. Suggest removal from this paragraph as it is covered in lines 139-140.	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Netherlands (Groenewoud, H. E.)	Summary for policymakers	5	5	119	120	"Notably prevention is currently the only effective approach for marine invasive alien species": for many marine IAS this is the case, but there are examples of succesfull rapid elimination responses (e.g. Homarus americanus in the UK). And also examples of non-response, while a marine species migh still have been eliminated (e.g. Didemnum vexillum in NL)	Thank you, this sentence has been deleted and the comment is no longer relevant
Henk, Groenewoud	Summary for policymakers	5	5	119	120	"Notably prevention is currently the only effective approach for marine invasive alien species": for many marine IAS this is the case, but there are examples of succesfull rapid elimination responses (e.g. Homarus americanus in the UK). And also examples of non-response, while a marine species migh still have been eliminated (e.g. Didemnum vexillum in NL)	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	5	5	120	123	This text seems narrow. Restoration should also be able to reduce the impact of an invasive. Societal perspectives should be considered broadly, not just in application of new technologies.	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Germany	Summary for policymakers	5	5	120	120	Clarification needed: How is "resistance" defined, and why is the term put in quotes?	Thank you, this sentence has been deleted for better clarity in the second order draft of the SPM
Government of Germany	Summary for policymakers	5	5	120	121	Proposal: It is suggested to be more precise here (proposed insert in bold): "Ecological restoration of land, freshwater water and marine systems to regain their ecological functionality, can increase the "resilience" of invaded ecosystems...". Please also consider aligning terminology: With regards to the term "inland water" we suggest using freshwater throughout the SPM.	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of UK (Sarah Webster, Defra)	Summary for policymakers	5	5	120	120	C: suggest changing "resistance" to resilience	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of France	Summary for policymakers	5	5	121	122	For what purpose? provide examples...	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Germany	Summary for policymakers	5	5	121	121	Proposal: Consider adding "and prevent the re-establishment of invasive alien species into a restored ecosystem" after "reinvansion"	Thank you, this sentence has been deleted and the comment is no longer relevant
Jactel, Hervé	Summary for policymakers	5	5	121	122	For what purpose? provide examples...	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Canada (Alexander, Steven)	Summary for policymakers	5	5	123	124	You note the need to embrace 'science-based approaches' yet in other places within the assessment and in the sentence that follows you highlight the importance of Indigenous and local communities along with the importance of Indigenous and local knowledge. Accordingly, a more inclusive term that aligns with the overall text might be 'evidence-based approaches.'	Thank you, we have revised the text accordingly in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	5	5	123	124	This sentence should be removed. Science-based approaches are already used. The word "essential" here is prescriptive.	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Germany	Summary for policymakers	5	5	123	124	Proposal: Please provide the "principles of adaptive management" in a footnote or appendix.	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of USA	Summary for policymakers	5	5	123	123	"It is essential to embrace..." is prescriptive. Revise	Thank you, we have removed policy-prescriptive language from the second order draft of the SPM

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Participants of ILK dialogue workshop (Guadalupe Yessenia Hernández Márquez)	Summary for policymakers	5	5	123	124	Section C. 123-124. One proposal is to add to science "and other knowledge systems, such as citizen science and indigenous and local knowledge".	Thank you, this sentence has been deleted and the comment is no longer relevant
Evans, Thomas	Summary for policymakers	5	5	124	125	Again the term local communities - when is a community not local?	Thank you, this term is an IPBES accepted one, defined in the IPBES core glossary
Evans, Thomas	Summary for policymakers	5	5	124	124	including 'with' indigenous?	Thank you, we have revised the text accordingly in the second order draft of the SPM
Government of Germany	Summary for policymakers	5	5	124	126	Proposal: The responsibility of governments should be added, otherwise this sentence could be understood as only stakeholder engagement and indigenous peoples are important for management measures. Please clarify the role of governments in this context.	Thank you, this sentence has been deleted and the comment is no longer relevant
Lieurance, Deah	Summary for policymakers	5	5	124	126	Might be worthwhile to specifically mention including land managers along with indigenous peoples and local communities (this would distinguish their contributions from academic/research ones)	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Australia	Summary for policymakers	5	5	125	125	Replace "successful invasive alien species management" with "successful invasive alien species prevention, eradication or management"	Thank you, management includes prevention and eradication.
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	5	5	125	125	This would be better phrased as stakeholder engagement being critical for successful IAS control.	Thank you, this sentence has been deleted and the comment is no longer relevant
Kamal Kumar Rai	Summary for policymakers	5	5	127	127	This should read "IPLCs and other stakeholders" As Indigenous peoples are rights holders, separate from other stakeholders. ILK observation, experiences, interactions, ideology, values, understandings and cosmology based on indigenous science should have a procedural mechanism to collaborate with science, technology and policy, researchers and others.	Thank you, we have reflected this change throughout the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	5	5	128	134	I find this point unclear. Throughout much of the assessment, there is an emphasis on the important of taking local contexts into account, and the implication here that off-the-shelf tools exist is contrary to that. Suggesting that all 3 approaches are needed is contrary to the emphasis placed on the importance of prevention as the most biodiversity-positive and cost-effective solution	Thank you, in the second order draft of the SPM, we have added the word "adapted" to emphasize that they are not on-fits-all. Added "when possible" to show that not always is possible
Government of Chile (Ministry of the Environment)	Summary for policymakers	5	5	128	134	We suggest describing or be more specific about that the phrase is talking about "invasion scenario" to be able to take a management decision. This could be a step in the process or exclusive in the process.	Thank you, this reference has been deleted for better clarity
Government of France	Summary for policymakers	5	5	128	134	It could be useful to clarify the definition of "prevention", as it can cover monitoring, trade control, etc., which can have important costs (in terms of trade reduction for instance).	Thank you, this has been included in the glossary
Lieurance, Deah	Summary for policymakers	5	5	128	140	Switch C1 and C2...C2 sets up C1. Also C2 could be expanded with a general estimate of what prevention can save economically	Thank you, but authors think frameworks for decision are more important, then prevention is seen as a sub-point.
Government of Germany	Summary for policymakers	5	5	131	131	Proposal: The response of invasive alien species to management is scale dependent, and nowadays multiscale programs are implemented to manage invasive alien species (Pysek, P., Richardson, D.M. 2010. Invasive species, environmental change and management, and health. Annu. Rev. Environ. Resour. 35: 25-55). Please consider adding "in time and space" after "invasive alien species"	Thank you, we have added the multiscale dimensions of IAS to the second order draft of the SPM.
Government of France	Summary for policymakers	5	5	132	132	Including "early detection"	Thank you. Early detection is not prevention (please refer to the assessment glossary)
Jactel, Hervé	Summary for policymakers	5	5	132	132	Including "early detection"	Thank you. Early detection is not prevention (please refer to the assessment glossary)
Government of Germany	Summary for policymakers	5	5	134	134	Proposal: Consider adding "at multiscale levels" after "preventive responses"	Thank you, we have added the multiscale dimensions of IAS to the second order draft of the SPM
Kamal Kumar Rai	Summary for policymakers	5	5	134	134	There needs to be inclusion of IPLCs, including women, youth, elders, healers, herder, priests, ILK and indigenous science on the process of prevention and management or any kinds of decision-making framework and approaches based on customary systems, bio-cultural protocol and culturally appropriate	Thank you, this is further developed in Chapter 6 and Section D of the second order draft of the SPM
Bliss, Cebuan	Summary for policymakers	5	5	136	136	and socially acceptable'	Thank you, this is included in the concept of sustainability in the second order draft of the SPM
EL Houdi, Khadija	Summary for policymakers	5	5	136	136	"Prevention and early intervention are the most cost-effective" It would be helpful if a comparison between the cost of non action and that of prevention and early intervention is made.	Thank you for your comment. This was addressed in chapter 5, see for example Box 5.15 in section 5.5
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	5	5	136	136	"sustainable" does not seem to be the correct word here - "easiest" or "minimizes negative impacts" perhaps.	Thank you. Sustainable is appropriate as it includes environmental, social and economic considerations.
Government of France	Summary for policymakers	5	5	136	136	Replace "early intervention" by "early detection and rapid intervention".	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	5	5	136	140	The C2 message shows a lack of coherence: the bold sentence talks about prevention and early detection while the explanatory part talks about eradication.	Thank you, we have clarified this point in the second order draft of the SPM
Government of Germany	Summary for policymakers	5	5	136	140	Comment: As there are so many optional pathways to introduce IAS in marine environments, it is questionable if the approach to prevent from IAS introduction in marine environments is a feasible approach at all. Please check.	Thank you. The authors have rephrased these lines to avoid excluding alternatives. However, evidence is clear on this, that prevention is by far the most successful tool.
Government of France	Summary for policymakers	5	5	137	137	It is effective in very specific context.	Thank you, agreed.
Government of France	Summary for policymakers	5	5	137	137	Reformulate the end of the sentence: "to avoid the introduction and spread of new invasive alien species" OR "to fight against invasive alien species".	Thank you we have rephrased this statement in the second order draft of the SPM
Government of UK (GB Non- native Species Secretariat)	Summary for policymakers	5	5	137	138	Need to quantify the number of island eradications and note the upward trend in these.	Thank you for this comment - we have altered this section substantially but have increased the number of examples with specific details of this kind.

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Sigala, Pierre	Summary for policymakers	5	5	137	137	It is effective in very specific context.	Thank you, agreed.
Evans, Thomas	Summary for policymakers	5	5	138	138	Are all islands 'isolated'? Some isolated landscapes are invaded, and being isolated is part of the reason they are hard to manage. Maybe 'contained' works here?	Thank you, in the second order draft of the SPM, this has been clarified in the text
Government of France	Summary for policymakers	5	5	138	138	such as small et sparsely populated island	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Germany	Summary for policymakers	5	5	138	138	Proposal: Consider adding ", when the population is still small" after "early stages of invasion"	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Germany	Summary for policymakers	5	5	138	138	Proposal: Consider adding "or when implemented at small rather than at large scale" after "islands". Most of the time, eradication programs are more effective at small rather than at large scale. Examples for the success of many small-scale eradication programs in the terrestrial environment come from Australia, where some populations of the African big headed ant Pheidole megacephala were successfully eradicated in northern Australia (Hoffmann, B. D. 2011. Eradication of populations of an invasive ant in northern Australia: successes, failures and lessons for management. Biodiversity and Conservation, 20: 3267-3278).	Thank you, this has been revised accordingly in the second order draft of the SPM
Sigala, Pierre	Summary for policymakers	5	5	138	138	such as small et sparsely populated island	Thank you, this sentence has been deleted and the comment is no longer relevant
Evans, Thomas	Summary for policymakers	5	5	139	139	Maybe '...to contain or eradicate'	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	5	5	139	140	Even if the techniques that have been used for eradication have not worked, this approach should not be totally abandoned. The message is a bit too radical and could be nuanced. Prevention should be favoured because we do not have a better solution at our disposal, but research should allow us to find effective and sustainable management and eradication solutions.	Thank you, this has been rephrased and clarified accordingly in the second order draft of the SPM
Government of Germany	Summary for policymakers	5	5	139	140	Clarification needed: Have containment measures really failed completely in the past, or is it more the case that these measures need to be complemented by precautionary measures? (not an "either or" but rather a "both" approach to control and manage IAS in marine systems? After all, the key message C4 argues that long-term monitoring and ecological restoration" can help achieve the sustainbilty also of marine environments (L139-L150). Please check.	Thank you, this has been rephrased and clarified in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	5	5	139	140	Also include 'in connected water systems'	Thank you for your comment. It was added to the text in the second order draft of the SPM
Nunes, Ana	Summary for policymakers	5	5	139	140	Prevention is also the most effective strategy in other environments, not just the marine. As it is written now, it's misleading.	Thank you, we have rephrased to clarify that it is especially important in marine areas
Uludag, Ahmet	Summary for policymakers	5	5	139	141	I think it is not only for marine environment. Insects create similar problem.	Thank you, in the second order draft of the SPM, we have rephrased to clarify that it is especially important in marine areas
Government of USA	Summary for policymakers	5	5	140	140	This makes it sound as though it's only the most effective in marine environments. Can something about terrestrial be added here as well?	Thank you. In the second order draft of the SPM, we have rephrased to clarify that it is especially important in marine areas
EL Houdi, Khadija	Summary for policymakers	5	5	142	142	"Innovative new technologies are becoming available for pathway management" are those new technologies within the reach of all countries? Should be commented!	Yes. Authors have added this dimension to the second order draft of the SPM
Government of Australia	Summary for policymakers	5	5	142	142	Replace "new technologies" with "new technologies and approaches"	Thank you, but this message is about technologies, not approaches.
Government of France	Summary for policymakers	5	5	142	142	Provide examples of new technologies because it can represent a multitude of objects. The message would be stronger if it was illustrated by examples of innovative new technologies, e.g. remote sensing, meta-barcoding and e-DNA, Artificial Intelligence etc.	Thank you, examples are available in the chapter (please follow the traceability statement in curly brackets) of the second order draft of the SPM
Government of Germany	Summary for policymakers	5	5	142	142	Proposal: Please consider adding "Research and" before "Innovative new technologies".	Thank you for this suggested change, we have adopted it in the second order draft of the SPM
Jactel, Hervé	Summary for policymakers	5	5	142	142	Provide examples of new technologies because it can represent a multitude of objects. The message would be stronger if it was illustrated by examples of innovative new technologies, e.g. remote sensing, meta-barcoding and e-DNA, Artificial Intelligence etc.	Thank you, examples are available in the chapter (please follow the traceability statement in curly brackets)
Taki, Hisatomo	Summary for policymakers	5	5	143	144	Are the meanings of "local to landscape level management" and s"ite/ecosystem-based management" same? If so, one of them might be deleted, according to page5 lines 132-133.	Thank you, this has been clarified in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	5	5	144	147	Why are social, risk/benefit analyses, etc placed here under chapeau text on new technologies? These considerations apply more broadly to any management action (eg in point C4 156-157 below). Perhaps the bold and non-bold sentences should be interchanged?	Thank you, we have included them under this paragraph because they are particularly socially sensitive.
Heger, Tina	Summary for policymakers	5	5	144	145	this first part of the sentence is incomplete; maybe add "is needed"?	Thank you, this has been revised in the second order draft of the SPM
Government of Germany	Summary for policymakers	5	5	145	145	Proposal: Please substitute semicolon with comma after "secondary impacts".	Thank you, we have replaced this by a full stop in the second order draft of the SPM
Government of Australia	Summary for policymakers	5	5	146	146	add something about "abeit, in a timely manner" to this sentence concept.	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Australia	Summary for policymakers	5	5	147	147	Add " In various countries engaging people from all walks of life in surveillance activities are making a valuable contribution to early detection and understanding IAS spread (called general surveillance) and there is scope to extend it wider. However, it is important to understand when general surveillance is appropriate and how to implement it well"	Thank you for this comment - citizen is mentioned but also other mechanisms to achieve surveillance.
Kamal Kumar Rai	Summary for policymakers	5	5	147	147	New and emerging technologies can introduce risks, challenges on Nature, ecosystems, lands, waters, territories and resources of IPLCs that may create different kinds of crisis on Mother Nature that bring adverse effects to IPLCs, women, youth and to ILK. The regulatory and precautionary mechanism of self-determination of indigenous peoples, Free, Prior and Informed Consent, full and effective participation at all level, and socio-economic and cultural impacts assessment are required.	Thank you, this is now mentioned in a general manner (not only for new and emerging technologies) in the second order draft of the SPM
Government of Belgium	Summary for policymakers	5	5	149	157	Section C4 should ideally be placed after C5 (i.e. first management and afterwards monitoring and restoration)	Thank you, agreed.
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	5	5	149	150	The sustainability of management options is not the goal. Monitoring and restoration can help to maintain desirable outcomes.	Thank you, this has been clarified in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of France	Summary for policymakers	5	5	149	150	The bold message might stress the need to monitor over the long term, even after the presumed eradication and restoration, in order to avoid a possible re-invasion.	Thank you, but authors prefer to have short bolded statements
Government of France	Summary for policymakers	5	5	149	157	This paragraph is too broad and vague. An example would be useful to illustrate this.	Thank you, more details are available in the background and examples are in the chapters
Government of Germany	Summary for policymakers	5	5	149	157	Proposal: Long-term monitoring is essential to evaluate the potential negative effects of invasive alien species management on native biodiversity and ecosystem functioning too. In fact, while invasive alien species management may achieve invasive alien species' eradication or minimize their impacts, it may come along with cost for the native biodiversity and ecosystem functioning. Native species and ecosystem functioning may be negatively affected by invasive species management too (Invasive species in forests and rangelands of the United States. 2021. Editors: Poland, T. M., Patel-Weynand, T., Finch, D. M., Ford Miniat, C., Hayes, D. C., Lopey, V. M. Springer). Please consider adding that monitoring may help to track the negative effects of invasive alien species monitoring too.	Thank you, this issue is covered in "improving management outcomes"
Government of Germany	Summary for policymakers	5	5	149	149	Proposal: Please consider adding "standardized" before "monitoring".	Thank you, this wouldn't be consistent with the assessed evidence
Government of Germany	Summary for policymakers	5	5	150	151	Proposal: Please consider adding "Pre- and post-" before " "monitoring programs".	Thank you, authors think this would make the sentence more complicated and do not add value to the statement
Government of Ireland (Nelson, Brian)	Summary for policymakers	5	5	150	152	This sentence is not clear. Is this what is meant? "Monitoring programs are more effective if they include good, robust design and have well developed partnerships and resourcing."	Thank you, this sentence has been revised accordingly in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	5	5	151	151	well and developed? Should this be 'well developed'?	Thank you, this sentence has been revised accordingly in the second order draft of the SPM
Government of Chile (Ministry of the Environment)	Summary for policymakers	5	5	151	151	We suggest to re-draft the phrase. We did not understand it.	Thank you, this sentence has been revised accordingly in the second order draft of the SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	5	5	151	151	C4: change "well and developed" to well developed	Thank you, this sentence has been revised accordingly in the second order draft of the SPM
Government of Chile (Ministry of the Environment)	Summary for policymakers	5	5	152	152	We suggest adding "ensure resources" or "ensure budget"	Thank you, this is covered in other key messages
Government of France	Summary for policymakers	5	5	152	152	Add at the end of the sentence: "and must be continued over time, even after restoration."	Thank you for this comment - this section has been edited substantially in the second order draft of the SPM
Government of France	Summary for policymakers	5	5	152	153	New ecosystem management can also help to increase resistance to invasion (not only reinvasion). It is also important to improve ecosystem resilience to invasions. Improving biodiversity is one option.	Thank you for this comment - we have added further text on ecosystem resilience and also restoration.
Government of Germany	Summary for policymakers	5	5	152	153	Clarification needed: Two issues related to "Restoration plans (...) can increase the "resistance" of the invaded Ecosystem to reinvasion." 1 - question: Why is the word "resistance" written in quotation marks [also in line 120]? 2 - suggestion, please add: "Restoration plans and measures" (not only plans, as plans alone won't change anything).	Thank you, in the second order draft of the SPM, this sentence has been significantly edited in response to this comment .
Government of Germany	Summary for policymakers	5	5	152	152	Proposal: Please consider adding "and consider temporal and spatial scales" after "resourcing".	Thank you, this sentence has been significantly edited in response to other comments, and this comment is no longer relevant
Jactel, Hervé	Summary for policymakers	5	5	152	153	New ecosystem management can also help to increase resistance to invasion (not only reinvasion). It is also important to improve ecosystem resilience to invasions. Improving biodiversity is one option.	Thank you for this comment - we have added further text on ecosystem resilience and also restoration.
Government of Germany	Summary for policymakers	5	5	153	153	Clarification needed: It is unclear what is meant by reinvasion?. Renewed invasion by the same species or by other invasive species? Please provide a definition.	Thank you, this sentence has been deleted for better clarity in the second order draft of the SPM
Kamal Kumar Rai	Summary for policymakers	5	5	157	157	Recognition of the role of ILK, and full and effective participation of IPLCs, including women and youth, on policy, decision-making process and program activities related to restoration, monitoring, evaluation and reporting are all essential. Also, collaboration, principles and mechanisms of Free, Prior and Informed Consent, Environment Impact Assessment (EIA), socio-economic and cultural impact assessment before programme design and implementation are all key and should be highlighted.	Thank you, experts agree with the reviewer and these issues are covered in the assessment
Nunes, Ana	Summary for policymakers	5	5	159	159	Not entirely clear what is meant by evidence-based management programs. You mean measures/techniques for which there is evidence that they have proven effective, or cost-effective, in managing species?	Thank you, this has been deleted and the comment is no longer relevant
Curd, Amélia	Summary for policymakers	6	6	79	80	with notable exceptions...shellfish farming, with the voluntary introduction of the Pacific cupped oyster, <i>Magallana gigas</i> , in France, is considered responsible for ~50% of marine alien species in Europe.	Thank you for this suggestion - this is discussed in the chapters but is captured at a high level in the SPM with the statement "Whilst many invasive alien species have historically been intentionally introduced for their benefits, many introductions have been unintentional, this is the case for most marine species but is also the case in other aquatic and terrestrial systems"
Stiger-Pouvreau, Valérie	Summary for policymakers	6	6	79	80	with notable exceptions...shellfish farming, with the voluntary introduction of the Pacific cupped oyster, <i>Magallana gigas</i> , in France, is considered responsible for ~50% of marine alien species in Europe.	Thank you for this suggestion - this is discussed in the chapters but is captured at a high level in the SPM with the statement "Whilst many invasive alien species have historically been intentionally introduced for their benefits, many introductions have been unintentional, this is the case for most marine species but is also the case in other aquatic and terrestrial systems"
Brooks, Thomas	Summary for policymakers	6	6	159	159	Add "eradication and" before "management programmes". Both are fundamentally important, and the text in key message C5 applies to both.	Thank you, this is covered in other key messages of the second order draft of the SPM
Evans, Thomas	Summary for policymakers	6	6	159	163	C5. All the other points to this and other sections end with bold as a full stop. Maybe: In bold... Evidence-based management programs optimize invasive alien species management outcomes. Not in bold. These programs have the greatest benefits for nature, nature's contribution to people, good quality of life and the economy when they are built on science-based approaches and the principles of adaptive management and strong stakeholder engagement, including indigenous and local knowledge.	Thank you, we have edited the text in line with this comment in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Argentina	Summary for policymakers	6	6	159	163	We suggest to mention sustainable development as a whole at the end of this paragraph. Evidence based management programs should be oriented to generate benefits for sustainable development as a whole.	Thank you, this has been deleted and the comment is no longer relevant
Government of Belgium	Summary for policymakers	6	6	159	163	Important to stress here also the need for partnership and availability of resources on the long term	Thank you, this is covered in other key messages
Government of Canada (Alexander, Steven)	Summary for policymakers	6	6	159	160	There is some inconsistency with the language here referring to evidence-based management followed by science-based approaches? Why differentiate - it suggests a hierarchy of knowledge and doesn't seem consistent with the broader language within the assessment. Perhaps instead: "Management programs built on evidence-based approaches and the principles of adaptive management....."	Thank you, this has been deleted and the comment is no longer relevant
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	6	6	159	163	This point is a strong one, and it could perhaps be promoted. The key messages of C could be reorganized in a simpler progression: 1) IAS can be managed and tools exist for 3 approaches. New tools are also becoming available. 2) prevention is best but eradication can also work in some circumstances, management efforts post-establishment can reduce but not eliminate impacts 3) adaptive management and social engagement lead to the best biodiversity (and social?) outcomes 4) monitoring is needed for adaptive management	Thank you, this has been deleted and the comment is no longer relevant
Kamal Kumar Rai	Summary for policymakers	6	6	163	163	Inclusion of ILK, and customary systems for the engagement of IPLCs are important to highlight	Thank you, this has been included in the second order draft of the SPM
Curd, Amélia	Summary for policymakers	7	7	108	110	is there room for an example of which "quality of life" policies have led to increased invasions? Otherwise this sentence sounds rather vague.	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of France	Summary for policymakers	7	7	108	110	is there room for an example of which "quality of life" policies have led to increased invasions? Otherwise this sentence sounds rather vague.	Thank you, this sentence has been deleted and the comment is no longer relevant
Dommanget, Fanny	Summary for policymakers	7	8	164	235	Overall, section D (as the rest of the document) presents a very pessimistic view of the issue of invasive alien species. There is a potential to highlight what does work in terms of responses and policies, and the concrete actions that are available to decision-makers and stakeholders. E.g., put forward in key messages or in the statements in bold in the paragraphs of the background information what targeted measures are efficient to control some invasion pathways. For instance, having the BMW convention established is an important achievement regarding international coordination.	Thank you, we have revised the section to be more solution-focused in the second order draft of the SPM
Government of Australia	Summary for policymakers	7	8	164	235	Section D is good; nothing significant to report	Thank you for your feedback.
Government of Canada (Ariey-Jouglaard, Rachel Tu-Van)	Summary for policymakers	7	7	164	176	Information on the implementation of national strategies would be important. National strategies do not mean, on their own, that governance will be integrated or implemented. Similarly, the key message should probably include a more action-oriented word, such as "implementation of integrated governance..." to make it more relevant.	Thank you, the introduction has been revised accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	7	8	164	235	Overall, section D (as the rest of the document) presents a very pessimistic view of the issue of invasive alien species. There is a potential to highlight what does work in terms of responses and policies, and the concrete actions that are available to decision-makers and stakeholders. E.g., put forward in key messages or in the statements in bold in the paragraphs of the background information what targeted measures are efficient to control some invasion pathways. For instance, having the BMW convention established is an important achievement regarding international coordination.	Thank you, we have revised the section to be more solution-focused in the second order draft of the SPM
Government of Netherlands (Kreiken, Bob)	Summary for policymakers	7	7	164	164	References to CITES in SPM and the role of illegal wildlife trade in the introduction of invasive alien species would be very helpful for highlighting the importance of integrated global governance.	Thank you. CITES has been mentioned, but the role of illegal wildlife trade is too detailed for the second order draft of the SPM
Grossart, Hans-Peter	Summary for policymakers	7	8	164	235	Here I miss a statement that there are big differences between countries and geographical areas. It would be good to state in the document where invasion hot spots are and to which anthropogenic activities they are linked to!	Thank you, this is covered in section B
Participants of ILK dialogue workshop (Katie Kamelamelala)	Summary for policymakers	7	7	164	164	SPM D: For policymakers, these are all good points in the SPM but an additional point would be community compensation - not just financial support for management, but also financial support to be able to be fully involved in decision processes while not also having to support or compromise their family's wellbeing. Implementation without appropriate budget makes it difficult for IPLC to engage.	Thank you, this has now been included in the second order draft of the SPM
Participants of ILK dialogue workshop (Q"apaj Conde)	Summary for policymakers	7	7	164	164	SPM D: I welcome the CARE principle related to ILK and databases. The assessment could also quote Article 31 from the UNDRIP. It includes controlling, protecting and ILK, but also intellectual property, which is key to IPLC control over their knowledge.	Thank you, this is too detailed for the SPM but has been properly included in Chapter 6 of the second order draft
Participants of ILK dialogue workshop (Te Tui Shortland)	Summary for policymakers	7	7	164	164	SPM D: In terms of data management we also have issues in the Pacific region around technological transfer to IPLC communities, such as the use of AI etc for monitoring and restoration.	Thank you, this level of detail is considered too high for inclusion in the second order draft of the SPM
Calderón, Isabel	Summary for policymakers	7	7	166	176	The WTO SPS Committee serves as a forum for Members to discuss trade-related issues on sanitary and phytosanitary measures. The Committee has been used to hold discussions on how to tackle issues related to invasive species. The thematic session on fall armyworm held in 2019 can serve as an example: https://www.wto.org/english/tratop_e/sps_e/workshop19032019_e.htm .	Thank you but we are not including detailed case studies in the second order draft of the SPM
EL Houdi, Khadija	Summary for policymakers	7	7	166	167	"There has been limited progress in collaboratively addressing biological invasions and in meeting internationally agreed targets and goals." Here the failure of some international agreements to fulfill those goals and targets should be highlighted!	Thank you but the introduction has been revised to be more general (and not a summary of the section)
Kamigawara, Kenji	Summary for policymakers	7	8	166	235	The keyword, 'shared but differentiated responsibility', should be inserted in this part.	Thank you, this is included in the background - but not in the key messages
Government of Chile (Ministry of the Environment)	Summary for policymakers	7	7	167	167	We suggest replacing "meeting" by "reaching". This help to clarify the message.	Thank you but the introduction has been revised to be more general (and not a summary of the section) in the second order draft of the SPM
Lang, Iris	Summary for policymakers	7	7	167	167	National and local scale actions	Thank you, this has been addressed in the second order draft of the SPM.
Uludag, Ahmet	Summary for policymakers	7	7	167	167	actions instead of action.	Thank you, we have corrected this in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	7	7	168	168	ensure	Thank you, this sentence has been revised, and the comment is no longer relevant

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Argentina	Summary for policymakers	7	7	168	169	There should be caution regarding the affirmation that "biological invasions are a global threat". There might be some cases in which some biological invasions are a global threat, but in most cases, from our perspective, the threat may be local, regional, or binational in nature. Therefore, we suggest to rephrase this expression as follows: "given that biological invasion may be a threat that affects more than one country".	Thank you, this paragraph has been entirely revised in the second order draft of the SPM and the comment is no longer relevant
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	7	7	169	171	This needs to be placed in the context of the findings from GABES - namely that transformative change is the only policy option to biodiversity loss.	Thank you, we leave this to the upcoming assessment on transformative change
Government of Germany	Summary for policymakers	7	7	169	169	Clarification needed: please briefly explain the terms "integrated governance and inclusive governance".	Thank you, integrated governance is defined in the glossary. Inclusive governance is no longer used in the second order draft of the SPM
Eckbo, Norith	Summary for policymakers	7	7	171	173	This sentence is hard to grasp the full meaning of, without anymore context and may lead to misunderstandings. Consider rewording to a more precise meaning.	Thank you, this paragraph has been entirely revised and the comment is no longer relevant
Government of UK (Mortimer, Diana)	Summary for policymakers	7	7	171	171	transformative change is wider than this - perhaps add a qualifier of 'to IAS' after transformative change	Thank you, this paragraph has been entirely revised and the comment is no longer relevant
Evans, Thomas	Summary for policymakers	7	7	173	173	I'm not sure what 'but also responding to multiple drivers of global change' means here? It feels like it's been tacked onto the end of this sentence.	Thank you, this paragraph has been entirely revised and the comment is no longer relevant
Government of Canada (Fraleigh, Brad)	Summary for policymakers	7	7	173	173	Insert "and poverty alleviation" after "economic gain" because profits are far from the only reason for economic activities. Eradicating poverty is a principal SDG.	Thank you, this paragraph has been entirely revised and the comment is no longer relevant
Evans, Thomas	Summary for policymakers	7	7	174	174	will lead to improved understanding	Thank you, this paragraph has been entirely revised and the comment is no longer relevant
Government of Canada (Alexander, Steven)	Summary for policymakers	7	7	174	176	This is a critically important point but seems out of place where the focus is on governance and management as this speaks more to the approaches for research and monitoring that will be required to inform governance and management. Alternatively, it is just a matter of flipping the sentence - "Increased effectiveness of evidence-based decision-making will benefit from multidisciplinary approaches that advance our understanding of invasive alien species across environmental, social, and economic systems."	Thank you, this paragraph has been entirely revised and the comment is no longer relevant
Bharat, Alka	Summary for policymakers	7	7	176	176	Add: Mechanism for Transboundary co-operation , like resource rich triangle of Vietnam-Laos-Cambodia	Thank you but this is an introductory paragraph and has been revised to be more general
Kamal Kumar Rai	Summary for policymakers	7	7	176	176	It is important to recognise and highlight indigenous customary governing systems, self-determination and inclusion of IPLCs in the multidisciplinary approach to integration. Process and mechanisms of ILK governance system need to be reflected in the procedural mandate. National, local and provincial policies should recognise IPLCs and legally guarantee their full and effective participation, including providing a participation mechanism. They should also recognise traditional territories including lands, water, ecosystem, landscape, and their customary governance systems.	Thank you, we have addressed this point in the second order draft of the SPM
Government of Canada (Ariey-Jouglaard, Rachel Tu-Van)	Summary for policymakers	7	7	178	185	Capacity is indeed an important issue when it comes to IAS (both in terms of people and resources - Chapter 6 indicated the lack of data on funding support for IAS). The paragraph following this statement should touch on capacity. At the moment it is disconnected from that statement.	Thank you for your comment - we have increased additional text on capacity and resourcing in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	7	7	178	185	is the statement in bold different from the observation in A2 that numbers of alien species and IAS are rising? Suggest that this point be framed as an opportunity to address gaps in capacity, coordination and information sharing to improve IAS management. Statements of importance are not very helpful in decision-making - it is preferable to focus on what can be gained if certain actions are undertaken.	Thank you for your comment - we have increased mention of solutions throughout.
Government of Chile (Ministry of the Environment)	Summary for policymakers	7	7	178	185	The Aichi target 9 has not been reached. We suggest declaring that, due to the first period of Aichi targets already ended, and the SDG also show tendency to not be achieved.	Thank you, this is mentioned in the background
Government of France	Summary for policymakers	7	7	178	183	Suggest switching the title of D1 to the sentence lines 181-183 "Comprehensive multi-scale...". Suggest changing end of sentence which currently reads as "are very important" to "are essential".	Thank you but we may not use policy prescriptive language
Government of Germany	Summary for policymakers	7	7	178	185	Proposal to be more explicit whilst discussing the Aichi biodiversity targets and the relevant SDG, and to update the information provided on these international agreements in this para: - The Aichi Biodiversity Targets are to be replaced by the Post-2020 Global Biodiversity Framework, which should be available in the second half of 2022. It is therefore crucial to update information on how the IPBES IAS assessment can support the implementation of this new global CBD framework in the SPM SOD. - SDG target 15.8 aims to "introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species" by 2020. We are now in the year 2022. As the SDGs continue to be relevant until 2030, it would be useful if you could update your arguments on how these key messages could further support the implementation of the SDGs beyond 2020.	Thank you, the targets are introduced in Chapter 1 and 6, and they have been removed from this paragraph following other reviewers' recommendation
Curd, Amélia	Summary for policymakers	7	7	181	183	Highlight what the solutions are, to create a better dynamic in the SPM and encourage decision-makers and stakeholders to take action. Here, what is key is "Comprehensive multiscale governance [...] are very important." That should be the key message in bold in D1.	Thank you for your comment - we have increased mention of solutions throughout the second order draft of the SPM
Government of France	Summary for policymakers	7	7	181	181	Degradation should be added in this list of drivers.	Thank you, land-use change and biodiversity loss are included as drivers, hoping this addresses your concerns.
Government of France	Summary for policymakers	7	7	181	183	Highlight what the solutions are, to create a better dynamic in the SPM and encourage decision-makers and stakeholders to take action. Here, what is key is "Comprehensive multiscale governance [...] are very important." That should be the key message in bold in D1.	Thank you - we have increased mention of solutions throughout the second order draft of the SPM
Government of USA	Summary for policymakers	7	7	181	181	Recommend using a different term to describe "exploitation of natural resources" Exploitation has a negative connotation.	Thank you, we have aligned with the terminology from the global assessment
Jactel, Hervé	Summary for policymakers	7	7	181	181	Degradation should be added in this list of drivers.	Thank you, land-use change and biodiversity loss are included as drivers, hoping this addresses your concerns.

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Canada (Chakravarty, Bipasha)	Summary for policymakers	7	7	183	185	Governments across the globe have different approaches to deal and enforce legislations to control IAS but these have to be coordinated to show tangible results. Increasing resources to joint global bodies could improve coordination	Thank you, the need for investment is now clearly included in the second order draft of the SPM
Government of UK (Mortimer, Diana)	Summary for policymakers	7	7	183	183	after ' are very important' add 'to prevention and management' to help the reader.	Thank you, prevention is included in management (kindly see the glossary)
Government of Germany	Summary for policymakers	7	7	184	184	Clarification needed: "limited progress" - Has there actually been any global progress on IAS so far? If so, this should be specified. If not, please be more precise here or to add the impacts of such a rate.	Thank you, more information have been added in the second order draft of the SPM
EL Houdi, Khadija	Summary for policymakers	7	7	185	186	"in meeting collaboratively agreed international objectives (Aichi Biodiversity Targets and Sustainable Development Goals)". Are those the only agreements concerned with invasive species? Nagoya and others?	Thank you, Yes, please refer to chapter 6 for more information.
Evans, Thomas	Summary for policymakers	7	7	185	185	Do you need to state where the targets and goals come from here? This is the first time they are mentioned in this summary...	Thank you, these are better introduced in Chapter 1 and 6.
Kamal Kumar Rai	Summary for policymakers	7	7	186	186	It is very important that such national policy and regulatory process must respect the international standards for human rights of indigenous peoples, ensuring Free, Prior and Informed Consent, full and effective participation of IPLCs, including women and youth, collective rights and self-determination of indigenous peoples. Recall the CBD Article 8(j), provisions.	Thank you, this is mentioned in the second order draft of the SPM
EL Houdi, Khadija	Summary for policymakers	7	7	187	188	"Faced with trade-offs between invasive alien species prevention, management, or eradication and competing priorities such as poverty eradication and economic gain,	Thank you, the sentence has been deleted and the comment is no longer relevant
Evans, Thomas	Summary for policymakers	7	7	187	192	This is quite a long sentence. Maybe reduce it to: 'Faced with trade-offs between the management of invasive alien species and other interests such as economic developmnt and public opinion, policymakers could take into account the long-term costs of an alien species on the economy, good quality of life, biodiversity and nature's contributions to people. They should also consider the possibility...'	Thank you, we have deleted this paragraph and the comment is no longer relevant
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	7	7	187	194	It would be helpful to frame this more positively: IAS management efforts can be cost-effective and complementary to actions on other priorities. Because IAS impacts may not be immediately apparent yet they persist for the long term, strategic thinking is needed to assess trade-offs.	Thank you, the sentence has been deleted from the second order draft of the SPM, and the comment is no longer relevant
Government of France	Summary for policymakers	7	7	187	192	This sentence could be shortened and made clearer.	Thank you for your suggestion - the text has been changed substantially in the second order draft according to the comments.
Government of France	Summary for policymakers	7	7	187	187	We cannot really refer to a "trade-off", but rather as a "prevalence" of economic gains over the fight against invasive alien species.	Thank you, we have deleted this paragraph and the comment is no longer relevant
Government of Germany	Summary for policymakers	7	7	187	194	Proposal: The ratio between key message and explanatory text seems odd. Please consider revising and shortening the text in bold.	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Japan (Takehara, Mari)	Summary for policymakers	7	7	187	194	The point raised in the executive summary of Chapter 5 that "prevention and early intervention, where possible, are generally cost-effective and sustainable in the long-term" is important for encouraging policy makers to acquire necessary budgets and implement measures against invasive alien species. However, such description is weak in the SPM because it simply describes the necessity to take into account the long-term vision in D2 and paragraph 30. Therefore it would be desirable if the description of the importance of prevention and early intervention to be included in the SPM.	Thank you, we have deleted this paragraph and the comment is no longer relevant
Government of Mexico (Koleff, Patricia)	Summary for policymakers	7	7	187	194	Need to consider to promote research and development of technologies to use native species, to substitute those IAS that are used/promoted in economic activities that are important for communities. It is not clear what is meant by invasive alien species governance.	Thank you for your comment - we have increased mention of solutions throughout the second order draft of the SPM
Government of Mexico	Summary for policymakers	7	7	187	192	The text in bold seems too long for a key message. It could be divided in two phrases keeping only in bold the first phrase: "Faced with trade-offs between invasive alien species and competing priorities, the long-term costs should be considered", or the whole phrase could be replaced by: "Long-term impacts should be considered when facing trade-offs between invasive alien species and competing priorities.", and provide the details in the Background section.	Thank you, we have deleted this paragraph and the comment is no longer relevant
Government of USA	Summary for policymakers	7	7	187	192	D2. run on sentence - change to "Policymakers are faced with trade-offs between invasive alien species prevention, management, or eradication and competing priorities such as economic gain, responding to other environmental changes, or public opinion. They should consider accounting for the long-term costs of economic impacts and impacts on good quality of life, biodiversity, and nature's contributions, and also consider the possibility that these priorities are complementary and not mutually exclusive."	Thank you, the sentence has been deleted and the comment is no longer relevant
Setsaas, Trine Hay	Summary for policymakers	7	7	187	192	Important message, but sentence should be simplified so the reader can more easily capture this. Perhaps divided. And could perhaps only write "invasive alien species management"?	Thank you, the sentence has been deleted and the comment is no longer relevant
Government of Canada (Fraleigh, Brad)	Summary for policymakers	7	7	188	188	Delete "competing", because the end of the paragraph points out that these priorities can be complementary. Insert "and poverty alleviation" after "economic gain" because profits are far from the only reason for economic activities. Eradicating poverty is a principal SDG.	Thank you, we have deleted this paragraph and the comment is no longer relevant
Diaz, Sandra	Summary for policymakers	7	7	189	191	The following sentence seems to have something gramatically wrong "...policymakers could take into account the long-189 term costs of economic impacts and impacts on good quality of life, biodiversity, and 190 nature's contributions, and also...". I suggest keeping exactly the same meaning with the more straightforward "policymakers could take into account the long-term costs and impacts on good quality of life, nature, and nature's contributions, and also..."	Thank you, the sentence has been deleted and the comment is no longer relevant
Government of Australia	Summary for policymakers	7	7	189	189	consider replacing 'could' with 'should'	Thank you, but we may not be policy prescriptive
EL Houdi, Khadija	Summary for policymakers	7	7	190	190	costs of economic impacts and impacts on, well-being , good quality of life,...	Thank you for your comment. In the IPBES conceptual framework, "well-being" is included under the concept of good quality of life.
Government of Chile (Ministry of the Environment)	Summary for policymakers	7	7	190	190	Chile also has some examples in economic value of invasive species management that can be included: https://especies-exoticas.mma.gob.cl/wp-content/uploads/2018/12/1.-LIBRO-Valoracion-economica-EEI-FINAL.pdf	Thank you, this example has been communicated to the relevant chapter team in the second order draft of the SPM
Lieurance, Deah	Summary for policymakers	7	7	190	190	Remove 'good'...this is an unsequential word and a bit redundnat	Thank you, but we follow the terminology from the IPBES conceptual framework

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Canada (Alexander, Steven)	Summary for policymakers	7	7	191	191	I believe it should read "nature's contributions to people"	Thank you, we agree
Bortolus, Alejandro	Summary for policymakers	7	7	192	194	This statement seems too short, vague and meaningless.	Thank you, this paragraph has been revised accordingly in the second order draft of the SPM.
Government of Australia	Summary for policymakers	7	7	193	194	consider altering the passive language to eg. "Parties are encourage to develop long-term strategic thinking and investments concerning invasive alien species governance to prevent future biological invasions	Thank you, the sentence has been deleted and the comment is no longer relevant
Government of Chile (Ministry of the Environment)	Summary for policymakers	7	7	193	193	We suggest replacing "strategic thinking" by "strategies"	Thank you for your comment - the text has changed substantially in the second order draft of the SPM
Government of Germany	Summary for policymakers	7	7	193	194	Proposal: please replace "prevent" by "reduce the risk of" (see earlier comments).	Thank you, but this wouldn't be consistent with the evidence
Government of Canada (Ariey-Jouglard, Rachel Tu-Van)	Summary for policymakers	7	7	196	197	It is more the implementaiton of national scale strategies and action-plans, rather than just having them, that is important. Of course, having them is a first step. However, Chapter 6 shows that their implementation is still lacking.	Thank you for your comment - we recognise that this is the first step and that there is a need for comprehensive implementation.
Government of Chile (Ministry of the Environment)	Summary for policymakers	7	7	196	202	We suggest including "reduce harmful incentives"	Thank you for your comment - we acknowledge the unintended consequences of some incentives in the second order draft of the SPM
Government of Australia	Summary for policymakers	7	7	197	197	Replace "Market-based (e.g., economic incentives)" with "Market-based (e.g., economic) and other incentives,"	Thank you, this has been revised accordingly in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	7	7	198	198	Delete the , I think? Also put '(e.g., economic incentives)' after 'regulatory instruments'.	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	7	7	199	199	D3: suggest changing "firms" to "businesses"	Thank you, we have changed this in the second order draft of the SPM
Government of Germany	Summary for policymakers	7	7	200	200	Clarification needed: shouldn't it rather read (see proposed insert in bold): "... mitigation and/or eradication"? Rationale: Currently, it sounds like the categories of measures mentioned in L200 do not complement or support each other. Could it not be that management measures addressing advanced stages IAS in a first steps towards eradication could include mitigation/containment measures? Please explain the possibilities of combining measures to achieve a mid- to long-term policy goal.	Thank you, we have made changes to the paragraph in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	7	7	201	202	Since biological invasions are a global phenomenon	Thank you for your comment - we have addressed this in the second order draft of the SPM
Government of Argentina	Summary for policymakers	7	7	201	201	Saying that biological invasions is a global phenomenon seems inaccurate. Invasions are geographically located and, normally, do not extend throughout the globe. It is also different to state that a phenomena is global or a phenomena is international. If something is global, it should affect all countries in the globe. An international problem should affect two or more countries. There could be biological invasions that are not even international. Indeed, biological invasions are different form phenomena that are actually global, such as climate change. We suggest to rephrase as follows: "since the process of biological invasions can be an international phenomenon"...	Thank you but authors respectfully disagree.
Evans, Thomas	Summary for policymakers	7	7	202	202	with (not within)?	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Mexico (Saad Alvarado, Laura)	Summary for policymakers	7	7	202	203	I respectfully suggest to add some like: The precautionary principle of the CBD establishes that when there is a danger of considerable reduction or loss of biological diversity, the lack of absolute scientific certainty should not be used as a reason to postpone the adoption of measures that prevent or minimize this danger. Both the polluter pays principle and the precautionary principle (Vorsorgeprinzip) , can guide the decisions of the authorities in the case of biological invasions. In addition, economists have adopted bioeconomic models that can help design policies and economic instruments for IAS. Economic instruments are grouped into: taxes, charges, tariffs, tradable permit systems, environmental performance or responsibility bonds, insurance, deposit-reimbursement systems, and payments for environmental services, among others instruments of environmental policy. In addition, economic instruments can be complementary to environmental standards or command control policies. Some authors that have been studying economic instruments for IAS are Charles Perrings, Costanza, Barbier, Kettunen; among other cited in chapter 6.5.	Thank you, the paragraph has been revised to address this issue in the second order draft of the SPM
Government of Canada (Fraleigh, Brad)	Summary for policymakers	7	7	204	209	Where is the background for para. D.4?	Thank you, it was paragraph 31 of the first order draft of the SPM. Authors have worked to strengthen the link between these 2
Evans, Thomas	Summary for policymakers	7	7	205	206	What is "integrated adaptive governance"? You could say: 'Inclusive and collaborative stakeholder participation helps to promote wide ownership, acceptance, and capacity-building when forming and implementing policies for invasive alien species. This entails...'	Thank you, integrated and adaptive governance are defined in the glossary of the second order draft of the SPM
Government of Australia	Summary for policymakers	7	7	206	206	Replace "at it helps promote wide ownership" with "as it helps promote ownership, knowledge systems integration,"	Thank you for your comment - we have changed this to promote ownership, acceptance, and capacity building in the second order draft of the SPM
Government of Australia	Summary for policymakers	7	7	207	207	Replace "community engagement" with "community and other stakeholder engagement"	Thank you, this has been deleted and the comment is no longer relevant
Kamal Kumar Rai	Summary for policymakers	7	7	207	207	For IPLC capacity building should be in their own languages and culturally appropriate. Collaboration with IPLCs and their respective organizations should be based on the principle of FPIC	Thank you, authors agree but this level of detail is too important for the SPM
Curd, Amélia	Summary for policymakers	8	8	136	140	Suggestion to move point "C2" to the top of the list and making it point "C1", as it is THE most important message to get across	Thank you, but authors think frameworks for decision are more important, then prevention is seen as a sub-point.

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Curd, Amélia	Summary for policymakers	8	8	136	140	Suggestion to move point "C2" to the top of the list and making it point "C1", as it is THE most important message to get across	Thank you, but authors think frameworks for decision are more important, then prevention is seen as a sub-point.
Government of France	Summary for policymakers	8	8	136	140	Suggestion to move point "C2" to the top of the list and making it point "C1", as it is THE most important message to get across	Thank you, but authors think frameworks for decision are more important, then prevention is seen as a sub-point.
Kamal Kumar Rai	Summary for policymakers	8	8	209	209	...indigenous peoples and local communities throughout the policy planning, implementation, and monitoring process, ensuring full and effective participations of IPLCs.	Thank you, this would make the sentence too long and this point is covered elsewhere
Calderón, Isabel	Summary for policymakers	8	8	211	217	WTO databases on SPS measures (SPS IMS) are a good source of informations on measures adopted by Members to address trade related issues in this respect.	Thank you for your comment.
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	8	8	211	212	Suggest reframing this point to avoid mixed signals. Given that some management efforts have been successful (C1, C2, line 763, 6.3.2.1), improved information sharing is not truly essential for effective management. It does present an opportunity to improve decision making and management effectiveness.	Thank you, agreed.
Government of France	Summary for policymakers	8	8	211	217	Skills such as data analysis and interpretation are also essential and could be highlighted here.	Thank you, this is addressed in the chapter in the second order draft of the SPM
Grossart, Hans-Peter	Summary for policymakers	8	8	211	217	D5, I miss a brief statement that there is often a conflict with the CBD, Nagoya agreement as it can prevent the open exchange of sequence and biodiversity data...	Thank you, the lack of coordination among policy instruments and agreements addresses this point
Evans, Thomas	Summary for policymakers	8	8	212	216	Long line - lots of terms etc. Perhaps split after the word 'exchanges'? Also the repeating word 'identifying' is a bit awkward (line 215). In fact, is this part of the paragraph strictly relevant to data sharing... 'identifying new introductions and threats, identifying, characterising and quantifying impacts, and monitoring and evaluating management responses'? If not, then you could delete it.	Thank you, we have revised the paragraph accordingly in the second order draft of the SPM
Government of Germany	Summary for policymakers	8	8	213	213	Clarification needed: Is it necessary to address "open access"? I suppose that nearly all relevant data bases on Alien species are Open Access.	Thank you, it is relevant in this context. Kindly refer to chapter 6 for more information
Government of France	Summary for policymakers	8	8	217	217	"Multilateral engagement" is a term that is not very clear to the reader. It would be useful to specify in concrete terms what this means.	Thank you, this has been deleted from the second order draft of the SPM
Kamal Kumar Rai	Summary for policymakers	8	8	217	217	The role of ILK and related databases, inclusion of IPLCs, including women and youth, with human rights approach. Customary governing system of IPLCs for ILK related information management should be highlighted.	Thank you, we have addressed this comment in response to other comments in the second order draft of the SPM
Government of Belgium	Summary for policymakers	8	8	219	221	Title proposal: Improved communication and awareness will enhance predictive capacity and strengthen...	Thank you, agreed and rephrased in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	8	8	219	221	This point is well-framed.	Thank you for your comment
Government of Netherlands (Kreiken, Bob)	Summary for policymakers	8	8	219	227	Regarding the mainstreaming of understanding invasive alien species issues, mentioning sectors would be good. Such as : travel/tourist, wildlife trade and delivery/transport. These sectors are now scattered and named all over the SPM. Integrating it in the section D could give more weight to this Assessment being used by policymakers to engage sectors (considering that many stakeholders only read the SPM's summary).	Thank you, all sectors are now mentioned in the backgrounds of section D of the second order draft of SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	8	8	223	227	D6: "Increased understanding through integrative..." Sentence is way too long	Thank you, agreed and rephrased in the second order draft of the SPM
Razafiarison, Fanirisoa	Summary for policymakers	8	8	223	227	This perspective is very useful and necessary.	Thank you for your feedback.
Government of Chile (Ministry of the Environment)	Summary for policymakers	8	8	225	225	We suggest replacing "communication campaigns" by "communication strategies"	Thank you, agreed and rephrased in the second order draft of the SPM
Government of France	Summary for policymakers	8	8	225	226	"co-created community science": please explain what this refers to or use a clearer phrasing	Thank you, community science is defined in the glossary (please see citizen science)
Evans, Thomas	Summary for policymakers	8	8	226	227	This is a bit vague / generic: '... and other mechanisms that policy makers can support with necessary economic and networking resources'. Maybe delete? You could state (from line 224): '... can be achieved for example through co-designed communication campaigns, teaching from early years throughout the education life-cycle and co-created community science.'	Thank you, this has been rephrased and clarified accordingly in the second order draft of the SPM
Kamal Kumar Rai	Summary for policymakers	8	8	227	227	Full and effective engagement of ILK systems is essential, including its sciences, diversity, methods, and values, with attention to both written and oral knowledge. Inclusion of IPLCs, indigenous science, customary governing systems, socio-economic and ecological knowledge systems, and indigenous languages related with various ecosystems such as mountain, pasture and agro-ecosystems is important, as this all can inform on the ecological crisis due to IAS.	Thank you, authors agree with the reviewer
Furukawa, Takuya	Summary for policymakers	8	8	229	229	Is "One Biosecurity" a widely accepted concept in academic literature or policy arena, or just an emerging concept that requires further discussion and testing? I ran a literature search on WoS, but the number of articles, the diversity of authors, and citations suggest the latter, and I'm not sure if it should be highlighted here along with One Health.	Thank you, we have revised the text but believe this approach needs to be cited as an example. A definition has been included in the glossary.
Government of Argentina	Summary for policymakers	8	8	229	233	From the expressed wording it is inferred that any exploitation of natural resources would in itself constitute a threat to biodiversity, which turns out to be an excessively broad assessment. On the other hand, the Convention on Biological Diversity (CBD) refers to the "sustainable use of biological diversity" (emphasis added). For the reasons stated, it is suggested that the concepts of "legal and illegal" be replaced by "unsustainable".	Thank you, we have reworded this sentence to be more consistent with the Global Assessment's terminology
Government of Argentina	Summary for policymakers	8	8	229	233	Instead of the expression "legal and illegal", we suggest the use of the concept "unsustainable", which is in line with the terminology of the Convention on Biological Diversity, where the term "sustainable" is used related to the "sustainable use of biological diversity". We suggest modifying the text as follows: "Integrated governance approaches such as One Health and One Biosecurity will achieve transformative change for invasive alien species governance, explicitly taking into consideration ecosystems, animal, plant, and human health, and other threats to biodiversity such as climate change, land- and sea-use change, and the unsustainable exploitation of natural resources"	Thank you, we have reworded this sentence to be more consistent with the Global Assessment's terminology
Government of Argentina	Summary for policymakers	8	8	229	229	What is the "one biosecurity approach"? As far as we know, the one health approach has undergone a process of definition within the WHO, FAO, CBD, etc. If no multilaterally agreed definition exists for this approach, we suggest to delete it, given that positioned together with the One Health approach seems misleading.	Thank you, we have revised the text but believe this approach needs to be cited as an example. A definition has been included in the glossary of the second order draft of the SPM.

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Germany	Summary for policymakers	8	8	229	235	Clarification needed: Key message D7 refers to transformative change for IAS governance which will be achieved through approaches such as One health and One Biosecurity. What is meant by "One Biosecurity"? Firstly, it would be useful to explain the these two approaches briefly in the unbold text below since they appear now prominently in this key message. Secondly, there is a mismatch: while the key message claims that such approaches "will achieve transformative change", the explanatory unbold text refers to "can help", which is far less deterministic. Please ensure consistency in the terms.	Thank you, we have revised the text accordingly and these definitions have been added to the Glossary in the second order draft of the SPM
Government of Mexico (Koleff, Patricia)	Summary for policymakers	8	8	229	233	If you talk about integrated governance, do you have to talk about governance of invasive alien species, which is not clear?	Thank you, we have now clarified this statement and figure in the second order draft of the SPM
Government of UK (Mortimer, Diana)	Summary for policymakers	8	8	229	229	a footnote on One Health and One Biosecurity would be useful for the reader.	Thank you, these definitions have been added to the Glossary of the second order draft of the SPM
Evans, Thomas	Summary for policymakers	8	8	231	231	Delete 'other'? I don't think you list any threats previously in this paragraph.	Thank you, biological invasions are a threat too, but we have made it more explicit
Government of Chile (Ministry of the Environment)	Summary for policymakers	8	8	231	231	We suggest replacing "animal and plant" by "flora, fauna and fungi"	Thank you, this has been rephrased in the second order draft of the SPM
Taki, Hisatomo	Summary for policymakers	8	8	232	233	Based on page 7 line 181, are the words "legal and illegal" needed here?	Thank you, this has been deleted accordingly from the second order draft of the SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	8	8	233	235	D7 : "Integrative approaches can help harmonize legal and regulatory instruments across different sectors and scales and enhance adaptive governance and capacity-building" Sentence means absolutely nothing to me as a policy maker - what on earth is it asking me to do? Good example of waffle that could be deleted.	Thank you, we have edited the sentence and illustrated it with examples (One Health, One Biosecurity) in the second order draft of the SPM
Government of Germany	Summary for policymakers	8	8	235	235	Proposal: Currently, policy-relevant options are a bit scattered within and between different sections. We believe it would be useful to add a comprehensive list of evidence-based policy options at the end of Section "D" of the SPM in a non-prescriptive but policy-relevant form, preferably addressing options at different levels (local to international), including preparedness measures and measures for early and late interventions in terrestrial, freshwater, and marine systems to make ecosystems [more] resilient to IAS. To the extent that the knowledge base allows, aspects such as avoiding or minimizing trade-offs between different types of actions would also be useful, as would information on operationalization options at the required scale(s) of action including relevant actors (government, economic sectors etc., ...). Furthermore, it would be useful to include information in the table on how these options would support implementation of relevant international agreements (including the post-2020 global biodiversity framework and the SDGs).	Thank you, we have revised this section for clarity in the second order draft of the SPM
Kamal Kumar Rai	Summary for policymakers	8	8	235	235	ILK systems of IPLCs about Human and Animal Health practices related to biodiversity, ecosystems and indigenous governance need to be integrated to achieve transformative change. The diversity of Indigenous health related traditional practices, methods and values of IPLCs including healers, languages, behaviors, and cultural occupations need to be enhanced, based on the human rights of IPLCs. ILK on landscape and seascape changes and the invasion behavior of IAS in micro-climatic zones can be integrated in collaboration with IPLC experts or knowledge holders in accordance with indigenous sciences, customs. Science and technological transfer and capacity building for IPLCs may also be required.	Thank you, this is now included in section D
Pellens, Roseli	Summary for policymakers	9	13	1	370	The way the document is organised gives a good message about the interrelation between these impacts. Separating them would send the message that these impacts are dissociated, which is not the case.	Thank you for your feedback, much appreciated.
Government of Australia	Summary for policymakers	9	36	236	1018	Background: we found the format of background a bit unusual, with no referencing and instead 'categories' after statements (e.g. well-established, established but incomplete, etc). We could not find any appendix or other documentation that describes the criteria for these categories. And not ALL sentences have the bracketed categories (e.g. Line 299 doesn't say how established that statement is) so it's confusing how to interpret it. Suggest that some guidance be provided on what the categories in brackets mean and how to find the original source/reference for those reading the policy summary only and are interested in finding out more.	Thank you, we have corrected this in the second order draft of the SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	9	9	238	238	Also in 15 other places - reference to "good quality of life" - the word "good" is not needed - it is assumed by the phrase "quality of life".	Thank you, but authors have chosen to follow the IPBES conceptual framework terminology, including good quality of life
EL Houdi, Khadija	Summary for policymakers	9	9	239	239	"Biological invasions are caused by humans (well established)" it's important to clarify in which contexts and circumstances this introduction is done!	Thank you, the text has been revised accordingly in the second order draft of the SPM
Furukawa, Takuya	Summary for policymakers	9	9	239	239	The statement is just repeating the definition of the term given in the Glossary: "Biological invasion: process by which species intentionally or accidentally introduced outside of their natural range by humans, successfully establish and spread in their new environment."	Thank you, this sentence has been reworded in the second order draft of the SPM
Government of Canada (Fraleigh, Brad)	Summary for policymakers	9	9	239	239	Section 1.3.1 does NOT state that "Biological invasions are caused by humans". It states that "established presence [of IAS] in a region is attributable to human actions, intentional (i.e., directly) or unintentional (i.e., indirectly) ...etc."	Thank you, this sentence has been reworded in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	9	9	239	239	"well established" is not appropriate here, as it is not a finding, but in the definition.	Thank you, the text has been revised accordingly in the second order draft of the SPM
Government of Germany	Summary for policymakers	9	9	239	259	Proposal: This whole para is about the impacts of IAS, which threaten nature, NCPs and a good quality of life. As this section is part of the background, it would be very useful to more clearly describe the impacts: for instance, what are the impacts of IAS on health, food and cultural services (L247-L248)?	Thank you, we have added more details on the mechanisms in the seconds order draft of the SPM
Government of Netherlands (Groenewoud, H. E.)	Summary for policymakers	9	9	239	239	"Biological invasions are caused by humans (well established)": not 'well established', but by definition. There are also natural fluctuations in the number of species, and natural plagues. The other way around would be better: "Humans cause biological invasions"	Thank you, the text has been revised accordingly in the second order draft of the SPM
Government of USA	Summary for policymakers	9	9	239	239	Same point as above, invasions are not exclusively caused by humans.	Thank you, this sentence has been reworded in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Grossart, Hans-Peter	Summary for policymakers	9	9	239	1001	It is unclear to me to which sub-chapters the number, e.g. 1.3.1, refer to? Where do I find the respective documents?	Thank you, we have added an introductory paragraph in the second order draft of the SPM to explain the traceability.
Henk, Groenewoud	Summary for policymakers	9	9	239	239	"Biological invasions are caused by humans (well established)": not 'well established', but by definition. There are also natural fluctuations in the number of species, and natural plagues. The other way around would be better: "Humans cause biological invasions"	Thank you, the text has been revised accordingly in the second order draft of the SPM
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	9	9	242	242	'a major driver of loss.....' Quantify – this needs to state that it is one of the top 5.	Thank you for your comment, but authors think that this ranking is debatable (as it depends on the criteria used to rank drivers) and would undermine the messages of this assessment.
Tassin, Jacques	Summary for policymakers	9	9	242	242	a major driver' is not clear enough: please replace it as the fifth major driver, as written in IPBES report 2019,	Thank you for your comment, but authors think that this ranking is debatable (as it depends on the criteria used to rank drivers) and would undermine the messages of this assessment.
Government of Germany	Summary for policymakers	9	9	243	243	Proposal: Species richness and biodiversity cannot be used as synonyms. Please check carefully the terms used.	Thank you, we have deleted this part of the sentence from the second order draft of the SPM
Razafiarison, Fanirisoa	Summary for policymakers	9	9	244	244	For policymakers, it is more rewarding if statistics (percentage) will be provided on this line. It brings much more awareness.	Thank you, we have reworded this sentence, and statistics do not appear necessary anymore
Government of Germany	Summary for policymakers	9	9	246	246	Proposal: Please remove "native" from this line, as it seems unnecessary here.	Thank you for this suggested change, we have adopted it in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	9	9	247	248	This is perhaps difficult for a non-expert audience. Services like provision of oxygen are likely unaffected, while provision of "health" could cause confusion. Focussing on the types of services may be more powerful, as it could convey the range of impacts yet still use specific examples that people can relate to: "all types of NCP, including provisioning (eg food, feed, timber), regulatory (eg water regulation, carbon sequestration) and non-material (cultural, recreational) contributions, are negatively impacted."	Thank you for this suggested change, we have adopted it in the second order draft of the SPM
Government of Germany	Summary for policymakers	9	9	247	247	Proposal: Please replace: "All nature's contributions" with "Often [in most cases] nature's contributions"	Thank you, we have replaced with "all types of NCP" in the second order draft of the SPM
Government of UK (Mortimer, Diana)	Summary for policymakers	9	9	247	247	'All nature's contributions to people' - really all?	Yes, please refer to Chapter 4 for details
Albert, Arnaud	Summary for policymakers	9	9	248	249	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	9	9	248	249	This estimate as a minimum cost should be well established.	Thank you, but authors reached a consensus on this confidence level
Government of France	Summary for policymakers	9	9	248	249	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Government of Germany	Summary for policymakers	9	9	248	249	Clarification needed: Please specify these costs - what do they comprise and how were they assessed? Are these net costs (costs minus benefits of IAS)? Given uncertainties and data gaps (see key message A6), it might be helpful to give a range for the cost estimates.	Thank you, we have deleted this part of the paragraph on costs and have introduced it in another paragraph with more details in the second order draft of the SPM
Jactel, Hervé	Summary for policymakers	9	9	248	249	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Maillard, Jean-François	Summary for policymakers	9	9	248	249	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Poulet, Nicolas	Summary for policymakers	9	9	248	249	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Romero, José A.	Summary for policymakers	9	9	248	249	It would be helpful to specify the number of years that led to this estimate: " ... the estimated cumulative global costs over the last 50 years of invasive alien species are estimated to be more than 1,738 billion USD ... "	Thank you, we have changed this figure and introduced it with more caution and explanations in the second order draft of the SPM
Collas, Marc	Summary for policymakers	9	9	249	249	Key message A. This estimation is too global and it is hard to connect to anyone or any country. This estimation is better presented in the figure 2.	Thank you, we have changed this figure and introduced it with more caution and explanations in the second order draft of the SPM
EL Houdi, Khadija	Summary for policymakers	9	9	249	249	" global costs of invasive alien species are exceeding US\$ 1,738 billion" It could be helpful to show if some regions or countries bear the most of this cost and hence need action urgently!	Thank you, please see Figure SPM.2 for more information
Evans, Thomas	Summary for policymakers	9	9	249	249	the estimated cumulative global cost of invasive alien species exceeds	Thank you, we have clarified this figure in the second order draft of the SPM
Government of Canada (Frleigh, Brad)	Summary for policymakers	9	9	249	250	"the estimated cumulative global costs of invasive alien species are exceeding US\$ 1,738 billion" - please add "over the past 50 years" as in Section 4.4. Box 4.12.	Thank you, we have clarified this figure in the second order draft of the SPM
Government of France	Summary for policymakers	9	9	249	249	Add "billions per year" if it is an annual figure.	Thank you, we have clarified this figure in the second order draft of the SPM
Government of France	Summary for policymakers	9	9	249	249	Key message A. This estimation is too global and it is hard to connect to anyone or any country. This estimation is better presented in the figure 2.	Thank you, we have changed this figure and introduced it with more caution and explanations in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Germany	Summary for policymakers	9	9	249	249	Clarification needed: "Cumulative" - from which year or time period onwards?	Thank you, we have changed this figure and introduced it with more caution and explanations in the second order draft of the SPM
Government of Germany	Summary for policymakers	9	9	249	249	Proposal: It is suggested to change the text as follows: "...costs of invasive alien species exceed US\$ 1,738 billion"	Thank you, this has been revised accordingly in the second order draft of the SPM.
Government of USA	Summary for policymakers	9	9	249	249	What is the timeframe for the costs of invasive alien species? Is US\$1,738 billion an annual cost? Cumulative cost?	Thank you, we have clarified this figure in the second order draft of the SPM
Albert, Arnaud	Summary for policymakers	9	9	250	253	A.1. About the positive outcomes of IAS; there is a lack of examples, and perhaps it should be moved to another place.	Thank you, we have restructured the SPM, and added an example of positive impacts to the second order draft
Government of France	Summary for policymakers	9	9	250	253	A.1. About the positive outcomes of IAS; there is a lack of examples, and perhaps it should be moved to another place.	Thank you, we have restructured the SPM, and added an example of positive impacts to the second order draft
Government of France	Summary for policymakers	9	9	250	250	Some examples of some benefits or services provided by invasive alien species would be useful to illustrate this.	Thank you, examples are available in the chapter (please follow the traceability statement in curly brackets)
Government of USA	Summary for policymakers	9	9	250	253	Is this also related to how invasive species are defined? IAS are not defined in the assessment glossary, but the IPBES glossary defines them as "Species whose introduction and/or spread by human action outside their natural distribution threatens biological diversity, food security, and human health and well-being." The term "threaten" implies a negative impact.	Thank you, we have added an introductory paragraph in the second order draft of the SPM to address this comment and defined IAS
Brooks, Thomas	Summary for policymakers	9	9	251	251	Insert "by definition" after "positive impacts", before opening the brackets. This is important: the fact that invasive alien species are defined by negative impact means that this is a necessary result.	Thank you, the definition of invasive alien species has been clarified in the introduction, and we think this addition would decrease the readability of the paragraph.
Evans, Thomas	Summary for policymakers	9	9	251	252	I don't understand this? '(80% negative impacts on...)' 80% of what?	Thank you, we have clarified this in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	9	9	251	255	percentages here are uninterpretable, because we don't know what they are percentages of. Given known biases in the data, suggest something along the lines of: Between 71 and 85% of reported impacts to nature, nature's contributions to people and good quality of life are negative {4.3, 4.4, 4.5} and the overwhelmingly negative impacts are confirmed by Indigenous and local communities {4.6}." (71% drawn from Chap 4 line 685)	Thank you, we have reworded to indicate those are documented impacts.
Government of Germany	Summary for policymakers	9	9	251	252	Clarification needed: It is not clear what the percentages (80% & 85%) refer to. Are these also reported impacts, as expressed in the following sentence?	Thank you, we have clarified this in the second order draft of the SPM
Tassin, Jacques	Summary for policymakers	9	9	251	253	This sentence does not make sense. How can we compare, in a quantitative way, negative and positive impacts? I suspect that the bias is provided by a reference to positive versus negative impacts underpinning scientific publications. But can we be sure that the pressure of research efforts is equal between positive and negative impacts? We rather can be sure that the positive impacts are under-investigated.	Thank you, the methodology is outlined in Chapter 4 of the second order draft of the SPM
Albert, Arnaud	Summary for policymakers	9	9	253	259	A.1. The way it shows the impacts of IAS is really "human" focused, and not so much on what are the impacts on the biodiversity. This IPBES assessment should focus on environmental impacts as it is its primary role to assess the state of knowledge on biodiversity and ecosystem services.	Thank you, impacts on nature are also assessed. We have tried to make it clearer, noting that the scope of this assessment is defined in the scoping report, approved by member states at IPBES-6
Albert, Arnaud	Summary for policymakers	9	9	253	259	In addition to the assessment of ecosystem services and the state of knowledge on biodiversity, the IPBES also has a requirement and a role to take into account indigenous communities, and the inequalities that exist regarding gender. There needs to be a balance between messages about people and messages about biodiversity and ecosystem services.	Thank you, these issues are further covered in a different paragraph
Government of France	Summary for policymakers	9	9	253	259	A.1. The way it shows the impacts of IAS is really "human" focused, and not so much on what are the impacts on the biodiversity. This IPBES assessment should focus on environmental impacts as it is its primary role to assess the state of knowledge on biodiversity and ecosystem services.	Thank you, impacts on nature are also assessed. We have tried to make it clearer, noting that the scope of this assessment is defined in the scoping report, approved by member states at IPBES-6
Government of France	Summary for policymakers	9	9	253	259	In addition to the assessment of ecosystem services and the state of knowledge on biodiversity, the IPBES also has a requirement and a role to take into account indigenous communities, and the inequalities that exist regarding gender. There needs to be a balance between messages about people and messages about biodiversity and ecosystem services.	Thank you, these issues are further covered in a different paragraph of the second order draft of the SPM
Government of Germany	Summary for policymakers	9	9	253	253	Proposal: Please replace "Most" by "The majority".	Thank you, this has been revised accordingly in the second order draft of the SPM
Maillard, Jean-François	Summary for policymakers	9	9	253	259	A.1. The way it shows the impacts of IAS is really "human" focused, and not so much on what are the impacts on the biodiversity. This IPBES assessment should focus on environmental impacts as it is its primary role to assess the state of knowledge on biodiversity and ecosystem services.	Thank you, impacts on nature are also assessed. We have tried to make it clearer, noting that the scope of this assessment is defined in the scoping report, approved by member states at IPBES-6
Government of UK (Sarah Webster, Defra)	Summary for policymakers	9	9	256	266	Need to explain here that "realm" means terrestrial, freshwater and marine environments	Thank you, we have deleted this sentence and this comment is no longer relevant
Furukawa, Takuya	Summary for policymakers	9	9	257	258	Consider using "NCP" and delete "ecosystem services" since the two have very close meanings.	Thank you, this has been revised accordingly in the second order draft of the SPM
Nunes, Ana	Summary for policymakers	9	9	257	258	Throughout the SPM, I assumed that 'ecosystem services' were being referred to as 'nature's contributions to people'. But in these lines, both terms are mentioned, which sounds a bit redundant.	Thank you, this has been revised accordingly in the second order draft of the SPM
Kamal Kumar Rai	Summary for policymakers	9	9	260	260	ILK system on taxonomy must be incorporated	Thank you, authors agree but this level of detail is too important for the SPM
Albert, Arnaud	Summary for policymakers	9	9	261	264	A.2. The term "taxa" and "species" should be uniformized. Not everyone knows the definition of "taxa"; therefore there can be a benefit of using just "species".	Thank you, taxa and species are different, and authors prefer to keep both when necessary. Taxon is defined in the IPBES core glossary
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	9	9	261	262	The opening sentence would be clearer if shortened: Worldwide 39,191 taxa have been identified as alien species - note that there is an inconsistency with line 27 which uses 35,000 rather than 39,000. Point 1 above explains that IAS are a problem, and material in lines 267-269 belongs there. This point should focus on the number and distribution of IAS.	Thank you, we have revised this statement accordingly in the second order draft
Government of Germany	Summary for policymakers	9	9	261	261	Proposal: It is suggested not to give an exact number here, as the number changes on a daily scale. Please replace "39,191" by "more than 39,000". In general, we have to differentiate between first records and established species. Most probably the number 39,000 refers to "first records" and not to established species.	Thank you, we have revised this sentence accordingly in the second order draft of the SPM
Government of USA	Summary for policymakers	9	9	261	261	It would be helpful to clarify the definitions of alien species vs. invasive alien species earlier in the document.	Thank you, we have added an introductory section to address this comment in the second order draft of the SPM.
Grossart, Hans-Peter	Summary for policymakers	9	9	261	271	In this chapter (2.) I miss the aspect that invasion is often context dependent and almost any species can become invasive if the conditions are right... This is stated in the figure SPM.1, but it is not given in the text!	Thank you, but we are only considering invasive alien species (not just invasive species)

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Albert, Arnaud	Summary for policymakers	9	9	264	264	Even though the "10%" seems to be based on a real rigorous study, it seems a bit too close to Williamson's 10% rule of 1996.	Thank you, but this is not the case (we have rephrased this point in the revised version to clarify)
Eckbo, Norith	Summary for policymakers	9	9	264	267	Unclear message. Is "10 % of alien species are invasive" categorised as "established but incomplete", or is it that the underestimation is "established but incomplete"? Consider correcting to: "About 10% of alien species are also invasive (established but incomplete) {2.2, 4.2}, but their numbers are likely to be underestimated, and have profound adverse environmental and societal impacts (well established) {4.3.1, 4.4.1, 4.5.1}.	Thank you, this has been clarified in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	9	9	264	269	suggest this as an alternative "About 10% of alien species are also invasive, but this number is likely to be underestimated (established but incomplete) {2.2, 265 4.2}. While some invasive alien species, mainly those deliberately introduced, may have economic and societal benefits in some places, the impacts of the majority invasive alien species are overwhelmingly negative (well established) and many have profound adverse environmental and societal impacts (well established) {4.3.1, 266 4.4.1, 4.5.1} {4.3.1, 4.4.1, 4.5.1, Figure 4.1}". The reason is that by definition invasive alien species are defined by their negative impacts, so the first part of the second sentence is somewhat contradictory. The species get classified as invasive because of their negative impact.	Thank you. We have edited this paragraph substantially and it reflects the reviewer's concerns
Government of Norway	Summary for policymakers	9	9	264	264	Antarctica is mentioned, but not arctic regions. There are several examples of invasive species in the Arctic.	Thank you, we have added Arctic in the second order draft of the SPM
Government of France	Summary for policymakers	9	9	267	267	One species can be invasive in one country or area and not invasive in an another one. We must explain that invasiveness is not equal everywhere.	Thank you, this is the focus of section B
Government of Germany	Summary for policymakers	9	9	267	271	Proposal: Please consider changing the order of the two sentences for better readability.	Thank you, the second sentence has been deleted, and this comment no longer applies
Government of USA	Summary for policymakers	9	9	267	267	Insert the word some between While and invasive so sentence reads: While some invasive alien species,	Thank you, this sentence has been deleted, but your point has been captured elsewhere in the SPM
Government of USA	Summary for policymakers	9	9	267	269	This supports our point made at the beginning of the document. The first section of the document makes too many blanket statements and could be viewed as confusing for policymakers. In addition, this sentence can be deleted in this paragraph since it is already stated in lines 250-252.	Thank you, repetitions have been deleted and this section has been reworded accordingly in the second order draft of the SPM
Lieurance, Deah	Summary for policymakers	9	9	267	269	Redundant--repeats points made in lines 250-259.	Thank you, repetitions have been deleted in the from the second order draft of the SPM
Evans, Thomas	Summary for policymakers	9	9	268	268	Are they invasive is they are associated with positive impacts? Maybe just 'While alien species...'	Thank you, invasive alien species can have positive impacts (please see preamble for clarification)
Evans, Thomas	Summary for policymakers	9	9	268	269	the majority of the impacts caused by alien species are negative	Thank you, this sentence has been deleted in the revised version and this comment no longer applies
Government of France	Summary for policymakers	9	9	269	271	It is difficult to understand whether certain extreme events also contribute to the movement of certain species outside their area of origin.	Thank you for your comment. They do, but authors thought this point was not relevant in this paragraph.
Government of France	Summary for policymakers	9	9	270	271	The report suggest that « alien species, including pathogens and their vectors, are moved from one area to another both intentionally and accidentally by trade, transport and travel. » However, in Figure SPM.2, there are not information on the proportion of alien species movements due to trade, transport and travel.	Thank you, Figure SPM.2 shows the an overview of selected impacts. The reviewer was probably thinking about Figure SPM.1, whose purpose is to define native, alien and invasive alien species and does not focus on drivers.
Government of Mexico (Barrios, Yolanda)	Summary for policymakers	9	9	271	271	accidentally by "activities such as" trade, transport and travel. These are not the only activities	Thank you, we have revised this sentence accordingly in the second order draft of the SPM
Government of USA	Summary for policymakers	9	9	271	271	In addition to trade, transport, and travel, invasions are occasionally cause by natural or environmental processes (e.g., climate change, storms, currents)	Thank you, we have added "such as" to clarify that those were not the only causes.
Curd, Amélia	Summary for policymakers	10	10	178	183	Suggest switching the title of D1 to the sentence lines 181-183 "Comprehensive multi-scale...". Suggest changing end of sentence which currently reads as "are very important" to "are essential".	Thank you but we may not use policy prescriptive language
Government of USA	Summary for policymakers	10	10	185	185	Recommend eliminating the reference to the Aichi Biodiversity Targets or providing more context for the targets' completion date.	Thank you, we have revised the second order draft of the SPM as suggested
Brooks, Thomas	Summary for policymakers	10	10	272	272	Fig SPM1 is useful. Suggest adding https://www.cbd.int/invasive/terms.shtml as the key source in the legend - ensuring consistency with CBD definitions here is essential	Thank you, but our key source for definitions is the scoping report, approved by IPBES member states at IPBES-6
Collas, Marc	Summary for policymakers	10	10	272	272	Figure 1. It should overlap the orange triangle over each of the transports.	Thank you, this figure has been redesigned and the comment is no longer relevant
Diaz, Sandra	Summary for policymakers	10	10	272	272	Figure SPM 1: nice figure. I suggest a slight cahnge to the sentence "impacting ecosystems and nature's contributions to people, economy, or other constituents..." with "impacting native nature, natures/contributions to people, the economy, or other consittuents.."	Thank you, we have decided not to address this comment, as IAS are considered as drivers in this assessment - adding "native" may raise suspicions and complicate the SPM
Evans, Thomas	Summary for policymakers	10	10	272	272	Fig. SPM 1. Area and Time could be Caps	Thank you, this figure has been redesigned and the comment is no longer relevant
Government of Belgium	Summary for policymakers	10	10	272	272	Figure SPM 1: Not all the spreading species cause damages. Better to indicate spread and impact into 2 separate boxes on the figure. Text above the figure to be adapted.	Thank you, we have considered this comment when revising the figure
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	10	10	272	273	Figure SPM 1: This is a very effective graphic. I think it important here to include in the text the idea that species are only considered invasive if they have negative impacts. This is in keeping with the large majority of definitions of IAS, includgn the IPBES core glossary and the CBD. Please see related comments on Chapter 1. Regarding the figure itself, the arrows in the circle labelled invaded range suggest spread. It would be more intuitive label the grey arrow "introduction," remove the "invaded range" circle, and represent establishment as a small orange circle establishing inside the larger grey circle (perhaps near an edge). Spread could them be indicated by arrows or growth in the size of the orange circle. This would also align more closely to the invasion curve underneath. The caption could introduce the invasion curve, as well: "Definition of key terms and stages of the invasion curve"	Thank you, we have clarified the figure, but chose to retain the wording from the definition in the scoping document.
Government of Chile (Ministry of the Environment)	Summary for policymakers	10	10	272	272	Figure SMP.1: The images are not self-explaining, and icons are not clear. We could not guess what is the green one, right begore the \$ icon.	Thank you, we have changed the icons in the second order draft of SPM
Government of France	Summary for policymakers	10	10	272	272	Figure SPM.1 : It would be useful and more meaningful to include a drawing representing human genetic manipulation in the transition from native to alien species.	Thank you, this is a very general conceptual figure and we have chosen not to include this level of detail

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of France	Summary for policymakers	10	10	272	272	Figure SPM.1: Figure SPM.1: The proposed definition of alien species does not include species derived from human genetic manipulation (e.g. plants). It is not clear whether these species are not considered "alien species" or not.	Thank you, we have clarified this, but refer to the definition from the scoping document that cannot be changed
Government of Germany	Summary for policymakers	10	10	272	273	Clarification needed on Figure SPM.1: The idea of showing the key terms and concepts related to IAS is highly appreciated. However, the figure needs some elaboration to fully fulfill its purpose. Explanation in the top box: The definition of alien species and invasive alien species is key to understanding the assessment. Therefore we would encourage the authors to make sure that both terms are used consistently throughout the assessment. Furthermore, it is suggested to expand on the topic " impacts on ecosystems ". Rationale: The definition of IAS in this figure specifies IAS as species "impacting" ecosystems and NCPs - which allows for positive as well as negative impacts. So far, e.g. in Key message A the term IAS was only used in conjunction with negative impacts (detrimental impacts, p.1 L.5, adverse impacts, p.1, L10 etc). The extent of impact may depend on the condition/ resilience of an ecosystem. A degraded or degrading ecosystem may be more vulnerable to IAS impacts than a quasi-intact ecosystem (see also L331-L332, which states that biological invasions are often exacerbated by other forms of environmental change ...) as well as L420-L422, and L548-L550 with very similar statements). Top right box: IAS impacts are visualized by symbols (leaf damage, financial impacts and pandemics). Are these the most essential impacts of IAS? It would be essential to provide a clear and comprehensive picture of the impacts of IAS beforehand. The following para (A.3) highlights IAS as a root cause for major global extinctions - maybe this impact is also worth including in Figure SPM.1? Furthermore, it is not clear what the bitten-off leaf actually has to do with IAS. Please check if you can find another, more comprehensive symbol. Box bottom right in dark green: The rising dotted curve indicates that an IAS continues to spread after its introduction and reaches a maximum at some point (flattening of the curve). Given the incomplete state of knowledge, we would like to ask if this dotted curve represents the only (standard or generalised) evolution of an IAS in a biome (see also L335-L337 which state that "... it is difficult to predict [...] what the outcomes of an invasion might be. This poses a particular challenge for designing [...] solutions")?	Thank you. Native, alien and invasive alien species have been clearly defined. The curve has been deleted and icons have been changed to avoid confusion. Impacts on ecosystems are now represented clearly on the bottom right corner in the second order draft of the SPM
Government of Mexico	Summary for policymakers	10	10	272	272	Figure SPM.1: The yellow circles to illustrate the transition from establishment to spread are not fully clear. The images used for impacts are not clear either: the green leaf (I assume it is a leaf, but it took me a while to understand it was a leaf) is not so intuitive, the \$ and the human drawings seem to convey the message that IAS only impact humans in health and economy. The design needs more work using the information in lines 294 and 295.	Thank you, this figure has been redesigned and the comment is no longer relevant
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	10	10	272	272	Figure SPM.1 'so called invasive alien species'. Delete 'so called'.	Thank you, we have revised the figure accordingly in the second order draft of the SPM
Government of USA	Summary for policymakers	10	10	272	272	Figure SPM.1: The green shape in the Invasive Alien Species box (next to \$) is not very clear. I assume it is showing deterioration of natural species, but could a different symbol be used here?	Thank you, this figure has been redesigned and the comment is no longer relevant
Hudin, Stéphanie	Summary for policymakers	10	10	272	272	Figure 1. None of the definitions can reach all the different publics. In this figure we have the correct elements. Good work, I have nothing to add to it.	Thank you for your feedback.
Lang, Iris	Summary for policymakers	10	10	272	272	Figure 1. The "entry point" should be in the limit before establishment (and not representing all the transport figures).	Thank you, this figure has been redesigned and the comment is no longer relevant
Participants of ILK dialogue workshop (Guadalupe Yesenia Hernández Márquez)	Summary for policymakers	10	10	272	272	Fig. SPM 1. Suggest to make a difference between the country "A" and country "B" with one type of color for each one. Because as is shown, it seems as both are the same place.	Thank you, this figure has been redesigned and the comment is no longer relevant
Taki, Hisatomo	Summary for policymakers	10	10	272	272	Figure SPM. 1: In the figure, adding the meanings of green and orange colors in the above parts would help readers to understand more.	Thank you, this figure has been redesigned and the comment is no longer relevant
EL Houdi, Khadija	Summary for policymakers	10	10	273	273	Figure SPM 1: "Defining invasive alien species and important concepts". It should be clarified if all invasive species are alien or due to some activities and drivers, some native species could also become invasive! This is important for policy makers to know which activities could be the most harmful for men and nature.	Thank you, we have clarified definitions of native, alien, and invasive alien species
Government of France	Summary for policymakers	10	10	273	273	Figure SPM.1 : Put "invasive" in bold in the top paragraph as this is the first time the term is used.	Thank you, this figure has been redesigned and the comment is no longer relevant
Jactel, Hervé	Summary for policymakers	10	10	273	273	Figure SPM.1 : Put "invasive" in bold in the top paragraph as this is the first time the term is used.	Thank you, this figure has been redesigned and the comment is no longer relevant
Lieurance, Deah	Summary for policymakers	10	10	273	273	Figure SPM 1. I like this figure very much, I do think that the concept of spread could be better represented as multiple new populations (more than these 2). The slope of the spread phase could be steeper.	Thank you, we have revised the figure accordingly in the second order draft of the SPM
Stiger-Pouvreau, Valérie	Summary for policymakers	10	10	273	273	Figure SPM.1 : For the "Widespread" part: Some invasive species tend to regress over time, at least in the marine environment, and this is not represented on the graph which only shows a plateau trend.	Thank you, this figure has been redesigned and the comment is no longer relevant
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	10	10	275	276	This is a stronger, clearer statement than used for A3 (32-34), and I would suggest it be used for the key messages as well. Biodiversity declines should precede extinctions, as extinctions are a special case of declines.	Thank you, we have revised the text accordingly in the second order draft of the SPM
Government of Germany	Summary for policymakers	10	10	275	275	Proposal: We suggest to omit the term "native" here. Rationale: Whenever we are not talking about alien species, we are referring to native. Thus, we suggest the term is superfluous here and elsewhere.	Thank you, we have revised the text accordingly in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	10	10	275	288	Should it not be "Global extinctions have been caused more often by..."? And "resulted" on line 278. And also on line- 283 "have been more frequent"	Thank you, we have reworded this sentence to clarify (following other reviewer's suggestions too) in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Takahashi, Yasuo	Summary for policymakers	10	12	275	288	Paragraph 3, with Figure SPM.2, gives an impression that the negative impacts of IAS are exaggerated. These presentations might need more careful explanations/caveats. For example, the bottom left bar chart in Figure SPM.2 presents that IAS is the most important factor of species extinction. That may be true, but may give an impression to busy readers that this presentation contradicts with the Global Assessment SPM which states that land/sea use change is the most important factor. For me it is clear that "loss of nature" in the Global Assessment SPM and "species extinction" in the IAS SPM FOD are totally different metrics. But this difference may not be clear for some readers.	Thank you, the figure and second order draft of the SPM have been revised accordingly, and methodology is available in Chapter 4.
Albert, Arnaud	Summary for policymakers	10	10	276	277	Specify that these are IUCN Red List data and their own methodologies (see Smith, K. 2020. The IUCN Red List and invasive alien species: an analysis of impacts on threatened species and extinctions. IUCN). It should be made clear that this is a first factor of extinctions, as opposed to a first factor of erosion of biodiversity loss.	Thank you, we have reworded this paragraph to clarify this point in the second order draft of the SPM
Government of Belgium	Summary for policymakers	10	10	276	277	New and interesting statement. Maybe to be reflected in title: IAS are the most important drivers of biodiversity loss.	Thank you, we have reworded this paragraph to clarify that IAS are one of the most important drivers of biodiversity loss.
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	10	10	276	277	Box 4.3 does not support this interpretation; it says that IAS is the most common contributing factor to extinctions recorded in the Red List - and these are noted as 90% on islands. Box 4.6 is a case study and cannot be extrapolated to a general finding. I could find no text in section 4.3 that supported the overall statement. This material is accurately covered in point B5 (100-101); duplication could be removed.	Thank you, in the second order draft of the SPM, we have reworded this paragraph for clarification
Government of France	Summary for policymakers	10	10	276	277	Delete the sentence "Global extinctions are morebiodiversity change", in fact extinctions are rather caused by ecosystem change/destruction, and secondarily these destructions facilitate the spread of IAS which amplify the extinctions.	Thank you, we have reworded this paragraph for clarification in the second order draft of the SPM
Government of Germany	Summary for policymakers	10	10	276	277	Clarification needed: Does this statement align with the following statement copied out of the SPM of the IPBES Global Assessment: "The direct drivers of change in nature with the largest global impact have been (starting with those with most impact): changes in land and sea use; direct exploitation of organisms; climate change; pollution; and invasion of alien species."? Please also cf. New Scientist: "86 per cent of the extinctions ascribed to invasive species occurred on islands, where endemic species have small populations and are poorly adapted for predators or environmental changes. On continents, it's a different story. Probably, habitat destruction is on continents the most imprtant factor." Read more: https://www.newscientist.com/article/2077702-invasive-species-blamed-as-second-biggest-cause-of-extinctions/#ixzz7HYpWLOcp	Thank you, we have reworded this paragraph to clarify this in the second order draft of the SPM
Government of Germany	Summary for policymakers	10	10	276	277	Proposal: Given the facts that the impacts of IAS on nature and nature's contribution to people are always interlinked with other drivers of global change (cf. Key message A3, p. 1, L32-L37 & B4, p. 3, L90-L96) and most of all existing species (as well as the species becoming extinct in the past 50 years) are still unknown, the statement "Global extinctions are more often caused by invasive alien species than by other drivers of biodiversity change" (L276-L277) seems problematic/ too uncertain from a scientific point of view. Please check and re-formulate the phrases.	Thank you, this has been revised and better introduced accordingly in the second order draft of the SPM
Government of Netherlands (Groenewoud, H. E.)	Summary for policymakers	10	10	276	276	"Global extinctions are more often caused by...": This is only true for isolated and specialized populations, e.g. on isolated islands and not the Brazilian rainforest. Mind that if used as a general statement, in a political context this could backfire and be used as an argument to cut investments in nature conservation ("...for we could better focus on combatting invasive aliens species instead of...")	Thank you, in the second order draft of the SPM, we have reworded this sentence to clarify (following other reviewer's suggestions too)
Henk, Groenewoud	Summary for policymakers	10	10	276	276	"Global extinctions are more often caused by...": This is only true for isolated and specialized populations, e.g. on isolated islands and not the Brazilian rainforest. Mind that if used as a general statement, in a political context this could backfire and be used as an argument to cut investments in nature conservation ("...for we could better focus on combatting invasive aliens species instead of...")	Thank you, in the second order draft of the SPM, we have reworded this sentence to clarify (following other reviewer's suggestions too)
Jactel, Hervé	Summary for policymakers	10	10	276	277	This is a strong statement. The message should not be so strong. For example, insect extinctions are mainly caused by insecticides (pollution), the extinction of forest biota by deforestation and forest fires.	Thank you, we have reworded this paragraph to clarify this point in the second order draft of the SPM
Pellens, Roseli	Summary for policymakers	10	10	276	276	Box 4.4: page 23 line 846 states that the the factors driving to extinctions relies on expert opinion and is thus invalidated. The IUCN figures used for this statement do not take in consideration the many species lost by land-use change and pollution in the recent years. The impact of IAS on Biodiversity is much less important than these drivers. Putting these numbers in evidence here might deviate the attention of the importance of stopping those main drivers, that are, in many cases, promoting the access of IAS in new areas. So, here we should highlight the fact that we are talking about extinctions documented by IUCN, whose factors mostly rely on expert opinions that are not validated.	Thank you, in the second order draft of the SPM, we have reworded this paragraph for clarification
Pellens, Roseli	Summary for policymakers	10	10	276	277	Not consistent with major international findings (e.g. IPBES, CBD report). Box 4.4 based on a single dataset (IAS Red List). Expert judgement methodology and data available for some species, mainly on islands. "Among globally documented extinctions that are recorded by the IUCN Red List.	Thank you, we have reworded this paragraph to clarify this point
Sarat, Emmanuelle	Summary for policymakers	10	10	276	277	Specify that these are IUCN Red List data and their own methodologies (see Smith, K. 2020. The IUCN Red List and invasive alien species: an analysis of impacts on threatened species and extinctions. IUCN). It should be made clear that this is a first factor of extinctions, as opposed to a first factor of erosion of biodiversity loss.	Thank you, we have reworded this paragraph to clarify this point in the second order draft of the SPM
Sigala, Pierre	Summary for policymakers	10	10	276	277	Delete the sentence "Global extinctions are morebiodiversity change", in fact extinctions are rather caused by ecosystem change/destruction, and secondarily these destructions facilitate the spread of IAS which amplify the extinctions.	Thank you, we have reworded this paragraph for clarification in the second order draft of the SPM
Soubeyran, Yohann	Summary for policymakers	10	10	276	277	Specify that these are IUCN Red List data and their own methodologies (see Smith, K. 2020. The IUCN Red List and invasive alien species: an analysis of impacts on threatened species and extinctions. IUCN). It should be made clear that this is a first factor of extinctions, as opposed to a first factor of erosion of biodiversity loss.	Thank you, we have reworded this paragraph to clarify this point in the second order draft of the SPM
Brooks, Thomas	Summary for policymakers	10	10	278	278	Important to add a sentence about relative prevalence of extinction risk driven by invasive alien species (as well as the text already in place on actual extinctions). Something like "Invasive alien species are also the fourth most prevalent driver of species extinction risk, as documented by threats to species assessed as threatened on the IUCN Red List of Threatened Species {4.3.1}" (Box 4.4 is particularly important here)	Thank you, we have reworded this paragraph to clarify this point in the second order draft of the SPM
Government of France	Summary for policymakers	10	10	278	283	The message concerning interactions with multiple drivers of change is already developed in message 6. It could be deleted here.	Thank you, we have deleted the repetitions in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	10	10	280	280	How is this not well established? Certainly some extinctions are IAS-driven, and certainly some result from a combination of IAS and other drivers. To be consistent, driver terminology should align exactly GABES, here and elsewhere, and "overexploitation" should replace "legal and illegal resource extraction," particularly as it is also more correct.	Thank you, we have deleted this sentence and this comment is no longer relevant

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Estonia (Otsus, Merit)	Summary for policymakers	10	10	280	280	"legal and illegal resource extraction" - shouldn't it be replaced with "unsustainable use/overexploitation of species", either legal or illegal?	Thank you, we have deleted this sentence and this comment is no longer relevant
Government of Germany	Summary for policymakers	10	10	280	280	Proposal: Replace second "and" in line with "as well as".	Thank you, this sentence has been revised in the second order draft of the SPM
Eckbo, Norith	Summary for policymakers	10	10	281	282	This sentence is too technical, and can lead to unnecessary confusion, consider rewrite so that it is more clear that other drivers of ecosystem change can amplify the individual impacts of alien species - and/or vice versa.	Thank you, we have deleted this sentence and this comment is no longer relevant
Government of France	Summary for policymakers	10	10	283	284	The fact that then extinctions are more important on the islands is already explained in message n° 16. It could be deleted here.	Thank you, we have reduced the overlaps in the second order draft of the SPM
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	10	10	283	284	'Local and global extinctions.....' This needs to be quantified – at least for some taxonomic groups – birds perhaps?	Thank you, this now appears in Figure SPM.2 of the second order draft
Grossart, Hans-Peter	Summary for policymakers	10	10	283	284	Again, I miss a statement on why islands are more vulnerable, i.e. since many niches are occupied by local species which are occupied by other species on the mainlands!	Thank you for your comment - we have increased the information on context at various places within the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	10	10	284	286	This also seems well established. Perhaps there would be greater comfort in the confidence level if the sentence were slightly rephrased (and I will take the opportunity to expand a little): IAS have caused impacts in all realms, as well as in protected areas and particularly on islands.	Thank you, this has been corrected in the second order draft of the SPM
Government of USA	Summary for policymakers	10	10	284	285	Why are protected areas called out specifically here?	Thank you. In the second order draft of the SPM, this has now been moved to B, as it is about context
Government of Chile (Ministry of the Environment)	Summary for policymakers	10	10	286	288	We suggest adding the pressures or direct threat through IAS cause decline in populations and performance	Thank you, this has been revised accordingly in the second order draft of the SPM
Tassin, Jacques	Summary for policymakers	10	10	286	286	Please replace 'the most common impacts' by 'the most perceived and measured impacts'. Impact is not an object by itself but a product of human appreciation, even if it is provided through scientific investigation.	Thank you, this has been deleted and the comment is no longer relevant
Evans, Thomas	Summary for policymakers	10	10	287	287	Not sure about 'performance of a local population'? Do you mean decline in performance of individual native species as well as declines in the size of populations of native species?	Thank you, this has been revised accordingly in the second order draft of the SPM
Kamal Kumar Rai	Summary for policymakers	10	10	289	289	Does this consider microorganisms? IPLCs are using different native microbes in various ways that interconnect with ILK systems and values in these societies. Because of IAS the natural ecosystems or ecology can be changed for such micro biomes that are beneficial for humans, animals or the entire environment.	Thank you, microorganisms are indeed included in this assessment, although there are significant knowledge gaps on this topic
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	10	10	290	297	This is clear and easy to follow. Line-of-sight is missing from line 295. Some IAS are diseases or disease vectors for zoonotics, etc.	Thank you, we have added the line-of-sights for all statements in the second order draft of the SPM
Government of New Zealand (Perry, Joanne)	Summary for Policymakers	10	11	290	305	this paragraphs need to also include the loss of ILK to undertake traditional practices, spiritual wellbeing impacts due to loss of "mana" when areas are no longer able to be managed well, as well as a loss of landscape values. (e.g. in NZ wilding pines are altering iconic landscapes)	Thank you, this is now included under cultural identity of the second order draft of the SPM
Furukawa, Takuya	Summary for policymakers	10	10	292	292	NCP should be spelled "nature's contributions to people"	Thank you, we have corrected this in the second order draft of the SPM
Government of Germany	Summary for policymakers	10	10	292	292	Proposal: Typo: it should read "nature's".	Thank you, this has been addressed in the second order draft of the SPM.
Takahashi, Yasuo	Summary for policymakers	10	10	292	292	nature contributions to people -> nature's contributions to people	Thank you, we have revised the sentence accordingly in the second order draft
Tassin, Jacques	Summary for policymakers	10	10	292	292	Please insert 'greatly' before 'depend'. We have to struggle with any amalgam. All invasive species and all invaded ecosystems are very far to be equal.	Thank you, we have added "often", which is more aligned with the evidence in the second order draft of the SPM
EL Houdi, Khadija	Summary for policymakers	10	10	294	295	Impacts on good quality of life include threats on livelihoods, on water systems , on forests, seas, oceans, on all ecosystems and on food security, on the economies and on human health	Thank you for your comment. The suggested additions are all included in "livelihoods", "water and food security" and other indicated terms.
Evans, Thomas	Summary for policymakers	10	10	294	295	the economies? You have livelihoods so delete?	Thank you, authors do not think economies and livelihoods are similar
Government of Argentina	Summary for policymakers	10	10	294	294	Water security and food security are two different things. We suggest to separate the terms and include a footnote on water security that quotes the definition of VIII Phase Strategy of the IHP-UNESCO: "the capacity of a population to safeguard access to adequate quantities of water of acceptable quality for sustaining human and ecosystem health on a watershed basis, and to ensure efficient protection of life and property against water related hazards -- floods, landslides, land subsidence, and droughts".	Thank you, authors agree but think this way is easier to understand and read
Government of Germany	Summary for policymakers	10	10	294	295	Proposal: The correct preposition to be used after "threats" is "to". Therefore all "on" in the sentence should be replaced by "to".	Thank you, we have revised this paragraph in the second order draft of the SPM
Lieurance, Deah	Summary for policymakers	10	10	294	294	Again with the "good quality of life". Remove Good. ALSO IN LINE 314. Remove throughout document	Thank you, authors have tried to follow the IPBES conceptual framework and its terminology (including "good quality of life")
Government of Australia	Summary for policymakers	10	10	295	295	Replace "economies and on human health (e.g., diseases, allergies and physical injuries)" with "economies, on human health (e.g., diseases, allergies and physical injuries) and other social values"	Thank you, we have removed "on", which hopefully addresses the reviewer's concern
Government of USA	Summary for policymakers	10	10	295	295	Modify to include "on animal and human health"	Thank you but good quality of life applies to humans. Also animal health may be included in "livelihoods".
Furukawa, Takuya	Summary for policymakers	10	11	297	299	Very interesting and important statement. Please specify the confidence level.	Thank you, this has been corrected in the second order draft of the SPM
Government of Canada (Alexander, Steven)	Summary for policymakers	10	11	297	299	Critically important point. Though it looks like a confidence statement was not included at the end of the statement.	Thank you, this has been corrected in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	10	11	297	299	The chapter section does not support a strong statement here - Chap 4 line 3063 says "might" and highlights the lack of knowledge. At a minimum, I would suggest removing "threatening their family and their own livelihoods." There is no need to focus on only those two elements, and while IAS pose threats to livelihoods, they generally don't threaten people directly.	Thank you, this is further developed in Chapter 4 (please follow the traceability statement)
Government of France	Summary for policymakers	10	10	297	299	Key message 4. "The negative impacts over the women are bigger"...this phrase is not developed and it is hard to find the reason why it is there. Perhaps it should be better developed. A few examples could help.	Thank you, this is further developed in Chapter 4 (please follow the traceability statement)
Government of Germany	Summary for policymakers	10	11	297	299	Clarification needed: Please explain how social inequalities and gender roles lead to larger impacts by IAS on women.	Thank you, this is further developed in Chapter 4 (please follow the traceability statement)
Government of USA	Summary for policymakers	10	11	297	299	This statement needs a confidence level.	Thank you, this has been corrected in the second order draft of the SPM
Lang, Iris	Summary for policymakers	10	10	297	299	Key message 4. "The negative impacts over the women are bigger"...this phrase is not developed and it is hard to find the reason why it is there. Perhaps it should be better developed. A few examples could help.	Thank you, this is further developed in Chapter 4 (please follow the traceability statement)
Lang, Iris	Summary for policymakers	10	11	297	299	Same comment as for lines 42-44, explain how women are especially affected by invasive species because of social inequalities	Thank you, this is further developed in Chapter 4 (please follow the traceability statement) of the second order draft of SPM
Sieffert, Laetitia	Summary for policymakers	11	11	229	229	D7 excellent inclusion of the One Health and One Biosecurity approaches, indeed integrative approaches and interlinkages with other existing initiatives are the way forward.	Thank you for your feedback.
Albert, Arnaud	Summary for policymakers	11	11	299	300	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Diaz, Sandra	Summary for policymakers	11	11	299	299	replace "global costs" with "global economic cost"	Thank you, we think the sentence is explicit as it is but we have rephrased it to be easier to understand in the second order draft of the SPM
Eckbo, Norith	Summary for policymakers	11	11	299	301	Unclear message. Are the global costs categorised as "established but incomplete" or is the underestimation "established but incomplete"? And is the underestimation the explanation to why it is "established but incomplete"??	Thank you. Kindly refer to chapter 4 for the methodology, it is established (as documented) but incomplete (under estimated)
Evans, Thomas	Summary for policymakers	11	11	299	299	which threaten their own livelihoods and their families	Thank you, we have reworded this sentence and the comment is no longer relevant (we have removed families)
Government of Belgium	Summary for policymakers	11	11	299	301	Possibility to make the distinction between the costs of damage and the costs of management as in InvaCost?	Thank you, please refer to chapter 4 for the methodology. Authors believe it is more important to give the overall documented cost in the SPM
Government of Canada (Fraleigh, Brad)	Summary for policymakers	11	11	299	300	"Global costs of invasive alien species amount to US\$ 1,738 billion". Replace "amount to" by "have been estimated at". Please add "over the past 50 years" as in Section 4.4. Box 4.12.	Thank you, we have changed this figure and introduced it with more caution and explanations in the second order draft of the SPM
Government of France	Summary for policymakers	11	11	299	300	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Government of France	Summary for policymakers	11	11	299	300	The costs associated with damage and loss due to alien invasive species are already given in message 1. It could be deleted here.	Thank you, we have reduced the overlaps in the second order draft of the SPM
Government of Germany	Summary for policymakers	11	11	299	300	Proposal: We suggest to rephrase the text as follows: "Global costs of invasive alien species may amount to US\$ 1,738 billion, but are likely to be underestimated." However, some inconsistencies still occur - which costs are these? Are these cumulative costs? To which period do they refer? Furthermore, this information is repetitive (see also L6, L25, Figure SPM.2, L249). We very much welcome the useful information on the exact impacts which led to the estimated cost figure. As this cost figure appears prominently in the SPM, please ensure that it's properly backed up and explained clearly.	Thank you, we have changed this figure and introduced it with more caution and explanations in the second order draft of the SPM
Government of Mexico	Summary for policymakers	11	11	299	300	This information is already mentioned in line 249.	Thank you, we have reduced the overlaps in the second order draft of the SPM
Jactel, Hervé	Summary for policymakers	11	11	299	300	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Maillard, Jean-François	Summary for policymakers	11	11	299	300	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Poulet, Nicolas	Summary for policymakers	11	11	299	300	Please specify the affirmation regarding the estimation of USD 1.738billion. Please detail the time frame/scale (and source of the number). This amount is given for a period from 1970 to 2017 but it is not written. Perhaps a number per year would make it clearer and would generate more impact to the readers. Remember that this figure is an underestimate, and that a distinction should be made between damage costs and management costs.	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Romero, José A.	Summary for policymakers	11	11	299	300	Write: "Global costs over the last 50 years of invasive alien species amount to USD 1,738 billion, ..."	Thank you, we have changed this figure and introduced it with more caution and explanations in the second order draft of the SPM
Government of France	Summary for policymakers	11	11	300	300	Add "billion per year" if relevant.	Thank you, we have changed this figure and introduced it with more caution and explanations in the second order draft of the SPM
Government of USA	Summary for policymakers	11	11	300	300	Give a timeframe for the US\$1,738 billion figure.	Thank you, we have changed this figure and introduced it with more caution and explanations
Evans, Thomas	Summary for policymakers	11	11	301	301	All these? Issues?	Thank you, we have reworded this sentence in the second order draft of the SPM
Government of Germany	Summary for policymakers	11	11	301	305	Proposal: We suggest to change the text as follows: "All these impacts on nature's contributions to people are driven mainly through reductions or losses in crop yields caused by insect pests, weeds or pathogens and associated diseases; through reductions or losses in livestock yields due to loss of forage resources, injury, and livestock disease; and through the loss of wild resources due to alien species invasions". Please also consider that yield, the mass of harvest crop product in a specific area, is influenced by several factors like technological, biological (diseases, insects, pests, weeds) and environmental factors. Biological invasion is only one of several factors influencing the yield.	Thank you, we have reworded this sentence in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of UK (Sarah Webster, Defra)	Summary for policymakers	11	11	301	305	Sentence is way too long.	Thank you, we have reworded this sentence in the second order draft of the SPM
Government of USA	Summary for policymakers	11	11	301	301	This is a confusing statement and seems exaggerated that all monetary impacts of invasive species are exclusively due to impacts on nature's contributions to people? E.g., Zebra mussels clogging intake pipes or invasive disease vectors that cause human death but otherwise don't affect ecosystems in a substantive way seem separate from nature's contributions to people	Thank you, we have reworded this sentence in the second order draft of the SPM
Nunes, Ana	Summary for policymakers	11	11	301	305	Just wondering if these costs don't also incorporate management costs of IAS. Do they really only refer to impacts?	Thank you, these are the overall costs
Evans, Thomas	Summary for policymakers	11	11	302	303	pathogens, and the associated diseases? Pathogens and associated diseases	Thank you, this has been deleted and the comment is no longer relevant
Evans, Thomas	Summary for policymakers	11	11	303	303	insert ; after associated diseases	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments - this is explained in the background
Evans, Thomas	Summary for policymakers	11	11	303	303	losses due to loss? (delete or losses)	Thank you, this has been deleted from the second order draft of the SPM and the comment is no longer relevant
Lieurance, Deah	Summary for policymakers	11	11	303	303	Reword "losses due to loss of forage" (loss and losses used 4 times in one long sentence)	Thank you, this has been deleted and the comment is no longer relevant
Nunes, Ana	Summary for policymakers	11	11	303	304	Suggest changing 'losses due to loss of forage resources' to e.g. 'losses due to deprivation of forage resources'	Thank you, this has been deleted from the second order draft of the SPM and the comment is no longer relevant
Furukawa, Takuya	Summary for policymakers	11	11	304	305	Only mammals? What about other vertebrates? Invasion of invertebrates such as insect pests may also cause loss of wild resources.	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Chile (Ministry of the Environment)	Summary for policymakers	11	11	304	305	The drafting is not clear. We suggest to re-draft and revise the concepts, looks like there is a mix among species and biomes. Specify if aquatic represent freshwater and marine.	Thank you, this sentence has been deleted and the comment is no longer relevant
Nunes, Ana	Summary for policymakers	11	11	304	305	Sentence sounds strange, because it mentions invasions by 2 taxa groups and then one ecosystem. This may be what the data shows, but plant and mammal invasions can also be aquatic invasions. Full stop missing at the end of the sentence.	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Chile (Ministry of the Environment)	Summary for policymakers	11	11	305	305	We suggest including freshwater and marine or the word that represent those.	Thank you, this sentence has been deleted and the comment is no longer relevant
Eckbo, Norith	Summary for policymakers	11	11	307	309	Unclear message due to the placement of the categorisation of "established but incomplete" at the end of the sentence, it may seem that the lack of data is 'established but incomplete' and not as a reason why the records of invasive alien species is "established but incomplete".	Thank you. This has been revised accordingly in the second order draft of the SPM
Government of Canada (Chakravarty, Bipasha)	Summary for policymakers	11	11	307	310	If the spread of IAS is driven by commercial activities like trade and transport, biodiversity loss and ecosystem degradation, what accounts for the large proportion of IAS in indigenous areas, islands etc.?	Thank you, land tenure and indigenous peoples' difficulties to access and manage their lands are also identified as drivers facilitating the invasions in these areas (see ch3)
Government of China	Summary for policymakers	11	11	307	314	The term “indigenous people and local communities” is not defined in Glossary. Generally, indigenous people introduce relatively fewer alien species both in terms of types and quantity, and correspondingly the number of alien invasive species introduced is relatively smaller. It is puzzling that the report said about 44% of globally invasive alien species is related to lands and waters of indigenous people and their communities, and came to the final conclusion that “the negative impact of alien species on the land status, natural contribution to mankind and friendly life quality in these areas is greater than the positive impact (determined)”. It is suggested that to add the explanation of “indigenous people and local communities” in Glossary.	Thank you. This term is defined in the IPBES core Glossary. The assessment glossary is complementary to the IPBES core glossary.
Government of Germany	Summary for policymakers	11	11	307	307	Proposal: Please be careful to provide exact numbers. Exact numbers indicate a knowledge we do not have in reality; generating scientific evidence is a very dynamic process.	Thank you, but this assessment provides an evaluation of the available evidence to this date
Government of Germany	Summary for policymakers	11	11	308	308	Proposal: We suggest to change the text as follows: "...although data are largely lacking for some of these regions..."	Thank you. This has been clarified in the second order draft of the SPM
Grossart, Hans-Peter	Summary for policymakers	11	11	308	308	In #5: "... data are largely lacking for these regions" which regions do you refer to? Unclear...	Thank you. This has been clarified in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	11	11	309	314	previous counts of species have focussed on aliens, rather than invasives. Here it would help the reader if the result, rather than the statistic, was provided: The proportion of alien species identified as invasive is higher on indigenous than on other lands. The geographic breakdown should not be highlighted, in particular because the overall pattern is not discussed in the SPM and so there is no point of comparison. Similarly, the pattern of positive and negative impacts is the same as in point 1 above, so the line-of-sight on line 253 should add 4.6 and Box 4.15 to give equal weight to different knowledge systems.	Thank you, we have clarified this point
Government of Germany	Summary for policymakers	11	11	309	310	Clarification needed: It is difficult to read the Summary, because sometimes numbers are stated for "Alien Species" which are completely different from "Invasive Alien Species". Which data bases are used: The Global Invasive SpeciesDatabase (www.iuengisd.org) or the Global Register of Introduced and InvasiveAlien Species (www.griis.org)? Each time you give exact numbers it is suggested to refer to a specific data base.	Thank you, the difference is explained in the preamble, and in Chapter 2
Government of Germany	Summary for policymakers	11	11	309	310	Clarification needed: This statement could be interpreted to mean that indigenous peoples' land and water management practices are conducive to the spread of IAS. Please consider whether any rewording is needed. Furthermore, the indicated proportion of 44% seems inaccurate. As key message A states, about 10% of all alien species are invasive, which would be around 3900. If more than half of this estimate has been recorded in these specific areas, the percentage would be above 50%. Please consider to provide a confidence level on the proportion of IAS in areas managed by IPLC.	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Mexico (Koleff, Patricia)	Summary for policymakers	11	11	311	312	Box 2.8 not available, but recent literature seems to highlight other regions. Number of IAS on US and UE are large, see https://www.nature.com/articles/ncomms14435	Thank you, the box number has been revised in the second order draft of the SPM
Atchison, Jennifer	Summary for policymakers	11	11	312	312	Spelling error - <i>bit</i> should be but	Thank you, this has been addressed in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Germany	Summary for policymakers	11	11	312	312	Proposal: You might want to replace "bit" by "but".	Thank you, this has been addressed in the second order draft of the SPM
Lieurance, Deah	Summary for policymakers	11	11	312	312	Typo "bit" should be "but"	Thank you, we have corrected this in the second order draft of the SPM
Brooks, Thomas	Summary for policymakers	11	11	313	313	Add "and waters" to read "lands and waters"	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Germany	Summary for policymakers	11	11	313	313	Proposal: We suggest to change the text as follows: "...provoke significantly more negative, than positive impacts..."	Thank you, this paragraph has been revised in the second order draft, following other comments
Government of UK (Sarah Webster, Defra)	Summary for policymakers	11	11	313	313	"more negative than positive" repeats line 269	Thank you, this paragraph has been revised accordingly in the second order draft of the SPM
Tassin, Jacques	Summary for policymakers	11	11	313	313	more negative than positive' dos not make sense. Which is the common unit which would make possible to compare positive and negative impact and, how can we provicide such an algebric assessment?	Thank you, this paragraph has been revised accordingly in the second order draft of the SPM
Kamal Kumar Rai	Summary for policymakers	11	11	314	314	Case studies here should include IPLCs best practices based on ILK. Also, IPLCs views and future impacts must be considered.	Thank you, case studies are available in the chapters and also in the dialogue workshop reports held in support of this assessment
Brooks, Thomas	Summary for policymakers	11	11	316	320	The sentence on Lines 278-282 (Page 10) seems to duplicate A6 - perhaps delete?	Thank you, we have reduced the overlaps in the second order draft of the SPM
Collas, Marc	Summary for policymakers	11	11	316	320	Key message 6. This is a quite important and it should be better developed. We understand that there are not enough studies on the connexion between drivers + IAS; but perhaps this should be made more evident in the text.	Thank you, this paragraph has been revised accordingly in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	11	11	316	320	this is covered in point 3 (278-282)	Thank you, we have removed the overlaps in the second order draft of the SPM
Government of France	Summary for policymakers	11	11	316	320	Key message 6. This is a quite important and it should be better developed. We understand that there are not enough studies on the connexion between drivers + IAS; but perhaps this should be made more evident in the text.	Thank you, this paragraph has been revised accordingly in the second order draft of the SPM
Government of Mexico	Summary for policymakers	11	11	316	320	This paragraph seems to duplicate the information in lines 278-280.	Thank you, we have reduced the overlaps in the second order draft of the SPM
Lieurance, Deah	Summary for policymakers	11	11	316	320	Point 6 here has been mentioned above and perhaps should be moved up closer to point 3 or merged with #3	Thank you, we have reduced the overlaps in the second order draft of the SPM
Diaz, Sandra	Summary for policymakers	11	11	318	318	replace exccrated with exacerbated	Thank you, this has been addressed in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	11	11	318	318	execrated?!	Thank you, this paragraph has been revised accordingly in the second order draft of the SPM
Government of Chile (Ministry of the Environment)	Summary for policymakers	11	11	318	320	We suggest adding at the end of the phrase: "particularly in islands"	Thank you, but this is not supporter by the evidence
Government of Germany	Summary for policymakers	11	11	318	318	Proposal: You might want to replace "execrated" by "exacerbated".	Thank you, this has been addressed in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	11	11	318	318	is "exacerbated" meant instead of "execrated"?	Thank you, this has been addressed in the second order draft of the SPM.
Government of Netherlands (Groenewoud, H. E.)	Summary for policymakers	11	11	318	318	"occurred or" some words are missing here	Thank you, this paragraph has been revised accordingly
Government of UK (Mortimer, Diana)	Summary for policymakers	11	11	318	318	do you mean 'exacerbated' rather than 'execrated'?	Thank you, this has been addressed in the second order draft of the SPM.
Government of UK (Sarah Webster, Defra)	Summary for policymakers	11	11	318	319	The point about the interaction with climate change is repeated many times - please just describe this interaction once and well.	Thank you, we have removed the overlaps in the second order draft of the SPM
Henk, Groenewoud	Summary for policymakers	11	11	318	318	"occurred or" some words are missing here	Thank you, this paragraph has been revised accordingly
Government of Germany	Summary for policymakers	11	11	319	320	Proposal: We suggest to change the text as follows: "...pollution or other anthropogenic disturbances..."	Thank you. This is now in para 2 of the second order draft of the SPM
Diaz, Sandra	Summary for policymakers	11	11	320	320	replace disturbances with other disturbances [pollution and land use changes ARE disturbances	Thank you, this has been rephrased
Government of Belgium	Summary for policymakers	11	11	320	320	Add also overexploitation of wildlife (e.g. fishery)	Thank you, we may not cite them all in the second order draft of the SPM
Government of Australia	Summary for policymakers	11	11	322	322	Replace "societal and environmental factors" with "societal, institutional and environmental factors"	Thank you, this has been rephrased in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	11	11	322	324	this conclusion is not warranted. The complexity is real, and creates real management challenges, but it does not follow that a broad range of options is needed - it does suggest that there are many possible management targets. Rephrasing in such a way would allow elements relating to Chap 6 to be moved into a different sentence, and reduce the number of elements included in the line of sight to a tractable number.	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	11	11	325	325	"span" rather than "spans". The meaning of this sentence is unclear in our view, especially the second part.	Thank you, this has been revised accordingly in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	11	11	326	327	reference to novel environments seems out of place here. What is the "they" that delivers services?	Thank you, this has been rephrased in the second order draft of the SPM
Government of Germany	Summary for policymakers	11	11	326	326	Proposal: We suggest mentioning species adaptation in this context seems unnecessary (... "adapting to novel environments" ...). You might want to remove it.	Thank you, this has been rephrased in the second order draft of the SPM
Diaz, Sandra	Summary for policymakers	11	11	327	327	replace "deliver the services to society" with "provide contributions to people" or "provide benefits to people" or "provide benefits to societies" in order to be consistent with the IPBES conceptual framework and your own terminology in the previous sections	Thank you, we have revised the second order draft of the SPM accordingly
Government of France	Summary for policymakers	11	11	327	327	Instead of "how they deliver the services to society", we suggest to write "how they contribute to human well-being", to be more coherent with IPBES conceptual framework	Thank you, but the IPBES conceptual framework actually encourages us to use "good quality of life", not human wellbeing
Grossart, Hans-Peter	Summary for policymakers	11	11	330	335	Please highlight the importance of the ecological/biological context, i.e. the ability to invade largely depends on the present communities and biological interactions. If you have many open niches, invasion is usually facilitated and the likelihood that it takes place is increased!	Thank you, this has been emphasized elsewhere in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	11	11	331	332	repetitive with other parts of the text and not needed here	Thank you, we have removed overlaps in the second order draft of the SPM, though some repetitions are sometimes necessary
Furukawa, Takuya	Summary for policymakers	11	11	333	338	Please provide confidence levels of these statements.	Thank you, this has been corrected in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	11	11	334	338	this is a good example of stepwise logic and crisp language that supports understanding by non-experts.	Thank you for your comment
Government of France	Summary for policymakers	11	11	334	336	Perhaps also stress that often invasive alien species were not known before they have been introduced: "unknown unknowns"	Thank you, this is clarified in the preamble and in section A of the second order draft of the SPM
Government of USA	Summary for policymakers	11	11	334	336	"One of the outcomes of this environmental and societal complexity is that it is difficult to predict how likely species are to invade and what the outcomes of an invasion might be." Rather than the constant mantra of "Climate change will exacerbate invasive species" exhibited throughout the document. This sentence is a more accurate statement of the impact of climate on invasive species. Climate change will likely decrease opportunities or abilities for some species to invade and exacerbate others -- depending on the species.	Thank you, we have revised the second order draft of the SPM in line with this comment
Government of USA	Summary for policymakers	11	11	334	336	But don't we have frameworks to help us predict which species might become invasive? E.g. https://onlinelibrary.wiley.com/doi/full/10.1111/j.1472-4642.2008.00521.x . It might be helpful to provide some assessment of which species tend to become invasive, if the evidence supports it.	Thank you, we do, please see chapter 5
Jactel, Hervé	Summary for policymakers	11	11	334	336	Perhaps also stress that often invasive alien species were not known before they have been introduced: "unknown unknowns"	Thank you, we emphasize this point in a paragraph on lags (section B) of the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	11	11	338	341	This sentence has the same problems as the opening sentence of the para. The complexity means that a broad array of responses can be used, but it does not mean that a broad array is needed, and given our limited ability to manage IAS to date, it is hard to understand how a statement on the effectiveness of the broad-array-plus-strategy approach can be made with high confidence. Note also that strategy is completely ineffective without implementation, the goal is to not to manage uncertainty, and the goal is to reduce impacts rather than risks from IAS.	Thank you, we have revised the second order draft of the SPM in line with this comment
Government of Germany	Summary for policymakers	11	11	338	340	Proposal: We suggest to change the text as follows: "A broad array of response options integrated in a long-term strategy are most effective to manage the uncertainty and reduce the risks posed by invasive alien species".	Thank you, this part of the sentence has been deleted from the second order draft of the SPM and the comment is no longer relevant.
Evans, Thomas	Summary for policymakers	11	11	339	339	jointly effective? needed?	Thank you. Authors think 'jointly effective' is needed because we want to emphasise that multiple responses need to be implemented jointly to reduce risks - implementing just one or some is not effective
Evans, Thomas	Summary for policymakers	11	11	339	339	strategies	Thank you, this part of the sentence has been deleted and the comment is no longer relevant.
Evans, Thomas	Summary for policymakers	11	11	340	340	last letter of species is italicised	Thank you, this has been corrected in the second order draft of the SPM
Government of Australia	Summary for policymakers	11	11	344	344	language in this chapter is quite dense and scientific specific - is this designed for the target audience?	Thank you, we have completely reworded the paragraph on knowledge gaps and made it easier to understand in the second order draft
Government of USA	Summary for policymakers	12	12	263	263	It is unclear what "margins" means in this context.	Thank you, this has now been deleted from the second order draft of the SPM
Fagot, Cédric	Summary for policymakers	12	12	341	343	Figure 2. It should make it clearer that these are simple examples; and not the species that cause the most damages.	Thank you, we have revised the figure accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	12	12	341	343	Figure 2. It should make it clearer that these are simple examples; and not the species that cause the most damages.	Thank you, we have revised the figure accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	12	12	341	343	Figure 2. The message that this figure passes is that we should stop immediately all the IAS because it is the main reason responsible for the extinction of the species. The figure should be more clear about the interactions between the drivers (e.g. IAS + Land Use change).	Thank you, but this figure is about the impacts, not the drivers
Government of France	Summary for policymakers	12	12	341	343	Figure 2. We find 1.7 trillion on the figure; and the text you use 1,738 billion. It would make it easier to understand if the SPM uses the same way of representing the estimations (e.g. trillions) for both cases.	Thank you, we have harmonized this figure across the document in the second order draft of the SPM
Government of Mexico (Koleff, Patricia)	Summary for policymakers	12	12	341	342	Figure SPM.2. Include sources of information. If islands are separated number might change. Maps shows different areas, while most extinctions have occurred on islands.	Thank you, we have mentioned the sources (Chapter sections) in the caption
Meslier, Violaine	Summary for policymakers	12	12	341	343	Figure 2. It would be good to have the numbers regarding the amount of IAS in different taxa (eg. plants, mammals, birds; insects, etc.) to show the sub-estimation on some taxa.	Thank you, this is the focus of Figure SPM3 (now 4): Global patterns and trends in alien species
Poulet, Nicolas	Summary for policymakers	12	12	341	343	Figure 2. The message that this figure passes is that we should stop immediately all the IAS because it is the main reason responsible for the extinction of the species. The figure should be more clear about the interactions between the drivers (e.g. IAS + Land Use change).	Thank you, but this figure is about the impacts, not the drivers
Poulet, Nicolas	Summary for policymakers	12	12	341	343	Figure 2. We find 1.7 trillion on the figure; and the text you use 1,738 billion. It would make it easier to understand if the SPM uses the same way of representing the estimations (e.g. trillions) for both cases.	Thank you, we have harmonized this figure across the document in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Asmervik, Ingvald Fonn	Summary for policymakers	12	12	342	343	Figure SPM 2: Consider adding an example from Northern or Central Europe to the figure. Suggestion from Norway: Picea sitchensis is a species that is considered to have economic benefits and convenient ecosystem services (climate change mitigation), but at the same time is a serious threat to red listed species and nature types because of its invasiveness. It has colonized entire islands along the coast of Norway.	Thank you, examples have been carefully chosen to represent different types of impacts, in different regions across different taxa. The figure will become too crowded if too many examples are added
Bortolus, Alejandro	Summary for policymakers	12	12	342	342	Figure SPM.2. (map) This kind of Figure is commonly used by the media (news, social media, etc), without context other than the figure caption, to communicate news and advances made by IPBES. My concern with this figure in particular is that it shows large subcontinents/regions (ej. South America or the continental Asia) without examples. Although I know this is a schematic/sinthetic view of the problem which must remain simple and cannot include all examples, I still think that regions as big as South America or continental Asia should be linked to a representative example. Also, please note that only one example refers to marine bioinvasions, which leads to an intuitive underestimation of the problem in marine realms worldwide. At least one marine exaple should be add in this figure. Perhaps, you can add a marine example for South America/continental Asia and solve both problems at once. The european Green crab Carcinus maenas, the Pacific acorn barnacle Balanus glandula, the Pacific oyster Crassostrea gigas, the algae Undaria pinnatifida, or the Atlantic smooth cordgrass Spartina alterniflora are good emblematic cases you could use. It is a fact that Figures are usually shared massively, rapidly and out of context. I think it is possible to keep simplicity in the figure while also including one or two examples more, in order to prevent misleading conclusions.	Thank you, we have revised the examples to ensure regional balance and also balance in the type of impact and taxa
Brooks, Thomas	Summary for policymakers	12	12	342	342	Fig SPM2 is useful. For the three "columns" (extinctions, economic costs, quality of life) it would be appropriate and valuable to add a citation to the key data source, in the form of "based on data from XXX".	Thank you, we have mentioned the sources (Chapter sections) in the caption
Collas, Marc	Summary for policymakers	12	12	342	343	Figure 2. Example on Nile Perch is a controversial example since it can start a general discussion on geo-political factors.	Thank you but the Nile Perch is a seminal example of uninformed introduction gone terribly wrong. Deleting it will diminish the scientific veracity of our work
Eckbo, Norith	Summary for policymakers	12	12	342	343	Figure SPM 2: Consider adding an example of an alien invasive species from Central Europe or Northern Europe, in Fig SPM.2. For example king crab and sitka spruce.	Thank you, examples have been carefully chosen to represent different types of impacts, in different regions across different taxa. The figure will become too crowded if too many examples are added
Evans, Thomas	Summary for policymakers	12	12	342	342	Fig. SPM 2. Very nice, but no mammal or bird examples, or examples from all of Asia, South America or Western Europe. However, this may be a space issue and it's not the end of the world. You could have example boxes above the map though. I guess you want examples of major impacts to people and wildlife so the following three examples might be too minor. Ruddy duck hybridising with the globally threatened White headed duck in Spain (an impact that has been managed through eradication of the ruddy duck population, but nevertheless you could state the ruddy duck threatened the existence of the White headed duck): MUÑOZ-FUENTES, V., VILÀ, C., GREEN, A.J., NEGRO, J.J. and SORENSON, M.D. (2007), Hybridization between white-headed ducks and introduced ruddy ducks in Spain. Molecular Ecology, 16: 629-638. https://doi.org/10.1111/j.1365-294X.2006.03170.x The impacts of the Indian mongoose on islands in Croatia: Barun, A., Simberloff, D. and Budinski, I. (2010), Impact of the small Indian mongoose on native amphibians and reptiles of the Adriatic islands, Croatia. Animal Conservation, 13: 549-555. https://doi.org/10.1111/j.1469-1795.2010.00374.x Or the impacts of the mogoose on many native species including the Amami rabbit on Japanese islands: Watari, Y., Takatsuki, S. & Miyashita, T. Effects of exotic mongoose (Herpestes javanicus) on the native fauna of Amami-Oshima Island, southern Japan, estimated by distribution patterns along the historical gradient of mongoose invasion. Biol Invasions 10, 7 (2008). https://doi.org/10.1007/s10530-007-9100-6	Thank you very much, we have changed the examples but need to rely on examples from the chapters
Fagot, Cédric	Summary for policymakers	12	12	342	343	Figure SPM 2: Add in the middle of the figure : Examples of IAS	Thank you, we have revised the figure accordingly in the second order draft of the SPM
Government of Argentina	Summary for policymakers	12	12	342	342	Figure SPM 2: The color of the Malvinas Islands is different form the color of South America. We request to paint them on the same color of the South American continent.	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Australia	Summary for policymakers	12	12	342	343	Figure SPM.2 states "\$1.7 trillion" damage, but throughout the text \$1.738 billion (not trillion) was mentioned.	Thank you, we have harmonized this figure across the document in the second order draft of the SPM
Government of Belgium	Summary for policymakers	12	12	342	342	Figure SPM 2: Maybe Nile perch and sea walnuts are not the best examples as they are a bit controversial. Cichlid fish extinction and collapse of anchovy fishery may be primarily caused by eutrophication and overfishing rather than IAS development (see e.g. Gücü et al 2017 and Outa et al 2020).	Thank you, we have removed sea walnuts but the Nile Perch is a seminal example of uninformed introduction gone terribly wrong. Deleting it will diminish the scientific veracity of our work
Government of Belgium	Summary for policymakers	12	12	342	342	Figure SPM 2: What does "freedom of choice" mean? Add the definition in glossary.	Thank you, constituents of well-being are introduced in Chapter 1 and 4.
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	12	12	342	342	Figure SPM 2: The 44% and the bargraph in the bottom left cannot be supported with the information in Box 4.8, as those findings are strongly dominated by island species and readily observable species. Broad statements need to be supported by comprehensive evidence; if this is not available, the statemetns need to be narrowed to what is known. Costs should be "known costs"	Thank you, in the second order draft of the SPM, we have removed the 44% from the extinctions box as it apparently led to misinterpretation and confusion.
Government of Chile (Ministry of the Environment)	Summary for policymakers	12	12	342	343	Figure SPM. 2: The title of the figure does not help to understand the figure. We suggest breaking in parts: part a) part b) and part c) to help understand the frame and context.	Thank you, we have revised the caption to address this comment in the second order draft of the SPM
Government of Chile (Ministry of the Environment)	Summary for policymakers	12	12	342	343	Figure SPM.2: It is not clear if the "Cumulative Cost IAS" is talking about economic loss because invasive species, or the cost of managing invasive species.	Thank you, this has now been clarified in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Chile (Ministry of the Environment)	Summary for policymakers	12	12	342	343	Figure SPM.2: It is not clear what are the negative impacts of Quality of life. We suggest adding a specific example or data. For example, impact on women, costs, or others.	Thank you. We have examples on the map above and in the chapter 4
Government of Chile (Ministry of the Environment)	Summary for policymakers	12	12	342	343	Figure SPM.2: The text is not enough to explain the figure. We suggest adding more information or context.	Thank you, we have revised the caption to address this comment
Government of Chile (Ministry of the Environment)	Summary for policymakers	12	12	342	343	Figure SPM.2: We suggest specifying that the information is about "mainland", because when talking about islands the values are much higher.	Thank you, this data is global
Government of Chile (Ministry of the Environment)	Summary for policymakers	12	12	342	343	Figure SPM.2: We think it would be valuable to have a timescale for the figure (the last 20 or 100 years for example). We also suggest declaring if data or values are global, and if the data is global, we suggest specifying with an * the regional variation.	Thank you, we have revised this figure and now it hopefully addresses the reviewer's concern
Government of Chile (Ministry of the Environment)	Summary for policymakers	12	12	342	343	Figure SPM.2: Chile also has some examples in economic value of invasive species management that can be included: https://especies-exoticas.mma.gob.cl/wp-content/uploads/2018/12/1.-LIBRO-Valoracion-economica-EEI-FINAL.pdf	Thank you, this examples has been sent to the relevant chapter in the second order draft of the SPM
Government of France	Summary for policymakers	12	12	342	342	Figure SPM 2 (histogram of costs by taxa) : It's not vey clear whether the costs are cumulated over the last 50 years?	Thank you, this has now been clarified (and changed to annual costs) in the second order draft of the SPM
Government of France	Summary for policymakers	12	12	342	342	Figure SPM 2: Add in the middle of the figure : Examples of IAS	Thank you, we have revised the figure accordingly in the second order draft of the SPM
Government of Germany	Summary for policymakers	12	12	342	342	Clarification needed: Figure SPM 2: We feel the number of 44% of extinctions where invasive alien species are the main driver might not be realistic. The IPBES global assessment report ranked IAS fifth among direct drivers of change in nature with the largest relative global impacts, after changes in land and sea use, direct exploitation of organisms, climate change, and pollution. See also Blackburn et al. 2019: "We compared how frequently alien and native species have been implicated as drivers of recent extinctions in a comprehensive global database, the 2017 International Union for Conservation of Nature (IUCN) Red List of Threatened Species. Alien species were considered to be a contributing cause of 25% of plant extinctions and 33% of animal extinctions, whereas native species were implicated in less than 5% and 3% of plant and animal extinctions, respectively."	Thank you, in the second order draft of the SPM, we have removed the 44% from the extinctions box as it apparently led to misinterpretation and confusion.
Government of Germany	Summary for policymakers	12	12	342	342	Proposal: Please be careful with the example of the Sea Walnut in Figure SPM.2 because this was a temporary problem. According to the data of the acoustic surveys in the waters of the former USSR in the period from 1980 to 1988, the average biomass of the Black Sea anchovy aggregations was 309,000 tons, and the biomass of the Azov anchovy, 169,000 tons. Since 1988, the situation of these stocks have dramatically changed, populations have decreased considerably. In all evidence, this was caused by excessive anchovy captures by USSR and Turkey. The intrusion of a jellyfish, Mnemiopsis, was an additional important negative factor. However, the anchovy biomass near the Georgian coast increased up to 165,000 tons after the Mnemiopsis outbreak had passed its peak in winter 1991-92.	Thank you, we have removed this example
Government of Mexico (Saad Alvarado, Laura)	Summary for policymakers	12	12	342	343	Figure SPM.2 add 2017 to Cost (USD); although it is indicated on the left side, it must be included on the Y axis in the bars of cumulative economic costs; and USD (2017 value) in circle \$1.7 trillion.	Thank you, we have revised this graph and the comment is no longer relevant
Government of Mexico (Saad Alvarado, Laura)	Summary for policymakers	12	15	342	372	Figure SPM.2. Consider position of extension of the problem Figure SPM.2 and then point 8 of the information gaps is located. Table SPM.1: Cross-chapter synthesis of knowledge gaps.	Thank you, the table has been moved.
Government of Mexico	Summary for policymakers	12	12	342	342	Figure SPM.2. In the graph for impacts of IAS on quality of life indicators, it is not clear what "freedom of choice" is referring to.	Thank you, constituents of well-being are introduced in Chapter 1 and 4.
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	12	12	342	342	Figure SPM.2. Chytrid fungus – how many extinctions were caused/contributed to by IAS?	Thank you, this is indicated in Chapter 4.
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	12	12	342	342	Figure SPM.2. Economic cost. We disagree with the use of this figure. We also note that no reference is made to 'at least' 1.7 trillion here.	Thank you, we have revised this figure in the second order draft of the SPM
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	12	12	342	342	Figure SPM.2. Quality of life. It is not really clear what this measure is.	Thank you, this follows the IPBES conceptual framework
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	12	12	342	342	Figure SPM.2. This infographic is excellent.	Thank you for the positive feedback, much appreciated
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	12	12	342	342	Figure SPM.2. Nile perch – how many cyclid species became extinct?	Thank you, this information is not available/relevant here
Government of UK (Mortimer, Diana)	Summary for policymakers	12	12	342	342	Figure SPM 2: the scale for culmulative costs should run from small to large as is conventional.	Thank you, this has now been clarified in the figure, but also in the main text and in the chapters of the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of USA	Summary for policymakers	12	12	342	342	Figure SPM 2: Overall, an effective figure. Under the cumulative economic costs figure, is that the cumulative economic costs of invasive members of each of those taxonomic groups OR is it the costs to each of those taxonomic groups from invasive species? Please clarify. Text in the map examples is small and difficult to read. In the bottom right panel, what does freedom of choice mean?	Thank you, this has now been clarified in the figure, but also in the main text and in the chapters of the second order draft of the SPM
Jactel, Hervé	Summary for policymakers	12	12	342	342	Figure SPM 2 (histogram of costs by taxa) : It's not very clear whether the costs are cumulated over the last 50 years?	Thank you, this has now been clarified (and changed to annual costs) in the second order draft of the SPM
Karayannis, Theofanis	Summary for policymakers	12	12	342	342	Figure SPM.2: While the document acknowledges the bias of information/attention towards terrestrial, this Figure SPM.2 merely perpetuates that bias by showing only one marine example out of the six examples of IAS. It would be better if this was more balanced with half of the examples being marine (of which there are many to choose from).	Thank you, we have restored the balance, but also selected freshwater species
Lang, Iris	Summary for policymakers	12	12	342	343	Figure SPM 2 : The notion of "freedom of choice" is not clear. As for the Y axis "Number of impacts". Furthermore, impacts on biodiversity could be emphasized on this figure.	Thank you, constituents of well-being are introduced in Chapter 1 and 4.
Setsaas, Trine Hay	Summary for policymakers	12	12	342	342	Figure SPM2: The figure says "economic cost US dollar 1.7 trillion". However, the text indicates "billions"...	Thank you, this has been corrected in the second order draft of the SPM
Takahashi, Yasuo	Summary for policymakers	12	12	342	342	Bottom-right diagram in Figure SPM.2: I could not find this figure (85 %) in the background chapter (perhaps 4.3.2?). The chapter says that 84 % of recorded impacts (cases) have directions, and 76 % among these cases report negative direction. Moreover, if the diagram presents the number of cases reported, I suspect the validity of using this metric to compare negative and positive impacts of IAS. If these studies focus on critical negative impacts, the number of the reports of negative impacts, including multiple studies on the impacts of the same IAS on the same species/ecosystems, could be higher than that of positive or negligible impacts. I would suggest authors to consider better metrics, e.g., number IAS causing only negative impacts, only positive impacts (perhaps this is not the case) or both positive and negative impacts.	Thank you, the methodology is available in Chapter 4.
Taki, Hisatomo	Summary for policymakers	12	12	342	342	Figure SPM.2: In the map part of the figure, the characters look blurred or may be too small.	Thank you, this has been improved in the second order draft of the SPM
van Delft, Jeroen	Summary for policymakers	12	12	342	342	Figure SMP.2: Graph in the lower left corner of this figure. IAS are presented as relatively the most important driver for extinctions ("Percentage of extinctions for which the driver is listed "). Might it be possible that the other causes in this graph can far less clearly be linked to concrete extinctions than IAS, leading to less listed drivers for extinctions? This figure is in my opinion a very strong, visual and explicit one. It might become one of the most widely used ones in the media after publication. If the importance of IAS is partly caused by research bias (underestimation of the influence of causes other than IAS) and can be debated, this might become a problem in communication.	Thank you, this is further developed in the background and in the chapter 4
Collas, Marc	Summary for policymakers	12	12	343	343	Figure 2. If we add the microbiote (virus, bacterias) on this figure, taking the pandemic context, we would have more expression on the economic graphic. Not sure if we have enough literature.	Thank you, viruses are not considered in this assessment, but are acknowledged
Collas, Marc	Summary for policymakers	12	12	343	343	Figure 2. The third graph is hard to understand. There should be a clear distinction between the impacts on biodiversity and the impacts on humans.	Thank you, the third graph is only on the impacts on good quality of life (humans)
Diaz, Sandra	Summary for policymakers	12	12	343	343	Fig. SPM 2. Nice figure indeed. Some comments: panel on drivers of extinctions: this ranking seems to be in obvious disagreement with the results of the global assessment (see GA SPM), how do explain the differences? If there is no contradiction, please briefly clarify in the legend or axes of graph). Panel on economic costs: it should say "taxonomic group" or "taxon", not "taxon group". In the maps, there is no need to say that the fire ant is "imported"; presumably all the examples are?	Thank you, we have now clarified this statement and figure in the second order draft of the SPM
Government of Australia	Summary for policymakers	12	12	343	343	change Cenchrus ciliaris to Buffel Grass and suggest change text to contributing to the collapse of arid zone ecosystems, impact of fire and access to cultural sites	Thank you, in the second order draft of the SPM, we have changed the name but unfortunately the description needs to remain short.
Government of France	Summary for policymakers	12	12	343	343	Figure 2. The third graph is hard to understand. There should be a clear distinction between the impacts on biodiversity and the impacts on humans.	Thank you, the third graph is only on the impacts on good quality of life (humans)
Government of France	Summary for policymakers	12	12	343	343	Figure 2. What "the number of impacts" mean? Do we have a list? Shouldn't it be measured by the "size/power of the impact"?	Thank you, please refer to Chapter 4 to read the methodology
Government of Germany	Summary for policymakers	12	12	343	343	Clarification needed: Figure SPM.2 portrays 3 critical figures: If almost half of all extinctions (44%!) are caused by IAS, we wonder why this extremely critical and important finding hasn't been raised earlier in the key messages part. See also additional comment below. Please ensure that the economic costs are expressed consistently through the SPM - before, it was referred to as 1.7 billion, in this figure as 1.7 trillion. This is confusing and opens up for misunderstandings. Please also explain, what these costs comprise and what time period they refer to (e.g. annual vs. cumulative costs for the years x-y). The third figure on impacts on quality of life is very difficult to grasp and might be interpreted/ understood in different ways. The way this figure is visualized might suggest that quality of life decreases by 85% - however, in fact it means 85% of all impacts of IAS on quality of life were considered as negative. Please explain what the figure actually means and to what it does refer. Regarding the IAS examples in the map: The example from Australia needs further explanation - why does Cenchrus ciliaris restrict access to culturally important sites? Please be careful with the example of the Sea Walnut/Black Sea (see additional comment below). When considering the bar charts, we suggest to focus on the different cost components rather than the taxon group. It would be extremely valuable to see what these cumulative economic costs comprise. The bar chart on the impacts on quality of life is not very insightful. How can the impact be measured in percentage? What does it mean that there are 200 "material and immaterial assets"? Due to the presentation at this very aggregated level, this might not provide any meaningful insight. Please also add the sources of the bar charts. Furthermore, it would be extremely helpful to elaborate more on the concept of "quality of life" for this assessment (see also other chapters).	Thank you, the figure and SPM have been revised accordingly, and methodology is available in Chapter 4 of the second order draft
Grossart, Hans- Peter	Summary for policymakers	12	12	343	343	Figure SPM 2:I wonder that the costs for fungi/microbes is so low in comparison considering many fungal food pathogens and bacterial antibiotics resistance pathogens. I would like to see how all these numbers have been calculated! In my opinion not much is known about invasive microbes (see your table SPM.1), but it doesn't mean that they are not existent and in my opinion some can cause substantial harm and hence costs!!!	Thank you, this has been removed from the second order draft of the SPM but the methodology is still available in chapter 4
Hofstra, Gerrit	Summary for policymakers	12	12	343	343	Figure SPM 2: According to the IUCN red list database 35% of species either extinct or extinct in the wild were driven by IAS. Mostly not as the only driver	Thank you, this has been clarified in the second order draft of the SPM
Jacques, Cecile	Summary for policymakers	12	12	343	343	Figure 2. What "the number of impacts" mean? Do we have a list? Shouldn't it be measured by the "size/power of the impact"?	Thank you, please refer to Chapter 4 to read the methodology

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Lieurance, Deah	Summary for policymakers	12	12	343	343	Figure SPM2 is exceptional. You have examples of Quality of life and Extinctions on the map. Could you put a specific example of an economic cost? For example there are some estimates that feral hogs cost between 1.5 and 2.5 billion US annually or Zebra mussels inflicting \$5 bil economic impact in the Great Lakes over a decade. An example like this would make sense with the color coding on the map matching the top portion of the figure. And this is a super minor comment, but the line for the red fire ant should originate from the Southeastern US.	Thank you. We have changed the examples, but as the map already focuses on economic costs, we didn't follow the suggestions to add an example of economic costs.
Tassin, Jacques	Summary for policymakers	12	12	343	343	Figure SPM2: the reader cannot know which are the respective parts of plant and animal alien invaive species which are involved in extinctions.	Thank you, but this level of detail can unfortunately not be included in the figure (please refer to chapter 4 for more details)
Government of Estonia (Otsus, Merit)	Summary for policymakers	13	13	0	0	The look into knowledge gaps is thorough, but could come to some final summary what to conclude of it. How to deal with uncertainties is given later, p 23, but could be briefly introduced already here. E.g. how to deal the consider the situation of many uncertainties and how to be precautionary?	Thank you, we have moved the knowledge gaps to Section D of the second order draft of the SPM
Government of Estonia (Otsus, Merit)	Summary for policymakers	13	15	0	0	We note that the very thorough overview of knowledge gaps (of global patterns, impacts, etc) is given afore the description of known global patterns of invasions and their impacts. It might be useful to consider structuring the document vice versa, first describe the known global patterns and impacts and thenafter reveal the knowledge gaps. Readers could want to know first what is known. Otherwise, reading first that the knowledge is very poor may weaken the following message(s) about what is really known about IAS.	Thank you, we have revised the second order draft of the SPM accordingly
Taki, Hisatomo	Summary for policymakers	13	15	272	273	Table SPM. 1: In the table, is there a need to mention communication gaps including among differennt languages?	Thank you, these are only the main gaps, but please refer to the chapters for more information
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	13	13	344	370	This point could be shortened, relying on the contents of Table SPM.1	Thank you, the draft has been revised accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	13	15	344	373	I think the "knowledge gaps" Table should include the lack in restoration / conservation framework in order to improve local to large scale management of IAS. Knowledge gaps should also include the need to develop new alternative methods to the use of chemicals (see https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-2664.13656)	Thank you, this has been partly addressed, noting that the knowledge gaps table only presents main gaps. For more details, please see the chapters
Government of Germany	Summary for policymakers	13	15	344	373	Proposal and clarification required: This para on knowledge gaps highlights extremely important areas for further research. So we welcome this para and in particular Table SPM.1 summarizing a cross-chapter synthesis of knowledge gaps very much. However, we are concerned that those significant and widespread knowledge gaps might question the deterministic and definitive way of formulating many statements and numbers. To allow for more consistency throughout the SPM we suggest to add a column to the table that reflects the current state of the knowledge on IAS since there have been tremendous research efforts and significant advances in the past. This might also help to differentiate more exactly between what we know already and what further aspects need to be researched.	Thank you, we have reworted this paragraph and insisted on the statement that despite these knowledge gaps, we can take action and have strong evidence
Evans, Thomas	Summary for policymakers	13	13	346	346	I'm not sure what 'Identifying a consistent global assessment' means.	Thank you, this sentence has been deleted from the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	13	13	346	347	repetitive, suggest deletion.	Thank you, the draft has been revised accordingly in the second order draft of the SPM
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	13	13	349	349	is it over-representatin of terrestrial ecosystems, or under-representation of the others?	Thank you, this sentence has been deleted from the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	13	13	350	352	line of sight is missing	Thank you, the draft has been revised accordingly in the second order draft of the SPM
Collas, Marc	Summary for policymakers	13	13	353	357	Key message 8. The list for each country is very difficult because it is dynamic. There are always new species to add. Also, there is a time delay between identifying the species and adding in the official list, therefore the gaps. This is important information and should be clearer in the paragraph.	Thank you, the draft has been revised accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	13	13	353	357	Key message 8. The list for each country is very difficult because it is dynamic. There are always new species to add. Also, there is a time delay between identifying the species and adding in the official list, therefore the gaps. This is important information and should be clearer in the paragraph.	Thank you, the draft has been revised accordingly in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	13	13	355	356	Data deficiencies are particularly high for fungi and microbes, as well as invertebrates.	Thank you, the draft has been revised accordingly in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	13	13	360	362	this is confusing - if we know that tropical invasions are underestimated in tropical biomes, a conclusion that temperate biomes are more affected is simply wrong.	Thank you, we have reworted this paragraph in the second order draft of the SPM and insisted on the statement that despite these knowledge gaps, we can take action and have strong evidence
Evans, Thomas	Summary for policymakers	13	13	366	370	Long paragraph - the last section of which doesn't make sense. Suggest new line at 367 after pathogens. 'We also lack data on...'. However from 'ongoing collection at line 368 this paragraph doesn't make sense.	Thank you, this paragraph has been substantially revised in the second order draft of the SPM, following this comment
Furukawa, Takuya	Summary for policymakers	13	13	366	370	The sentence is too long and difficult to understand.	Thank you, this paragraph has been substantially revised in the second order draft of the SPM following this comment
Government of Germany	Summary for policymakers	13	13	366	370	Proposal: This sentence is much too long and is difficult to understand. You might want to split it into two or three sentences.	Thank you, this paragraph has been substantially revised in the second order draft of the SPM, following this comment
Government of Norway (Vik, Nina)	Summary for policymakers	13	13	366	370	Could this sentence be formulated a bit clearer? It is a bit difficult to grasp what the factors + the main message is here	Thank you, this sentence has been deleted from the second order draft of the SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	13	13	366	370	very long sentence. It might be possible to convert this to bullet points or simply refer to the table SPM1	Thank you, this paragraph has been substantially revised in the second order draft of the SPM following this comment
Nunes, Ana	Summary for policymakers	13	13	366	370	Very long and unclear sentence, suggest rephrasing.	Thank you, this paragraph has been substantially revised in the second order draft following this comment

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Pan, Xubin	Summary for policymakers	13	13	366	370	Divided into two sentences?	Thank you, this sentence has been deleted from the second order draft of the SPM
Bliss, Cebuan	Summary for policymakers	13	15	372	373	Table SPM 1: Knowledge gaps on social dimensions are missing e.g. governance, social acceptability of IAS mitigation measures/mangement, IAS welfare	Thank you, this table only presents the main gaps identified throughout the chapters
Collas, Marc	Summary for policymakers	13	15	372	373	Table SPM 1: Knowledge gaps table: Context of global incertitude in relation of climat change and how it affects the spreading of IAS.	Thank you, this has been revised accordingly in the second order draft of the SPM
Collas, Marc	Summary for policymakers	13	15	372	373	Table SPM 1: Knowledge gaps table: In the Potential Policy Approaches line we can add the bureaucratic work and how this slow process affects the timing of all the IAS research and the management actions.	Thank you but this table presents knowledge and data gaps, not gaps of implementation
Collas, Marc	Summary for policymakers	13	15	372	373	Table SPM 1: Knowledge gaps table. Sanitary aspects (and pandemics) related to IAS? We should have a specific point for this important (and timely) subject.	Thank you, this table only presents the main gaps identified throughout the chapters
Dommanget, Fanny	Summary for policymakers	13	15	372	373	Table SPM 1: I think the "knowledge gaps" Table should include the lack in restoration / conservation framework in order to improve local to large scale management of IAS. Knowledge gaps should also include the need to develop new alternative methods to the use of chemicals (see https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-2664.13656)	Thank you, this has been revised accordingly in the second order draft of noting that this table only presents major gaps. Please refer to the chapters for more information
Eckbo, Norith	Summary for policymakers	13	15	372	373	Table SPM 1: Consider visualizing some of the information in table SPM 1, for example knowledge gaps on regional scale, biomes and taxa.	Thank you, we have added a bit more details to this table -- with visual elements (colours) in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	13	13	372	372	Table SPM.1. Really nice summary. Remove full stop after first point. Same for point in the table at the top of page 15. Big Data in Caps? - second to last row.	Thank you, in the second order draft of the SPM, we have made substantial changes to the table, including your comments
Government of Canada (Alexander, Steven)	Summary for policymakers	13	15	372	373	Table SPM.1 - last bullet on page 14 doesn't quite make sense "Data on the impacts of socioeconomic factors on the access to knowledge on invasive alience species and the gathering of data."	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	13	13	372	372	Table SPM 1: suggest dividing data on status and trends from data on drivers. Standardized terminology is not a data gap. In fact, the assessment is likely to go some way toward filling what is a communications gaps	Thank you, we have restructured the table, following the broad categories (inspired by the Global Assessment and other activities led by the IPBES Knowledge and data Task force)
Government of Chile (Ministry of the Environment)	Summary for policymakers	13	15	372	373	Table SPM.1: We suggest repeating the title of the table along the shifts to help the reading.	Thank you, done
Government of France	Summary for policymakers	13	13	372	372	Table SPM.1 : Very interesting review of the state of the art and all the work remaining to lower so many gaps in knowledge.	Thank you for your feedback.
Government of Germany	Summary for policymakers	13	15	372	373	Proposal regarding Table SPM.1/ Regional gaps: As reference is made to sub-chapter 3.3 the data gaps could be further specified as data gaps on "direct" drivers.	Thank you, this has been harmonized in the second order draft of the SPM
Government of Mexico (Saad Alvarado, Laura)	Summary for policymakers	13	15	372	373	Table SPM.1: Consider reducing this information in the summary for policymakers: Table SPM.1: Cross-chapter synthesis of knowledge gaps.	Thank you, the table was moved to annexes to avoid breaking the flow of the second order draft of the SPM
Government of Mexico	Summary for policymakers	13	15	372	373	Table SPM.1: This box could be included at the end of the SPM in a specific section related to knowledge gaps. Including it in the middle of the background could distract policy makers from the technical information related directly to key messages.	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Netherlands (Kreiken, Bob)	Summary for policymakers	13	15	372	373	Table SPM 1: Citizen science could be given a bigger role in the SPM, especially with regard to arguments about the need for partnership with communities.	Thank you, this has been revised accordingly in the second order draft of the SPM
Lang, Iris	Summary for policymakers	13	15	372	373	Table SPM 1: Knowledge gaps table (Scenarios). Sugestion of literature to review: 2018 Modéliser et prédire les invasions biologiques - Alice Fournier. (https://tel.archives-ouvertes.fr/tel-01826647/file/68910_FOURNIER_2018_diffusion.pdf)	Thank you, findings on scenarios and models are based on a thorough literature review (please refer to Chapter 1 for more information)
Participants of ILK dialogue workshop (Guadalupe Yesenia Hernández Márquez)	Summary for policymakers	13	13	372	372	Table SPM 1. Another gap is the capacity building on early warning about the IAS impacts to indigenous people's lands.	Thank you, this table only presents the main gaps identified throughout the chapters
Peterson, Garry	Summary for policymakers	13	13	372	373	Table SPM. 1: This table is great. It would be good to link each of these points to exact spots in the chapters that support these statements. It would be good to also include a bit more about what is missing in models and scenarios in "Integrated scenarios and modelling studies" especially what is needed for policy and transformation in chapter 6.	Thank you, this has been revised accordingly
Razafiaron, Fanirisoa	Summary for policymakers	13	15	372	373	Table SPM 1: Gaps in many of the areas mentioned are really a difficulty for research and for the management of invasive alien species. I agree that there is a gap on invasive alien species inventories in countries where research is less funded, such as the case of Madagascar (my country), one of the developing countries, but part of the 17 hotspot countries in the world, which deserves protection against biological invasion. The knowledge of the local people questioned also had another sad gap. Many do not know whether a plant species is invasive or not, until the species is already causing significant damage.	Thank you for your comment. We have added more information on challenges to close the gaps in the second order draft of the SPM
Bortolus, Alejandro	Summary for policymakers	14	14	372	373	Table SPM.1. Either here in this Table or somewhere else, it is critical to call the attention on the possibility of protecting different ecosystems as if they were native, when in fact they are not. I suggest adding here, in this part of the Table ("Integrated Scenarios and modelling studies"): Improve scenarios and models that help to recognize pre-existing native ecosystems by unveiling overlooked and/or ignored introductions of invasive species (the "ecological mirage hypothesis" already mentioned in Chapter {2})	Thank you, we have reconsidered the phrasing of all the gaps in the second order draft of the SPM
Fagot, Cédric	Summary for policymakers	14	14	372	373	Table SPM 1: Add brackish : Marine and brackish biomes	Thank you, the gaps here are the ones identified by the chapters through their literature searches
Government of France	Summary for policymakers	14	14	372	373	Table SPM 1: Add brackish : Marine and brackish biomes	Thank you, the gaps here are the ones identified by the chapters through their literature searches
Government of Germany	Summary for policymakers	14	14	372	372	Proposal regarding Table SPM.1/ Nature's contributions to people-related gaps: We suggest the gaps to be formulated specifically in relation to IAS.	Thank you, done

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Germany	Summary for policymakers	14	14	372	372	Proposal regarding Table SPM.1/ Taxonomic gaps: We feel the selection is arbitrary. There are about 2 million invertebrates worldwide compared to less than 58.000 vertebrates. Please check.	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	14	15	372	373	Table SPM1 is an example of something useful in the report, which should be retained.	Thank you for your comment.
Government of USA	Summary for policymakers	14	14	372	373	Table SPM1: Potential policy approaches box: In the first bullet, not sure what "in an environmental governance context" adds to the sentence. Don't we want invasive species management mainstreamed so that it's not just environmental? Also unclear what "Data on the impacts of socioeconomic factors on the access to knowledge on invasive alien species and gathering of data" means.	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of USA	Summary for policymakers	14	14	372	373	Table SPM1: What are units of analysis? Can a different word be used here?	Thank you, units of analysis are introduced in Chapter 1 and also used in previous IPBES assessments
Taki, Hisatomo	Summary for policymakers	14	14	372	373	Table SPM. 1: About "Regional gaps", does it need to mention the Arctic and Antarctic regions in this case?	Thank you, this has been edited in the second order draft of the SPM
Taki, Hisatomo	Summary for policymakers	14	14	372	373	Table SPM. 1: About "Integrated scenarios and modelling studies", is there a need to describe local scenarios?	Thank you, please refer to the chapter for more information
Atchison, Jennifer	Summary for policymakers	15	15	372	373	Table SPM 1: All methods for Indigenous peoples should be inclusive and culturally respectful, as well as systematic. There are social justice implications in terms of using and integrating Indigenous knowledge to manage IS.	Thank you, we agree with the reviewer. This table presents knowledge and data gaps, not gaps of implementation
Atchison, Jennifer	Summary for policymakers	15	15	372	373	Table SPM 1: Data collection for Indigenous peoples and local communities should also address land owned by Indigenous people.	Thank you, this point is further developed elsewhere and has been deleted from the table in the second order draft of the SPM
Government of Germany	Summary for policymakers	15	15	372	372	Proposal regarding Table SPM.1/ Technical development: We suggest to refer directly to existing data bases like The Global Invasive Species Database (www.iucngisd.org) or the Global Register of Introduced and Invasive Alien Species (www.griis.org)	Thank you, more information is available in Chapter 6
Kamal Kumar Rai	Summary for policymakers	15	15	372	372	Table SPM. 1: Knowledge gaps on IPLCs, need to include: Establish a mechanism of engagement ensuring the self-determination, collective collaboration, Principles of Free, Prior and Informed Consent, full and effective participation, and EIA and socio-economic and cultural impacts assessment.	Thank you but this table presents knowledge and data gaps, not gaps of implementation
Kamal Kumar Rai	Summary for policymakers	15	15	372	372	Table SPM. 1: Knowledge gaps on IPLCs, need to include: Need to recognise, respect and incorporate or promote indigenous sciences and values	Thank you, but authors have made a clear distinction between knowledge gaps and lack of action
Government of Canada (Fraleigh, Brad)	Summary for policymakers	15	15	373	373	Table SPM. 1, under Indigenous Peoples and Local Communities. Add two bullets: (1) "tools and methodologies to allow IPLCs to share their own data and knowledge about IAS with non-IPLCs in ways that respect the rights and customs of the IPLCs", and (2) tools and methodologies to integrate data and knowledge about IAS from IPLCs and non-IPLCs"	Thank you for this comment - this section has been edited substantially in the second order draft of the SPM
Government of Canada (Fraleigh, Brad)	Summary for policymakers	15	15	373	373	Table SPM.1, under Potential Policy Approaches, last bullet: "case studies" and "best practices" are very different and both are important. They should each have their own bullet.	Thank you, there were substantial changes to this table, and the comment is no longer relevant
Grossart, Hans-Peter	Summary for policymakers	15	15	373	373	Table SPM.1, you may add to "technical Development" the hypotheses networks, e.g. https://refubium.fu-berlin.de/bitstream/handle/fub188/26081/Enders_Drawing_2018.pdf?sequence=1&isAllowed=y and https://www.cabi.org/ISC/ebook/20183119350	Thank you, this table only presents the main gaps identified throughout the chapters
Government of Argentina	Summary for policymakers	16	16	376	379	Why does the first historical reference goes back only 50 years? As far as we know, the impact of invasive alien species in our continent was intensified since colonization. In our view, this paragraph should acknowledge the role of colonization in the expansion of invasive alien species worldwide.	Thank you for your comment. Indeed, alien species have been introduced since centuries, which is stated in the preceding sentence. The year 1970 has been just selected as a reference year to describe recent trends quantitatively.
Government of France	Summary for policymakers	16	16	376	399	Assuming that invasive alien species will follow the trend of alien species (only introduced on line 386-390) - the link between invasive alien species and alien species should be made sooner in the paragraph and THEN present the trend on alien species.	Thank you, we have addressed this comment by adding an introductory part outlining important definitions and terms, and by simplifying the language in the second order draft of the SPM
Pellens, Roseli	Summary for policymakers	16	16	376	399	Assuming that invasive alien species will follow the trend of alien species (only introduced on line 386-390) - the link between invasive alien species and alien species should be made sooner in the paragraph and THEN present the trend on alien species.	Thank you, we have addressed this comment by adding an introductory part outlining important definitions and terms, and by simplifying the language in the second order draft of the SPM
Bortolus, Alejandro	Summary for policymakers	16	16	377	379	Check grammar for clarity.	Thank you, we have checked the English throughout in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	16	16	377	377	Suggest no sign of "levelling off" as easier to understand and more informative (numbers could level off due to effective control of introductions, without saturation, and this is in fact the most desirable state)	Thank you for your comment. The text has been revised according to the suggestion.
Diaz, Sandra	Summary for policymakers	16	16	378	379	This step rise in the number of AIS in the past few decades, is because indeed there have been more invasions, and/or simply more attention is being paid to them than in the past?	Thank you for your comment. Both, increased numbers of introduction and rising awareness played important roles, but unfortunately we cannot quantify their relative contribution. However, sensitivity analyses suggest that it is very unlikely that there trends are due to rising awareness only. The influence of increasing awareness and sampling is reflected in the following sentences. We rephrased these sentences to clarify this.
Fagot, Cédric	Summary for policymakers	16	16	380	380	and high difference between taxa in relation to their easy visible effect (link to SPM3)	Thank you for the comment. We revised the sentence to consider more aspects of uncertainty including differences among species groups in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	16	16	382	384	this is redundant with steepest rises in numbers, in lines 377-378 - suggest combining the sentences	Thank you for your comment. We carefully checked the sentences, but believe that all sentences provide new and relevant information. We therefore would like to keep the sentences.
Government of UK (Mortimer, Diana)	Summary for policymakers	16	16	382	384	this is an important point and would be good in the key messages	Thank you, this is included in key messages from section A of the second order draft of the SPM
Government of USA	Summary for policymakers	16	16	383	383	What does "in most recent times" mean specifically?	Thank you for your comment. Highest values were reached around the year 2000-2005. Trends in later years are highly affected by lags in recording. We would therefore prefer to leave the text as it is.

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Chile (Ministry of the Environment)	Summary for policymakers	16	16	384	384	The phrase is not clear. We suggest clarifying if it is: "every other day" or "every second of the day".	Thank you, this sentence has been modified in the second order draft of the SPM
Government of Germany	Summary for policymakers	16	16	385	385	Proposal: Please consider substituting "across all taxonomic groups" with "across all analysed taxonomic groups"	Thank you for your comment. The text has been revised in the second order draft of SPM as suggested.
Eckbo, Norith	Summary for policymakers	16	16	386	390	This sentence is difficult to grasp the meaning of. Consider rewrite.	Thank you, we have removed part of this sentence to clarify and reduce overlaps in the second order draft of the SPM
Government of Germany	Summary for policymakers	16	16	386	388	Need for clarification: What is the defining feature for IAS as a subset of alien species? Having a negative impact or being able to spread or both? It is suggested to be more precise here using the above given definition on IAS. Furthermore, the insertion in brackets (L387-L388) is repetitive (see, e.g. L264) - please consider deleting it.	Thank you, this has been clarified in the introductory section
Government of UK (Mortimer, Diana)	Summary for policymakers	16	16	386	390	It is not clear what this sentence is referring to.	Thank you, we have removed part of this sentence to clarify and reduce overlaps in the second order draft of the SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	16	16	386	386	Line 386 explains that "realm" means terrestrial, freshwater and marine, but this explanation is needed the first time the word "realm" appears which is at line 256	Thank you, we have changed realms to ecosystems in the second order draft of the SPM for more clarity.
Government of Mexico	Summary for policymakers	16	16	387	388	The fact that at least 10% of alien species have been identified to be invasive somewhere, is already mentioned in A2 of the Background section.	Thank you for your comment. The statement has been removed to avoid confusion in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	16	16	389	389	I don't understand this statistic - 18 newly recorded?	Thank you, we have removed part of this sentence to clarify and reduce overlaps in the second order draft of the SPM
Government of USA	Summary for policymakers	16	16	389	390	Not quite sure what this means; recently, new records of IAS have been at 18 species/year?	Thank you, we have removed part of this sentence to clarify and reduce overlaps in the second order draft of the SPM.
Eckbo, Norith	Summary for policymakers	16	16	390	392	How is this compared to interaction with other drivers of ecosystem change? Consider adding information about this also, with a future perspective. Would need a follow-up in the main chapter.	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Estonia (Otsus, Merit)	Summary for policymakers	16	16	393	393	What is meant by "economically active regions"? Could be rephrased somehow	Thank you, the draft has been revised accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	16	16	393	393	They are not only economically active regions but also the most populated.	Thank you. This is only partly true as area of high population densities are also found in parts of Asia and Africa, with less recorded alien species.
Jactel, Hervé	Summary for policymakers	16	16	393	393	They are not only economically active regions but also the most populated.	Thank you for your comment. This is only partly true as area of high population densities are also found in parts of Asia and Africa, with less recorded alien species.
Government of Australia	Summary for policymakers	16	16	395	395	Suggest worth mentioning some examples of the calculated benefit that these countermeasures do provide (to balance the otherwise negative commentary on the countermeasures not doing enough).	Thank you, we have done that in the chapters too
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	16	16	395	397	This is an important point - really important to policy makers, because fundamentally, this is the major policy direction to be decided - they can either control introductions or adapt to invasions. I would suggest a variant on this sentence as the bold point for B6, emphasizing that successes are possible and progress has been made (which is well established - New Zealand is remarkably successful, for example, and international phytosanitary measures have also had positive results), but current efforts are not sufficient to reduce rates of establishment.	Thank you, successes have been emphasized in the second order draft of the SPM (in other paragraphs)
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	16	16	397	397	'....these countermeasures are largely insufficient.....' This is a key point that is lost at the bottom of a long paragraph and does not even feature in the 'Key messages' section.	Thank you, this is now included in B5. of the second order draft of the SPM
Evans, Thomas	Summary for policymakers	16	16	398	398	introduction(s)	Thank you, this has been edited accordingly in the second order draft of the SPM
Government of USA	Summary for policymakers	16	16	399	399	What does unseen mean here? Unknown futures, or novel communities?	Thank you, we have changed this word to "unforeseen" in the second order draft of the SPM
Albert, Arnaud	Summary for policymakers	17	17	400	400	Figure SPM.3 : The choice of the figure to begin in 1500 is surprising. Of course, this date is often used for flora to distinguish between neophytes and archaeophytes. If we start in 1800 it will be more readable but in this case it will be a pity not to consider the archaeophytes.	Thank you, this better reflects the data and content of chapter 2
Bortolus, Alejandro	Summary for policymakers	17	17	400	407	Figure SPM.3. The reference of colors doesn't match the map entirely. For instance, the scale of blues (marine taxa) seems incomplete. The light blue dominating most oceans and seas, is lighter than the lightest blue in the scale on the left (even the assigned to "0"). The color gray assigned to "No data" seems to appear only on coastal waters, which is odd. Many alien marine taxa were indeed reported for coastal areas like Northern Chile, Peru, Antarctica and many of the austral islands like Malvinas (here marked as "no data").	Thank you. This has now been corrected in the second order draft of the SPM
Curd, Amélia	Summary for policymakers	17	17	400	400	Figure SPM. 3 - A: Regarding the terrestrial environment: There is a possibility of bias from developed countries as they have more research and observation capacity due to strong academic activity and concern about alien invasive species. Is there any possibility of highlighting or addressing possible biases here? Similarly for temperate and tropical countries. Could the data be used to make another map showing the differences in the level of observations and information between geographical areas? There is a need to standardise the data with the number of publications/data OR to explain in the legend the raw data.	Thank you, we are now showing the data gaps in the second order draft of the SPM
Curd, Amélia	Summary for policymakers	17	17	400	400	Figure SPM. 3 - B : Molluscs, algae are missing. Crustaceans: important to label freshwater AND marine. Need to repeat which ecosystem they refer too.	Thank you, we have added them to the second order draft of the SPM
Dommanget, Fanny	Summary for policymakers	17	17	400	400	Figure SPM. 3 - A: Regarding the terrestrial environment: There is a possibility of bias from developed countries as they have more research and observation capacity due to strong academic activity and concern about alien invasive species. Is there any possibility of highlighting or addressing possible biases here? Similarly for temperate and tropical countries. Could the data be used to make another map showing the differences in the level of observations and information between geographical areas? There is a need to standardise the data with the number of publications/data OR to explain in the legend the raw data.	Thank you, we are now showing the data gaps in the second order draft of the SPM

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Dommanget, Fanny	Summary for policymakers	17	17	400	400	Figure SPM. 3 - B : Molluscs, algae are missing. Crustaceans: important to label freshwater AND marine. Need to repeat which ecosystem they refer too.	Thank you, we have added them to the second order draft of the SPM
Fagot, Cédric	Summary for policymakers	17	17	400	400	Figure SPM. 3 - B: There are biases in the amount of information on plants and insects - the legend needs to be completed on the level of knowledge of species	Thank you, we are now showing the data gaps. Also please see the table of knowledge gaps
Government of Belgium	Summary for policymakers	17	17	400	400	Figure SPM 3: Better to weight species number by country area in figure A (global distribution of alien taxa) because of strong size differences between countries.	Thank you, the figure has been updated in the second order draft
Government of Chile (Ministry of the Environment)	Summary for policymakers	17	17	400	405	Figure SPM. 3: We think it would be valuable to have a timescale for the figure. The timescale in B is the same that in A?	This is current trends
Government of France	Summary for policymakers	17	17	400	400	Figure SPM. 3 - A: Regarding the terrestrial environment: There is a possibility of bias from developed countries as they have more research and observation capacity due to strong academic activity and concern about alien invasive species. Is there any possibility of highlighting or addressing possible biases here? Similarly for temperate and tropical countries. Could the data be used to make another map showing the differences in the level of observations and information between geographical areas? There is a need to standardise the data with the number of publications/data OR to explain in the legend the raw data.	Thank you, we are now showing the data gaps in the second order draft of the SPM
Government of France	Summary for policymakers	17	17	400	400	Figure SPM. 3 - B: There are biases in the amount of information on plants and insects - the legend needs to be completed on the level of knowledge of species	Thank you, we are now showing the data gaps. Also please see the table of knowledge gaps
Government of Germany	Summary for policymakers	17	17	400	405	Need for clarification: Why does Figure SPM.3 consider alien but not invasive alien species? We feel the world map might be not very meaningful because the map shows only the efforts in alien species research, but not the real distribution. You might want to explain this in the figure's text. Furthermore, we were wondering why the year 2015 was chosen as end year (cf. L405)? This might make the information look somewhat outdated. Please try to get updated data.	Thank you, the background text and Chapter 2 now provide more information on this point in the second order draft of SPM
Government of Japan	Summary for policymakers	17	17	400	405	Figure SPM.3 shows the growth of the number of alien species. Although such a figure is meaningful to some extent (particularly in initial stage), we are not sure if such metrics can accurately describe the real trends of invasions of invasive alien species. Assuming that some limited number of species can potentially become (invasive) alien species, such growth of the number of (invasive) alien species may reach saturation somewhere. Even after such saturation, possibly some (invasive) alien species invade into certain countries many times, and such repetitive invasions/introductions may matter when it comes to evaluating impacts of (invasive) alien species. Please note that even the agreed indicator to monitor Aichi Biodiversity Target 9 was "Trends in the numbers of invasive alien species introduction events" but not "Trends in the number of invasive alien species". Figure 9.2. (Trend of the cumulative number of invasive alien species worldwide) of Global Biodiversity Outlook5 is also showing limited growth of number of invasive alien species in recent years, while GBO5 also cited a comprehensive study which found no evidence of slowing in the rate of invasion. Hence, the figure which shows the trends in the number of invasions/introductions by alien species should be added.	Thank you. The backgrounds text and chapter 2 provide more context as of why this figure focuses on alien species.
Government of Japan (Takehara, Mari)	Summary for policymakers	17	17	400	405	The draft SPM describes that data gaps exist in many regions. It appears that the countries that have high number of alien terrestrial and freshwater taxa in Figure SPM.3 correspond to those countries that have few data gaps in the Figure 2.5 in Chapter 2. In other words, the countries with many data gaps could also harbor many alien species. Thus, we are wondering if the data on the number of alien species should and could be corrected by taking into account the inter-country variance in available data on (or data gaps of) alien species. Such corrections by considering survey efforts may be possible if raw data are available. Otherwise, at least a figure which shows data gaps (eg. Figure 2.5) should be included in the SPM to guide readers' accurate understanding on Figure SPM.3.	Thank you, we have added a map with data gaps, as suggested in the second order draft of the SPM
Government of Mexico (Koleff, Patricia)	Summary for policymakers	17	17	400	401	Figure SPM 3. CONABIO has the most comprehensive data of IAS in Mexico and the numbers shown in the map are very high for Mexico. Please review source of information	Thank you, we have revised the figure - please see caption for more information on the data
Government of USA	Summary for policymakers	17	17	400	400	Figure SPM.3: Compared to map in previous figure, it looks like some of the places with the highest numbers of alien species have some of the lowest costs. Is this correct?	Thank you, these are only the documented impacts and also not all alien species are invasive alien species. Maps have been updated
Karayannis, Theofanis	Summary for policymakers	17	17	400	400	Figure SPM.3: It is recognised (including in various points within this Assessment) that the Mediterranean Sea is the most invaded sea in the world, however this Figure SPM.3 does not show any alien marine species for the Mediterranean, which gives the exact opposite impression. I am sure that such information for the Mediterranean must exist in relevant databases as it's not an under-researched sea in this regard (and in fact this is reflected in Figure 2.4).	Thank you, we have revised the figure in the second order draft of the SPM- please see caption for more information on the data
Massé, Cécile	Summary for policymakers	17	17	400	400	Figure SPM. 3 - A: Regarding the terrestrial environment: There is a possibility of bias from developed countries as they have more research and observation capacity due to strong academic activity and concern about alien invasive species. Is there any possibility of highlighting or addressing possible biases here? Similarly for temperate and tropical countries. Could the data be used to make another map showing the differences in the level of observations and information between geographical areas? There is a need to standardise the data with the number of publications/data OR to explain in the legend the raw data.	Thank you, we are now showing the data gaps in the second order draft of the SPM
Massé, Cécile	Summary for policymakers	17	17	400	400	Figure SPM. 3 - B : Molluscs, algae are missing. Crustaceans: important to label freshwater AND marine. Need to repeat which ecosystem they refer too.	Thank you, we have added them to the second order draft of the SPM
Meslier, Violaine	Summary for policymakers	17	17	400	400	Figure SPM. 3 - B : Molluscs, algae are missing. Crustaceans: important to label freshwater AND marine. Need to repeat which ecosystem they refer too.	Thank you, we have added them to the second order draft of the SPM
Pellens, Roseli	Summary for policymakers	17	17	400	400	Figure SPM. 3 - A: Regarding the terrestrial environment: There is a possibility of bias from developed countries as they have more research and observation capacity due to strong academic activity and concern about alien invasive species. Is there any possibility of highlighting or addressing possible biases here? Similarly for temperate and tropical countries. Could the data be used to make another map showing the differences in the level of observations and information between geographical areas? There is a need to standardise the data with the number of publications/data OR to explain in the legend the raw data.	Thank you, we are now showing the data gaps in the second order draft of the SPM
Pellens, Roseli	Summary for policymakers	17	17	400	400	Figure SPM. 3 - B : Molluscs, algae are missing. Crustaceans: important to label freshwater AND marine. Need to repeat which ecosystem they refer too.	Thank you, we have added them to the second order draft of the SPM

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Pellens, Roseli	Summary for policymakers	17	17	400	400	Figure SPM.3 Would it be possible to rescale the figure B? Most of the significant and informative trends in the IAS spread occurred after 1800, but here we can only notice this. If the figure is re-scaled to show more details after 1800, we would be able to establish fast comparisons between continents. It is important to keep the increase before the 1800s for vascular plants.	Thank you, this better reflects the data and content of chapter 2 in the second order draft of the SPM
Poulet, Nicolas	Summary for policymakers	17	17	400	400	Figure SPM. 3 - A: Regarding the terrestrial environment: There is a possibility of bias from developed countries as they have more research and observation capacity due to strong academic activity and concern about alien invasive species. Is there any possibility of highlighting or addressing possible biases here? Similarly for temperate and tropical countries. Could the data be used to make another map showing the differences in the level of observations and information between geographical areas? There is a need to standardise the data with the number of publications/data OR to explain in the legend the raw data.	Thank you, we are now showing the data gaps in the second order draft of the SPM
Stiger-Pouvreau, Valérie	Summary for policymakers	17	17	400	400	Figure SPM. 3 - A: Regarding the terrestrial environment: There is a possibility of bias from developed countries as they have more research and observation capacity due to strong academic activity and concern about alien invasive species. Is there any possibility of highlighting or addressing possible biases here? Similarly for temperate and tropical countries. Could the data be used to make another map showing the differences in the level of observations and information between geographical areas? There is a need to standardise the data with the number of publications/data OR to explain in the legend the raw data.	Thank you, we are now showing the data gaps in the second order draft of the SPM
Stiger-Pouvreau, Valérie	Summary for policymakers	17	17	400	400	Figure SPM. 3 - B : Molluscs, algae are missing. Crustaceans: important to label freshwater AND marine. Need to repeat which ecosystem they refer too.	Thank you, we have added them to the second order draft of the SPM
Government of Argentina	Summary for policymakers	17	17	401	401	Figure SPM 3: From this figure one can clearly establish high trends in the number of alien species across taxa way back from the 1970, and in particular with high increases since the industrial revolution and since the colonization. This should be reflected in the text	Thank you, the background text is now more aligned with this message in the second order draft of the SPM
EL Houdi, Khadija	Summary for policymakers	17	17	402	403	Figure SPM 3: "The total number of known alien taxa per country (terrestrial and freshwater) and marine ecoregion (marine) is indicated by colour separately" It would be helpful if a table with those data by country are enclosed in an annex	Thank you, kindly see the caption for the data source
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	17	17	402	403	Figure SPM 3: To provide consistent messaging with line 393-394, suggest A should be labelled as global distribution of "alien species records" or "known alien species." White then becomes a more intuitive "no known records" rather than "missing data" - insufficient data is a theme of the assessment, for all regions. As the records are at species level (mostly), it will also avoid confusion with the reuse of the word "taxa" for larger taxonomic groups in B.	Thank you, data gaps are now indicated and source is available in the caption
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	17	17	409	411	The grammar is important here. This sounds utterly hopeless - if we don't have enough effective countermeasures, why try? Suggest rephrasing: "Numbers of IAS and their impacts are expected to continue to rise unless additional countermeasures are undertaken and the effectiveness of existing countermeasures is improved." The following sentence could be deleted, moving directly to the sentence on BAU.	Thank you for your comment. We revised the sentence in the second order draft as suggested.
Government of Germany	Summary for policymakers	18	18	409	411	Proposal: Please check whether universality of this message holds (at global level) or if the message needs to be further differentiated/ contextualized.	Thank you for your comment. We carefully check the message and still believe that in general this message applies globally.
Setsaas, Trine Hay	Summary for policymakers	18	18	409	411	Could this sentence be included in Key message B1? It is a relevant point to underline there.	Thank you, this has been elevated to the key messages part in the second order draft of the SPM
Government of Germany	Summary for policymakers	18	18	412	412	Proposal: Please check, you might want to replace "alien species" by "invasive alien species".	Thank you, but this statement is valid for alien species
Asmervik, Ingvald Fonn	Summary for policymakers	18	18	413	414	Is it possible to say anything about the future economic costs of this scenario?	Thank you for your comment. Up to our knowledge there are no estimates about future economic costs.
Curd, Amélia	Summary for policymakers	18	18	413	416	The text presents 2 contradictory messages with one established but incomplete and the other well established. With this information it is difficult to get a clear idea of the message.	Thank you for your comment. We removed this sentence to avoid confusion in the second order draft of the SPM
Dommanget, Fanny	Summary for policymakers	18	18	413	416	It is difficult to understand what the "total number" stated here refers to. Is it for invasive alien species or for alien species? The document lacks precision on these aspects.	Thank you, we have clarified it in the second order draft
Dommanget, Fanny	Summary for policymakers	18	18	413	416	The text presents 2 contradictory messages with one established but incomplete and the other well established. With this information it is difficult to get a clear idea of the message.	Thank you for your comment. We removed this sentence to avoid confusion in the second order draft of the SPM
Eckbo, Norith	Summary for policymakers	18	18	413	414	It could be interesting to add estimates of future economic costs in this context. Would need follow-up in the main chapter.	Thank you for your comment. Up to our knowledge there are no estimates about future economic costs.
Government of Australia	Summary for policymakers	18	18	413	413	consider consider using the term 'business-as- usual' in summary for policy makers - it's a strong term	Thank you for your comment. We clarified now, what we mean by business-as-usual is in the second order draft of the SPM
Government of France	Summary for policymakers	18	18	413	416	It is difficult to understand what the "total number" stated here refers to. Is it for invasive alien species or for alien species? The document lacks precision on these aspects.	Thank you, we have clarified it in the second order draft of the SPM
Massé, Cécile	Summary for policymakers	18	18	413	416	The text presents 2 contradictory messages with one established but incomplete and the other well established. With this information it is difficult to get a clear idea of the message.	Thank you for your comment. We removed this sentence to avoid confusion in the second order draft of the SPM
Pellens, Roseli	Summary for policymakers	18	18	413	416	The text presents 2 contradictory messages with one established but incomplete and the other well established. With this information it is difficult to get a clear idea of the message.	Thank you for your comment. We removed this sentence to avoid confusion in the second order draft of the SPM
Stiger-Pouvreau, Valérie	Summary for policymakers	18	18	413	416	It is difficult to understand what the "total number" stated here refers to. Is it for invasive alien species or for alien species? The document lacks precision on these aspects.	Thank you, we have clarified it in the second order draft of the SPM
Stiger-Pouvreau, Valérie	Summary for policymakers	18	18	413	416	The text presents 2 contradictory messages with one established but incomplete and the other well established. With this information it is difficult to get a clear idea of the message.	Thank you for your comment. We removed this sentence to avoid confusion in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Albert, Arnaud	Summary for policymakers	18	18	414	414	"36%": This figure needs to be better referenced and explained in more detail, e.g. with a margin of error and which ecosystem it corresponds to, as in chapter 2 it is stated that there can be large variations and this is not reflected in the SPM.	Thank you for your comment. An error has not been calculated yet for this number. And it refers to all ecosystems and all regions.
Curd, Amélia	Summary for policymakers	18	18	414	414	"36%": This figure needs to be better referenced and explained in more detail, e.g. with a margin of error and which ecosystem it corresponds to, as in chapter 2 it is stated that there can be large variations and this is not reflected in the SPM.	Thank you for your comment. An error has not been calculated yet for this number. And it refers to all ecosystems and all regions.
Dommanget, Fanny	Summary for policymakers	18	18	414	414	"36%": This figure needs to be better referenced and explained in more detail, e.g. with a margin of error and which ecosystem it corresponds to, as in chapter 2 it is stated that there can be large variations and this is not reflected in the SPM.	Thank you for your comment. An error has not been calculated yet for this number. And it refers to all ecosystems and all regions.
Massé, Cécile	Summary for policymakers	18	18	414	414	"36%": This figure needs to be better referenced and explained in more detail, e.g. with a margin of error and which ecosystem it corresponds to, as in chapter 2 it is stated that there can be large variations and this is not reflected in the SPM.	Thank you for your comment. An error has not been calculated yet for this number. And it refers to all ecosystems and all regions.
Pellens, Roseli	Summary for policymakers	18	18	414	414	"36%": This figure needs to be better referenced and explained in more detail, e.g. with a margin of error and which ecosystem it corresponds to, as in chapter 2 it is stated that there can be large variations and this is not reflected in the SPM.	Thank you for your comment. An error has not been calculated yet for this number. And it refers to all ecosystems and all regions.
Stiger-Pouvreau, Valérie	Summary for policymakers	18	18	414	414	"36%": This figure needs to be better referenced and explained in more detail, e.g. with a margin of error and which ecosystem it corresponds to, as in chapter 2 it is stated that there can be large variations and this is not reflected in the SPM.	Thank you for your comment. An error has not been calculated yet for this number. And it refers to all ecosystems and all regions.
Brooks, Thomas	Summary for policymakers	18	18	419	419	Add a sentence around here to document the increasing extinction risk driven by IAS. Something like "The Red List Index, as the official UN Sustainable Development Goal indicator 15.5.1, reveals ongoing increases in the prevalence of species extinction risk driven by invasive alien species {4.3.1}."	Thank you, the SPM mentions that the presence and all the impacts of IAS will increase (which includes extinctions).
Evans, Thomas	Summary for policymakers	18	18	422	422	Personally I'm not keen on starting sentences with the word 'But'. Possible option: 'However, even without the introduction...'	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	18	18	422	423	This is a key point that without the introduction of new species existing alien species will continue to expand their ranges. What this DOES NOT say is that their impact will also grow.	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Germany	Summary for policymakers	18	18	423	424	Proposal: Considering the extent of the knowledge gaps, this is a very strong statement that IAS "will continue to expand their alien ranges ...". Perhaps you might want to rephrase this statement slightly. Please also consider to replace "alien ranges" by "geographical ranges".	Thank you for your comment. As suggested, we replaced "alien" by "geographic" in the second order draft of the SPM
Setsaas, Trine Hay	Summary for policymakers	18	18	424	427	Also an important point to explicitly make clear within the Key messages.	Thank you, this has been elevated to the key messages part
EL Houdi, Khadija	Summary for policymakers	18	18	427	427	Global joint efforts, between actors, governments,countries, international institutions, scientists,regions and communauties , are needed to "flatten the curve"	Thank you, we do not want to make the text longer but have added traceability statements
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	18	18	427	429	Could the line-of-sight point to chapter sections rather than the entire chapter? It is not my feeling that Chap 6 supports this point. While global joint efforts may be the the most efficient and effective option, there are actions that countries could take on their own.	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	18	19	431	468	Point 11 contains quite a bit of duplicative text, within the point and with other points. If this point is intended to support B2, it should focus clearly on human actions that lead to IAS, and avoid repeating findings on expected trends that are in point 10. The figure is effective in showing that economic drivers are important in transport and introduction, while land- and sea-use change is more important in later stages - this underpins material in C and provides important policy guidance that could be highlighted in the text. Point 13 also contains information on drivers - points 11 and 13 could be made adjacent in the document and duplicative material removed.	Thank you, there has been substantial revisions to the structure in the second order draft of the SPM, following this comment
Government of Germany	Summary for policymakers	18	18	431	431	Clarification needed: Might not some biological invasions also have been triggered by past human activities, but continue under current altered human activities?	Thank you, this has been clarified in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	18	18	433	437	These two sentences say very much the same thing, but with different lines of sight and different confidence. Lines 445-448 also overlap significantly.	Thank you, we have revised the paragraph to clarify its focus in the second order draft of the SPM
Government of Germany	Summary for policymakers	18	18	433	435	Proposal: This sentence seems to be incomplete. A verb might be missing.	Thank you, this sentence has been revised in the second order draft of the SPM
Pan, Xubin	Summary for policymakers	18	18	433	433	"establishment, and spread"	Thank you, this sentence has been revised and the comment is no longer relevant
Albert, Arnaud	Summary for policymakers	18	18	436	436	It is difficult to understand what the term "drivers" refers to - it should be remembered which drivers are included in this paragraph.	Thank you, this has been clarified in the introductory paragraph of the second order draft of the SPM
Fagot, Cédric	Summary for policymakers	18	18	436	436	It is difficult to understand what the term "drivers" refers to - it should be remembered which drivers are included in this paragraph.	Thank you, this has been clarified in the introductory paragraph of the second order draft of the SPM
Government of UK (Mortimer, Diana)	Summary for policymakers	18	18	436	436	need to qualify what types of 'driver'.	Thank you, this sentence has been revised and the comment is no longer relevant here but has been taken up in a different paragraph in the second order draft of the SPM
Maillard, Jean-François	Summary for policymakers	18	18	436	436	It is difficult to understand what the term "drivers" refers to - it should be remembered which drivers are included in this paragraph.	Thank you, this has been clarified in the introductory paragraph of the second order draft of the SPM
Meslier, Violaine	Summary for policymakers	18	18	436	436	It is difficult to understand what the term "drivers" refers to - it should be remembered which drivers are included in this paragraph.	Thank you, this has been clarified in the introductory paragraph of the second order draft of the SPM
Poulet, Nicolas	Summary for policymakers	18	18	436	436	It is difficult to understand what the term "drivers" refers to - it should be remembered which drivers are included in this paragraph.	Thank you, this has been clarified in the introductory paragraph of the second order draft of the SPM
Government of Germany	Summary for policymakers	18	18	443	443	Proposal: Please consider to change: "human migration" to "human migration by ship". Boat hulls are / were an important vector.	Thank you. We have chosen to include it in the section (added "e.g. on ships") of the second order draft of the SPM
Eckbo, Norith	Summary for policymakers	18	19	448	451	Explain what non-linear interactions means in this context. It is a technical term that may be confusing.	Thank you, this sentence has been revised accordingly in the second order draft of the SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	18	18	448	448	Established <u>but</u> incomplete	Thank you, this has been addressed in the second order draft of the SPM.
Evans, Thomas	Summary for policymakers	19	19	450	450	invasion (singular) scenarios?	Thank you, this sentence has been deleted in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Canada (Fraleigh, Brad)	Summary for policymakers	19	19	450	451	"... likely to lead to invasions scenarios never previously experienced (established but incomplete) {3.4, 3.6}" sounds like sheer speculation. It is not substantiated by Chap.3. The known invasion scenarios are bad enough without having to invent unknown new ones.	Thank you, this sentence has been deleted from the second order draft of the SPM
Government of Germany	Summary for policymakers	19	19	453	457	Proposal: Please consider to delete the sentence. Rationale: Extending the distribution of a species towards higher latitudes is a general phenomenon for native and alien species, this is not a specific issue for alien species.	Thank you, this sentence has been deleted accordingly from the second order draft of the SPM
Maillard, Jean- François	Summary for policymakers	19	19	454	454	Concerning trends in future scenarios: It would be useful to have more details on the drivers by 2050, e.g. on new modes of transport.	Thank you, more information has been added although it is difficult to predict
Curd, Amélia	Summary for policymakers	19	19	457	459	what about islands? The term "well-connected" and "high socio-economic activities" are not the best here because they don't take into account islands. The sentence should maybe made it clear to which geographical areas they refer to.	Thank you, we have restructured the second order draft of the SPM and now have given the appropriate attention to islands
Dommanget, Fanny	Summary for policymakers	19	19	457	459	"and high altitudes" should be added (see https://link.springer.com/article/10.1007/s00035-016-0172-8).	Thank you, this sentence has been deleted as it was too detailed for the SPM
Pellens, Roseli	Summary for policymakers	19	19	457	459	The way islands are presented in the SPM is not the right one - they should be presented first and not secondary as currently.	Thank you, we have restructured the SPM and now have given the appropriate attention to islands in the second order draft
Soubeyran, Yohann	Summary for policymakers	19	19	457	459	The way islands are presented in the SPM is not the right one - they should be presented first and not secondary as currently.	Thank you, we have reconsidered the focus on islands in the second order draft of the SPM
Soubeyran, Yohann	Summary for policymakers	19	19	457	459	what about islands? The term "well-connected" and "high socio-economic activities" are not the best here because they don't take into account islands. The sentence should maybe made it clear to which geographical areas they refer to.	Thank you, we have restructured the second order draft of the SPM and now have given the appropriate attention to islands
Government of Estonia (Otsus, Merit)	Summary for policymakers	19	19	458	458	What is meant by "regions with high socio-economic activity"? Could be rephrased somehow, it is not obvious what is meant.	Thank you, this has been rephrased, accordingly in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	19	19	460	460	The lack of indications of slowing? Delete?	Thank you, the paragraph has been significantly revised in the second order draft and now addresses this issues
Government of Germany	Summary for policymakers	19	19	462	464	Proposal: Please consider to modify the sentence as follows: "Biological invasions are facilitated, and their impacts exacerbated, when policies, governance practices and institutions do not explicitly deal with invasive alien species."	Thank you, the paragraph has been significantly revised and the comment is no longer relevant
Government of Mexico	Summary for policymakers	19	19	462	465	Adding some examples would better illustrate policy makers on which policies have facilitated or exacerbated invasions.	Thank you, in the second order draft of the SPM, we have revised for clarification.
Bortolus, Alejandro	Summary for policymakers	19	19	466	468	Figure SPM.4. This figure looks complete but confuse.	Thank you, this figure has been redesigned and is now easy to read and simpler in the second order draft of the SPM
Fagot, Cédric	Summary for policymakers	19	20	466	473	Fig SPM4 should be deleted- Not easy to read and too detailed for a summary	Thank you, this figure has been redesigned and is now easy to read and simpler in the second order draft of the SPM
Government of Germany	Summary for policymakers	19	20	466	473	Proposal regarding Figure SPM.4: While we acknowledge the value and significance of social sciences methods, we were still wondering whether the evidence for this scoring exercise is broad enough to be included in the SPM of this assessment. If the authors decide to keep this figure in the SPM, please give at least the total number of authors involved in the scoring exercise and refer to the name of this scientific method/approach. Furthermore, as the figure is not easy to grasp, we encourage to elaborate on the graphic presentation. It might also be helpful to simplify, e.g. by splitting content into more than one figure.	Thank you, we have simplified the figure and also developed a data management plan in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	19	19	466	473	Figure SPM.4 should be made larger, perhaps showing the legend below the figure. The figure caption should also be displayed on the same page as the figure if possible.	Thank you, this figure has been redesigned and is now easy to read and simpler in the second order draft of the SPM
Pellens, Roseli	Summary for policymakers	19	20	466	473	Figure SPM.4 : It would be useful to define the drivers clearly.	Thank you, they are now defined in the preamble
Albert, Arnaud	Summary for policymakers	19	19	467	467	Figure SPM 4: It is not sure whether the colours are suitable for colour blind people. This is a point to be taken into account for the final layout	Thank you, we have revised this figure and changes the colours in the second order draft
Brooks, Thomas	Summary for policymakers	19	19	467	468	Figure SPM.4: I like the intent of Fig SPM4, but the fact that it is wholly based on expert opinion perhaps means that it is not sufficiently robust to merit a place in the SPM. Also, what definitions were used for the different drivers - were these based on Salafsky et al. (2008 Conserv Biol)? What does the "biodiversity loss" class mean here?	Thank you, the methodology is documented and drivers are defined in Chapter 3 (taken from the IPBES conceptual framework)
Curd, Amélia	Summary for policymakers	19	19	467	467	Figure SPM.4: It is possible that there are biases in relation to the authors' areas of expertise (marine/terrestrial). It would be useful to indicate this in the legend so that it does not confuse the reader.	Thank you, the methodology is now clearly documented in the second order draft of the SPM
Fagot, Cédric	Summary for policymakers	19	19	467	467	Figure SPM 4: It is not sure whether the colours are suitable for colour blind people. This is a point to be taken into account for the final layout	Thank you, we have revised this figure and changes the colours in the second order draft
Government of Belgium	Summary for policymakers	19	19	467	468	Figure SPM 4: Difference between transport and introduction is unclear and should be explained in caption.	Thank you, this is now clarified in the preamble
Government of Mexico	Summary for policymakers	19	19	467	468	Figure SPM.4: While the idea to illustrate as many drivers as possible in a visual way is good, it seems like too much information, too crowded.	Thank you, this figure has been redesigned and is now easy to read and simpler in the second order draft of the SPM
Government of UK (Mortimer, Diana)	Summary for policymakers	19	19	467	478	Figure SPM 4: I like this diagram but it took me a moment to understand what it was saying. including an eg such as 'land use change is an important driver once a species is introduced' would help make it easier to understand.	Thank you, this figure has been redesigned and is now easy to read and simpler in the second order draft of the SPM
Lieurance, Deah	Summary for policymakers	19	19	467	468	Figure SPM.4: This figure is very hard to interpret. As the reader, I had to go back and forth between the key and the tiny boxes and pie charts,	Thank you, this figure has been redesigned and is now easy to read and simpler in the second order draft of the SPM
Maillard, Jean- François	Summary for policymakers	19	19	467	467	Figure SPM 4: It is not sure whether the colours are suitable for colour blind people. This is a point to be taken into account for the final layout	Thank you, we have revised this figure and changes the colours in the second order draft
Meslier, Violaine	Summary for policymakers	19	19	467	467	Figure SPM 4: It is not sure whether the colours are suitable for colour blind people. This is a point to be taken into account for the final layout	Thank you, we have revised this figure and changes the colours in the second order draft
Poulet, Nicolas	Summary for policymakers	19	19	467	467	Figure SPM 4: It is important to keep this type of figure as it counterbalances the written parts of the SPM.	Thank you for your feedback, it is much appreciated by the authors.

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Poulet, Nicolas	Summary for policymakers	19	19	467	467	Figure SPM 4: It is not sure whether the colours are suitable for colour blind people. This is a point to be taken into account for the final layout	Thank you, we have revised this figure and changes the colours in the second order draft
Taki, Hisatomo	Summary for policymakers	19	19	467	468	Figure SPM.4: In the figure, the characters look blurred or may be too small.	Thank you, this figure has been redesigned and is now easy to read and simpler in the second order draft of the SPM
Curd, Amélia	Summary for policymakers	20	20	400	400	Figure SPM. 3: Three marine LMEs, for which there are many publications and referenced data, appear as "missing information" on this figure: Gulf of California, Celtic Seas and especially the Mediterranean. By using the AquaNIS database (http://www.corpi.ku.lt/databases/index.php/aquanis/) or the database underlying a recent paper, led by one of the co-authors of chapter 2 (Bailey, S.A., Brown, L., Campbell, M.L., Canning-Clode, J., Carlton, J.T., Castro, N., Chainho, P., Chan, F.T., Creed, J.C., Curd, A., Darling, J., Fofonoff, P., Galil, B.S., Hewitt, C.L., Inglis, G.J., Keith, I., Mandrak, N.E., Marchini, A., McKenzie, C.H., Occhipinti-Ambrogi, A., Ojaveer, H., Pires-Teixeira, L.M., Robinson, T.B., Ruiz, G.M., Seward, K., Schwindt, E., Son, M.O., Theriault, T.W., Zhan, A., 2020. Trends in the detection of aquatic non-indigenous species across global marine, estuarine and freshwater ecosystems: A 50-year perspective. Divers Distrib ddi.13167. https://doi.org/10.1111/ddi.13167), this figure could be more realistic. The data sources used to generate this figure are largely terrestrial and freshwater. Admittedly there are fewer marine IAS sources, but to reduce bias it is essential to include the ones that exist. The "crustaceans" plot should read, and include, "Freshwater and marine crustaceans".	Thank you, we have revised the figure in the second order draft of the SMP - please see caption for more information on the data
Soubeyran, Yohann	Summary for policymakers	20	20	400	400	Figure SPM. 3: Three marine LMEs, for which there are many publications and referenced data, appear as "missing information" on this figure: Gulf of California, Celtic Seas and especially the Mediterranean. By using the AquaNIS database (http://www.corpi.ku.lt/databases/index.php/aquanis/) or the database underlying a recent paper, led by one of the co-authors of chapter 2 (Bailey, S.A., Brown, L., Campbell, M.L., Canning-Clode, J., Carlton, J.T., Castro, N., Chainho, P., Chan, F.T., Creed, J.C., Curd, A., Darling, J., Fofonoff, P., Galil, B.S., Hewitt, C.L., Inglis, G.J., Keith, I., Mandrak, N.E., Marchini, A., McKenzie, C.H., Occhipinti-Ambrogi, A., Ojaveer, H., Pires-Teixeira, L.M., Robinson, T.B., Ruiz, G.M., Seward, K., Schwindt, E., Son, M.O., Theriault, T.W., Zhan, A., 2020. Trends in the detection of aquatic non-indigenous species across global marine, estuarine and freshwater ecosystems: A 50-year perspective. Divers Distrib ddi.13167. https://doi.org/10.1111/ddi.13167), this figure could be more realistic. The data sources used to generate this figure are largely terrestrial and freshwater. Admittedly there are fewer marine IAS sources, but to reduce bias it is essential to include the ones that exist. The "crustaceans" plot should read, and include, "Freshwater and marine crustaceans".	Thank you, we have revised the figure in the second order draft of the SMP - please see caption for more information on the data
Diaz, Sandra	Summary for policymakers	20	20	469	473	Fig. SPM/4. Great synthesis of an interesting exercise. Some questions, however: how come that AIS is a driver of AIS? Is it the "invasion meltdown" phenomenon? And biodiversity loss a driver as well as (according to the text) a consequence of AIS? And it seems that indirect drivers are ranked much more importantly than the direct drivers by which they operate. All these questions need to be clarified in the legend or in the underlying chapter, and indicated with some sort of clarifying asterisks here.	Thank you, yes. Please refer to the preamble and chapter 3 for more information.
Jactel, Hervé	Summary for policymakers	20	20	471	473	Figure SPM 4: There are better methods, e.g. bayesian expert opinion elicitation	Thank you, we have followed the Delphi method, as documented.
Government of Canada (Chakravarty, Bipasha)	Summary for policymakers	20	20	475	490	Enforcing regulations for introduced species such as cultivated plants, pets or lab animals to restrict their release into the wild is very important.	Thank you for your comment
Government of Canada (Fraleigh, Brad)	Summary for policymakers	20	20	475	491	In the Key Messages, the point (in Background para.12) seems to have been lost that some IAS may have benefits for people, and may have been introduced intentionally for those benefits.	Thank you. This has been corrected in the second order draft of the SPM
Government of Germany	Summary for policymakers	20	20	475	491	Proposal: It would be highly appreciated if information on the ratio intended vs. unintended alien species introduction could be included in this para.	Thank you, this is unfortunately unknown
Government of Mexico (Koleff, Patricia)	Summary for policymakers	20	20	475	491	Need to include Biosecurity measures, to reduce "intentionally" (because lack of campaigns and outreach programmes), but also instead of regulations, other measures in place to avoid/reduce transportation and spread of IAS.	Thank you, this is further developed in section C of the second order draft of the SPM
Grossart, Hans-Peter	Summary for policymakers	20	20	475	491	You also have species moving between biomes how do you treat these in your analyses? Please add a statement...	Thank you, this has been clarified in the preamble of the second order draft of the SPM
Uludag, Ahmet	Summary for policymakers	20	20	475	490	There have been many literature on ornamental trade. It should be stressed further. In addition hybridization between similar species and intra species from different sources shall be discussed. Especially Online pet and ornamental trade is also noted. I can look for specific papers if you need.	Thank you, ornamental trade is mentioned in sections A and B
Government of USA	Summary for policymakers	20	20	477	477	Suggest replacing the term "cosmopolitan" with a different term. Perhaps widespread.	Thank you, this has been deleted in the from the second order draft of the SPM
Government of France	Summary for policymakers	20	20	478	478	Invasive alien species sometimes have, this is not a general rule, even in terrestrial environments	Thank you, this has been clarified in the second order draft of the SPM
Sigala, Pierre	Summary for policymakers	20	20	478	478	Invasive alien species sometimes have, this is not a general rule, even in terrestrial environments	Thank you, this has been clarified in the second order draft of the SPM
Albert, Arnaud	Summary for policymakers	20	20	480	480	This is the only mention of horticulture in the SPM - perhaps this activity could be mentioned in other paragraphs.	Thank you. As this is a short document, we may not mention it more in the second order draft of the SPM
Albert, Arnaud	Summary for policymakers	20	20	485	485	There are some strategies that run against the regulations on invasive alien species	Thank you, yes and they are acknowledged in the second order draft of the SPM of this assessment
Fagot, Cédric	Summary for policymakers	20	20	485	485	There are some strategies that run against the regulations on invasive alien species	Thank you, yes and they are acknowledged in the second order draft of the SPM of this assessment
Government of France	Summary for policymakers	20	20	485	485	There are some strategies that run against the regulations on invasive alien species	Thank you, yes and they are acknowledged in the second order draft of the SPM of this assessment
Maillard, Jean-François	Summary for policymakers	20	20	485	485	There are some strategies that run against the regulations on invasive alien species	Thank you, yes and they are acknowledged in the second order draft of the SPM of this assessment
Meslier, Violaine	Summary for policymakers	20	20	485	485	There are some strategies that run against the regulations on invasive alien species	Thank you, yes and they are acknowledged in the second order draft of the SPM of this assessment

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Poulet, Nicolas	Summary for policymakers	20	20	485	485	There are some strategies that run against the regulations on invasive alien species	Thank you, yes and they are acknowledged in the second order draft of the SPM of this assessment
Diaz, Sandra	Summary for policymakers	20	20	487	487	replace " biodiversity" with " nature and its contributions to people", to be consistent with the IPBES conceptual framework and the terminology used so far in the SPM.	Thank you, we have done that where appropriate in the second order draft of the SPM
Government of France	Summary for policymakers	20	20	487	487	To be more coherent with IPBES conceptual framework, we suggest to write "biodiversity and its contributions to people" instead of "biodiversity and ecosystem services"	Thank you. We have revised the second order draft of the SPM to be consistent with the conceptual framework
Albert, Arnaud	Summary for policymakers	20	20	488	488	"are being used ": There are few countries that actually use these assessments. This statement needs to be nuanced.	Thank you, this has been rephrased, accordingly in the second order draft of the SPM
Albert, Arnaud	Summary for policymakers	20	20	488	488	It would be relevant to specify who makes and uses these assessments. Would it be the "many countries" mentioned in the previous sentence?	Thank you, this sentence has been deleted and the comment is no longer relevant
Evans, Thomas	Summary for policymakers	20	20	488	488	Import risk assessment frameworks? Delete import?	Thank you, we rephrased it as import risk analysis - following the evidence from the chapter
Fagot, Cédric	Summary for policymakers	20	20	488	488	It would be relevant to specify who makes and uses these assessments. Would it be the "many countries" mentioned in the previous sentence?	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of France	Summary for policymakers	20	20	488	488	"are being used ": There are few countries that actually use these assessments. This statement needs to be nuanced.	Thank you, this has been rephrased, accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	20	20	488	488	It would be relevant to specify who makes and uses these assessments. Would it be the "many countries" mentioned in the previous sentence?	Thank you, this sentence has been deleted and the comment is no longer relevant
Maillard, Jean-François	Summary for policymakers	20	20	488	488	It would be relevant to specify who makes and uses these assessments. Would it be the "many countries" mentioned in the previous sentence?	Thank you, this sentence has been deleted and the comment is no longer relevant
Meslier, Violaine	Summary for policymakers	20	20	488	488	It would be relevant to specify who makes and uses these assessments. Would it be the "many countries" mentioned in the previous sentence?	Thank you, this sentence has been deleted and the comment is no longer relevant
Poulet, Nicolas	Summary for policymakers	20	20	488	488	It would be relevant to specify who makes and uses these assessments. Would it be the "many countries" mentioned in the previous sentence?	Thank you, this sentence has been deleted and the comment is no longer relevant
Evans, Thomas	Summary for policymakers	20	21	493	519	Being honest I think this whole section needs reviewing. Line 513 - 514 is repetitive 'and it is expected that invasive alien species will increase in areas vulnerable to invasive alien species'. I just feel it isn't written concisely and there are paragraphs that don't make sense.	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Canada (Frleigh, Brad)	Summary for policymakers	20	21	493	519	The point of Background para.13 that "Direct and indirect drivers of biodiversity change are increasing, and their interactions exacerbate the impacts of alien species over time" is not found in the Key Messages. So para.13 is background to what?	Thank you, we have ensured consistency with the key messages in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	20	21	493	519	Not all the material in this section relates to trends in drivers and their interactions, as framed by the opening sentence, and it's not clear why details such as Antarctic tourism have been elevated to SPM level. Lines 516-519 are not policy relevant and can be deleted - should the authors disagree, a line-of-sight and confidence levels are missing.	Thank you, this has been revised, accordingly
Government of Germany	Summary for policymakers	20	20	493	493	Proposal: Please check if this message should address "biodiversity loss" instead of "biodiversity change".	Thank you, authors believe biodiversity change is more appropriate
Grossart, Hans-Peter	Summary for policymakers	20	21	493	519	#13: I am curious is there an effect of the COVID pandemics and the lower number of people travelling??	Thank you, we can only assess the available evidence and it may be too early to establish this statement
Setsaas, Trine Hay	Summary for policymakers	20	20	493	493	Should "biodiversity change" be changed to "environmental change"?	Thank you, authors believe biodiversity change is more appropriate
Government of France	Summary for policymakers	20	20	496	496	There are also negative impacts.	Yes, authors agree with the reviewer.
Jactel, Hervé	Summary for policymakers	20	20	496	496	There are also negative impacts.	Yes, authors agree with the reviewer.
Government of France	Summary for policymakers	20	20	497	497	Add "other" before "biological invasion"	Thank you, this sentence has been deleted and is therefore no longer relevant
Jactel, Hervé	Summary for policymakers	20	20	497	497	Add "other" before "biological invasion"	Thank you, we have revised the paragraph accordingly in the second order draft of the SPM
Danner, Marie-Claire	Summary for policymakers	20	20	499	502	Considerate to the cut the sentence in 2 to make it more understandable what is the subject	Thank you, this sentence has been deleted and is therefore no longer relevant
Evans, Thomas	Summary for policymakers	20	20	499	502	This paragraph doesn't make sense. I think a phrase is missing?	Thank you, this sentence has been deleted and is therefore no longer relevant
Government of France	Summary for policymakers	20	20	499	502	Considerate to the cut the sentence in 2 to make it more understandable what is the subject	Thank you, this sentence has been deleted and is therefore no longer relevant
Government of Norway (Vik, Nina)	Summary for policymakers	20	20	499	502	Please write clearer. The most fundamental indirect drivers are consumption and human migration?	Thank you, we have rephrased this statement in the second order draft of the SPM, and the comment is no longer relevant
Government of UK (Sarah Webster, Defra)	Summary for policymakers	20	20	499	502	I have read this sentence half a dozen times, and still cannot make out what it is saying or what the subject of the sentence is (possibly "consumption"?). This is the sort of thing that represents a real barrier to the report's acceptance; "Among the demographic drivers, historically the most fundamental indirect factors behind the increase in alien species, consumption by some densely populated regions contributes to the abundance of alien species, and human migration can result in the transport of alien species (well established) {3.2.2.1, 3.2.2.2}."	Thank you, this sentence has been deleted and is therefore no longer relevant

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of France	Summary for policymakers	20	20	500	500	It is less clear-cut than that. This sentence should be more nuanced.	Thank you, this sentence has been deleted and is therefore no longer relevant
Poulet, Nicolas	Summary for policymakers	20	20	500	500	It is less clear-cut than that. This sentence should be more nuanced.	Thank you, this sentence has been deleted and is therefore no longer relevant
Lang, Iris	Summary for policymakers	20	20	502	505	Remove "acting on one or more anthropogenic direct drivers" or reformulate ? The sentence is quite complex and not clear (previous drivers listed before are anthropogenic drivers, aren't they ?)	Thank you, done
Setsaas, Trine Hay	Summary for policymakers	20	20	503	506	Economic drivers and the role of economic sectors should be more explicitly addressed in the Key Messages. This is highly relevant for decision-makers and policy-makers. See also comment above.	Thank you, it is now clearly stated in the key messages in the second order draft of the SPM
Albert, Arnaud	Summary for policymakers	20	21	509	515	the sentence is too long and too complicated. Need to reformulate or add parentheses. Consider using ";" or 2 sentences after "demographic drivers". Confidence level is missing.	Thank you, the paragraph has been revised to address this issue in the second order draft of the SPM
Calderón, Isabel	Summary for policymakers	20	20	509	509	It could be interesting to mention ongoing negotiations on e-commerce at the WTO.	Thank you. We Introduced the handling of e-commerce in chapter 3
Evans, Thomas	Summary for policymakers	20	20	509	512	As above - line 510 does not flow. Does it need a full stop somewhere?	Thank you, the paragraph has been revised to address this issue in the second order draft of the SPM
Fagot, Cédric	Summary for policymakers	20	21	509	515	the sentence is too long and too complicated. Need to reformulate or add parentheses. Consider using ";" or 2 sentences after "demographic drivers". Confidence level is missing.	Thank you, the paragraph has been revised to address this issue in the second order draft of the SPM
Government of France	Summary for policymakers	20	21	509	515	the sentence is too long and too complicated. Need to reformulate or add parentheses. Consider using ";" or 2 sentences after "demographic drivers". Confidence level is missing.	Thank you, the paragraph has been revised to address this issue in the second order draft of the SPM
Government of UK (Mortimer, Diana)	Summary for policymakers	20	20	509	510	sentence ' economic drivers ... demographic drivers' it feels like two sentences have been put together and I'm no longer clear what it is trying to say.	Thank you, the paragraph has been revised to address this issue in the second order draft of the SPM
Maillard, Jean-François	Summary for policymakers	20	21	509	515	the sentence is too long and too complicated. Need to reformulate or add parentheses. Consider using ";" or 2 sentences after "demographic drivers". Confidence level is missing.	Thank you, the paragraph has been revised to address this issue in the second order draft of the SPM
Meslier, Violaine	Summary for policymakers	20	21	509	515	the sentence is too long and too complicated. Need to reformulate or add parentheses. Consider using ";" or 2 sentences after "demographic drivers". Confidence level is missing.	Thank you, the paragraph has been revised to address this issue in the second order draft of the SPM
Poulet, Nicolas	Summary for policymakers	20	21	509	515	the sentence is too long and too complicated. Need to reformulate or add parentheses. Consider using ";" or 2 sentences after "demographic drivers". Confidence level is missing.	Thank you, the paragraph has been revised to address this issue in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	20	20	512	512	Tourist (singular)	Thank you, this has been deleted and the comment is no longer relevant
Government of Finland (Niemi-Lahhti, Johanna)	Summary for policymakers	20	20	513	513	please add also Arctic region	Thank you, we have deleted this example, and the comment is therefore no longer relevant
Sieffert, Laetitia	Summary for policymakers	21	21	409	409	this is a crucial statement as well meaning but poorly understood initiatives sometimes make the problem worse, it is important that this is clear to decision makers	Thank you for your feedback.
Government of France	Summary for policymakers	21	21	514	514	It is difficult to understand what the term "emerging economic powers" refers to - is it developing countries or sectors? It should be made clear that these are countries.	Thank you, this has been removed accordingly from the second order draft of the SPM
Government of Germany	Summary for policymakers	21	21	514	514	Clarification needed: It is not clear what is meant by "and in emerging economic powers". Proposal: Please consider to define more clearly what is meant or use established terms.	Thank you, this has been removed accordingly from the second order draft of the SPM
Government of UK (Mortimer, Diana)	Summary for policymakers	21	21	514	514	suggest you replace 'powers' with economies.	Thank you, this has been removed accordingly in the second order draft
Soubeyran, Yohann	Summary for policymakers	21	21	514	514	It is difficult to understand what the term "emerging economic powers" refers to - is it developing countries or sectors? It should be made clear that these are countries.	Thank you, this has been removed accordingly from the second order draft of the SPM
Kamal Kumar Rai	Summary for policymakers	21	21	520	520	Need to establish legal certainty around procedures, and a precautionary approach should be established that ensures the customary system of IPLCs in respect to UNDRIP, ILO 169 and provisions of CBD while designing the activities on IPLCs lands, waters, ecosystems, territories that protect further ecological crisis	Thank you, this is now covered in the chapters in more depth and in the SPM
Government of Australia	Summary for policymakers	21	21	521	539	Suggest adding reference to the opportunity to engage people from all walks of life in IAS surveillance including community members, farmers, and private businesses (called general surveillance). These approaches are already making valuable contributions to early detection and understanding AIS spread. However, it needs to be done well to be cost-effective.	Thank you for your suggestion - the text has been changed substantially in the second order draft of the SPM according to the comments.
Government of France	Summary for policymakers	21	21	522	522	We suggest the following rewording : "that weaken evidence-based decision-making"	Thank you, done
Government of Argentina	Summary for policymakers	21	21	529	529	If there is a shifting baseline syndrome, why are there so many references to 1970?	Thank you, this has been deleted in the second order draft of the SPM
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	21	21	531	534	B14 lines 531-534 need to be summarised in the key messages – management actions are delayed until it is too late.	Thank you, this is now reflected in the key messages of the second order draft of the SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	21	21	532	533	The phrase, "sometimes up to several decades or longer" - makes no sense - if it is delayed by "up to" several decades, the corollary is that it is not longer	Thank you, this has been edited accordingly in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	21	21	536	536	for those 'alien species' already established	Thank you, this sentences has been revised and the comment is no longer relevant
Government of Australia	Summary for policymakers	21	21	541	541	consider altering the jargon to easily more comprehensible terms - - alter Multiscale heterogeneity . One assumes the whole document will be examined for clarity for English as second language readers	Thank you, this has been simplified in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Canada (Fraleigh, Brad)	Summary for policymakers	21	21	541	552	The point of "multiscale heterogeneity" seems to have been lost in the Key Messages. So Background para.15 is background to what?	Thank you, this has been corrected in the second order draft of the SPM
Government of Mexico	Summary for policymakers	21	21	547	547	Unless involved in IPBES processes and assessments, policy makers are not familiar with "IPBES units of analysis". Maybe a footnote could be included with the explanation or the link to IPBES (https://ipbes.net/glossary/units-analysis) or the example could be deleted.	Thank you, this has been deleted for better clarity in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	21	21	551	551	mainland what? Perhaps mainland ecosystems	Thank you, this has been deleted for better clarity in the second order draft of the SPM
Brooks, Thomas	Summary for policymakers	21	22	554	560	B16 is particularly important	Thank you for your feedback.
Evans, Thomas	Summary for policymakers	21	21	558	558	especially former European (delete the)	Thank you, this has been corrected in the second order draft of the SPM
Government of France	Summary for policymakers	21	22	558	559	Especially the former deserted island with long histories of repeated species introductions since human colonisation. Even Polynesians have introduced IAS, it is not a fact special to Europeans.	Thank you, but here it is just an example
Sigala, Pierre	Summary for policymakers	21	22	558	559	Especially the former deserted island with long histories of repeated species introductions since human colonisation. Even Polynesians have introduced IAS, it is not a fact special to Europeans.	Thank you, but here it is just an example
Government of UK (Mortimer, Diana)	Summary for policymakers	22	22	559	559	delete 'former European island colonies' replace with 'former colonies and overseas territories with .long histories of trade and repeated species introductions'	Thank you, but here it is just an example
Diaz, Sandra	Summary for policymakers	22	22	562	562	replace "have economic benefits and convenient ecosystem services" with "provide some positive nature's contributions to people, some with economic benefit" to be consistent with the IPBES framework.	Thank you, there were substantial changes to the paragraph, and the reviewer's concern was addressed in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	22	22	562	588	Some paragraphs might be useful to break up this long section of text. Perhaps at 568.	Thank you, done
Government of Australia	Summary for policymakers	22	22	562	588	this paragraph would be improved with an action statement at the ends	Thank you, we have revised the structure in the second order draft of the SPM accordingly
Government of Canada (Chakravarty, Bipasha)	Summary for policymakers	22	22	562	588	It is far easier to enforce legislations for intended introductions like traded species than for unintended introductions. This applies to species that are introduced for lack of awareness or due to incomplete policies and these gaps need to be addressed	Thank you, we have redrafted this paragraph and awareness is also mentioned as a policy option to achieve international targets on IAS in the second order draft of the SPM
Government of France	Summary for policymakers	22	22	563	563	Add "may" before "lead" because this can be the case but not every time	Thank you, we have revised the paragraph accordingly in the second order draft of the SPM
Jactel, Hervé	Summary for policymakers	22	22	563	563	Add "may" before "lead" because this can be the case but not every time	Thank you, we have revised the paragraph accordingly in the second order draft of the SPM
Brooks, Thomas	Summary for policymakers	22	22	566	566	It would be useful to add here "as documented by official UN Sustainable Development Goal indicator 15.8.1". The traceable account is {6.1.3}.	Thank you, this paragraph has been deleted and the comment is no longer relevant.
Government of Germany	Summary for policymakers	22	22	568	570	Clarification needed: The information of this sentence is unclear. Please clarify.	Thank you, we have tried to simplify it in the second order draft of the SPM
Government of Germany	Summary for policymakers	22	22	574	574	Proposal: Is it necessary to address "aid programmes"? It is recommended to delete this point.	Thank you, but this has been identified as a driver (please refer to chapter 3) of the second order draft of the SPM
Government of France	Summary for policymakers	22	22	575	576	Instead of "to have economic benefits and convenient ecosystem services", we suggest to write "to contribute to human well-being" to be more coherent with IPBES conceptual framework	Thank you, there were substantial changes to the paragraph, and the reviewer's concern was addressed in the second order draft of the SPM
Government of USA	Summary for policymakers	22	22	577	588	This section is written as if the only consideration is prevention of the introduction and establishment of invasive populations at the expense of all other considerations. In some cases, such as to mitigate climate change or reduction of an invasive species through biological control, the benefits are carefully weighed against the risks. We suggest the authors acknowledge that multiple factors are considered when making policy decisions, not just whether invasive species are involved, and discuss the importance of risk assessments/cost-benefit analysis when making decisions to intentionally release an alien species.	Thank you. In the second order draft of the SPM, we clarified the focus of this paragraph, which is on the inadequate measures caused by the lack of awareness on IAS
Government of Switzerland	Summary for policymakers	22	22	578	579	We do not understand the reference to "Agroforestry crops" as a major economic sector. Moreover the concept of Agroforestry crops does not exist as such. It will be more adequate to use : agricultural crops (or simply crops), forestry,	Thank you, this has been deleted in the second order draft of the SPM
Government of Netherlands (Kreiken, Bob)	Summary for policymakers	22	22	580	581	Explicit mention of invasive alien species risk in afforestation and climate mitigation programmes would be very valuable, especially in the light of paragraphs on coordinated environmental policy in D.	Thank you, national policies in response to climate change have been mentioned
Government of Switzerland	Summary for policymakers	22	22	580	582	The sentence is confusing and not supported by referred evidence. We have in particular problems with the link between "promotion of invasive alien plant species" and "improvement in pollination services" and to a certain extent also with "augmentation of soil fertility", we recommend to stop the sentence after soil erosion.	Thank you. Kindly refer to chapter 3 for more information on these links
Diaz, Sandra	Summary for policymakers	22	22	582	582	replace " pollination services" with " pollination of useful cultivated and wild plants" or simply " pollination"	Thank you, this has been deleted from the second order draft of the SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	22	22	582	585	Mention of planting of alien species for carbon sequestration and biofuels is welcome	Thank you for your feedback.
Government of Canada (Bouchier, Rob)	Summary for policymakers	22	22	585	588	The statement " In some cases, unregulated release of alien pathogens (e.g., rabbit calicivirus), arthropods and fish for biological control have led to unintended consequences and impacts" The statement should read. In some cases, the unregulated and deliberate release of alien pathogens (e.g., rabbit calicivirus), arthropods and fish have led to unintended consequences and impacts" They were unregulated releases which is critical point. There is implication by association in the statement that biological control with especially arthropods which today is well regulated is a problem, when it is not and instead is one of key management tools.	Thank you, this sentence has been deleted and the comment is no longer relevant.
Government of France	Summary for policymakers	22	22	587	587	Fish for poorly prepared biological control have. it is unacceptable that only biological control appears in this document as a means of control (no mention of chemical control, nor against animal or plant IAS), and always with a negative connotation	Thank you, this has been deleted in the second order draft of the SPM
Sigala, Pierre	Summary for policymakers	22	22	587	587	Fish for poorly prepared biological control have. it is unacceptable that only biological control appears in this document as a means of control (no mention of chemical control, nor against animal or plant IAS), and always with a negative connotation	Thank you, this has been deleted from the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Kamal Kumar Rai	Summary for policymakers	22	22	588	588	Awareness, capacity building activities should prioritise ILK and its diverse systems, and IPLCs, including women and youth engagement, as cultural appropriate.	Thank you, these are covered in separate paragraphs in the second order draft of the SPM
Albert, Arnaud	Summary for policymakers	23	27	589	757	It would be necessary to integrate the notion of population and population scale for greater clarity and understanding of the different types of management outlined in this section C.	Thank you, we have referred to biological invasions, instead of invasive alien species to address this comment in the second order draft of the SPM
Albert, Arnaud	Summary for policymakers	23	27	589	757	It would be useful to have alternative proposals for invasive alien species.	Thank you, we are not sure to understand this comment but the SPM hopefully addresses this concern in the second order draft
Albert, Arnaud	Summary for policymakers	23	27	589	757	This section does not address waste (produced by IAS management interventions) management at all, while it is a growing issue for natural area managers (who need to export IAS waste correctly and without any risk of dissemination) and waste management platforms (who are not aware of the risks posed by IAS, or when they are, can refuse to accept the waste for management). In France, a best practice guide will soon be published about the subject (UICN Comité français and Suez Recyclage et valorisation, in press). A first overview of waste management options for about 60 invasive plant species is available here : http://especes-exotiques-envahissantes.fr/guide-technique_dechets_pee_tableau/	Thank you for this information. We did not explicitly cover waste management, but this is clearly a pathway for spread for invasive alien plants along with moving other vegetative products like hay in times of drought.
Government of France	Summary for policymakers	23	27	589	757	It would be necessary to integrate the notion of population and population scale for greater clarity and understanding of the different types of management outlined in this section C.	Thank you, we have referred to biological invasions, instead of invasive alien species to address this comment in the second order draft of the SPM
Government of France	Summary for policymakers	23	27	589	757	It would be useful to have alternative proposals for invasive alien species. (produced by IAS management interventions) management at all, while it is a growing issue for natural area managers (who need to export IAS waste correctly and without any risk of dissemination) and waste management platforms (who are not aware of the risks posed by IAS, or when they are, can refuse to accept the waste for management). In France, a best practice guide will soon be published about the subject (UICN Comité français and Suez Recyclage et valorisation, in press). A first overview of waste management options for about 60 invasive plant species is available here : http://especes-exotiques-envahissantes.fr/guide-technique_dechets_pee_tableau/	Thank you for this information. We did not explicitly cover waste management, but this is clearly a pathway for spread for invasive alien plants along with moving other vegetative products like hay in times of drought.
Government of France	Summary for policymakers	23	27	589	757	This section does not address the potential positive aspects of alien invasive species, which may in some specific cases and contexts provide a benefit to local biodiversity, either by modifying local conditions or because the area was already deeply deserted or very poor in biodiversity.	Thank you, this is addressed in Section A of the second order draft of the SPM
Government of France	Summary for policymakers	23	27	589	757	This section does not address waste management at all.	Thank you. We did not identify a suitable key message around waste management that merited a mention in the SPM.
Government of Germany	Summary for policymakers	23	27	589	757	General Comment on part C: Why is there no specific key message on protected areas in part C? Potentially this would be advisable to add.	Thank you, protected areas are covered and evidence shows that their protection status do not prevent them from being invaded. This is why authors did not create a specific key message on them
Government of Germany	Summary for policymakers	23	23	589	599	Need for clarification: This seems to be very optimistic- there may be circumstances where this does not hold true and impacts of IAS cannot be fully prevented. Furthermore, it contradicts the statement p. 28, l. 776-778 ("Data available for assessing the management of pathways and species, and in particular on the effectiveness of management interventions, are inadequate and largely unavailable"). Please change the formulation "can be prevented" to, e.g. "can be significantly reduced" OR replace "prevent" by reduced".	Thanks for this suggested change of wording. It is an improvement and we have adopted it in the second order draft of the SPM
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	23	27	589	757	As mentioned above, insufficient consideration of plant health and animal health responses is included here.	Thank you, a broader discussion is included in the chapter of the second order draft of the SPM
Pellens, Roseli	Summary for policymakers	23	27	589	757	This section does not address the potential positive aspects of alien invasive species, which may in some specific cases and contexts provide a benefit to local biodiversity, either by modifying local conditions or because the area was already deeply deserted or very poor in biodiversity.	Thank you, this is addressed in Section A of the second order draft of the SPM
Poulet, Nicolas	Summary for policymakers	23	27	589	757	It would be necessary to integrate the notion of population and population scale for greater clarity and understanding of the different types of management outlined in this section C.	Thank you, we have referred to biological invasions, instead of invasive alien species to address this comment in the second order draft of the SPM
Sarat, Emmanuelle	Summary for policymakers	23	27	589	757	This section does not address waste (produced by IAS management interventions) management at all, while it is a growing issue for natural area managers (who need to export IAS waste correctly and without any risk of dissemination) and waste management platforms (who are not aware of the risks posed by IAS, or when they are, can refuse to accept the waste for management). In France, a best practice guide will soon be published about the subject (UICN Comité français and Suez Recyclage et valorisation, in press). A first overview of waste management options for about 60 invasive plant species is available here : http://especes-exotiques-envahissantes.fr/guide-technique_dechets_pee_tableau/	Thank you for this information. We did not explicitly cover waste management, but this is clearly a pathway for spread for invasive alien plants along with moving other vegetative products like hay in times of drought.
Stiger-Pouvreau, Valérie	Summary for policymakers	23	27	589	757	This section does not address the potential positive aspects of alien invasive species, which may in some specific cases and contexts provide a benefit to local biodiversity, either by modifying local conditions or because the area was already deeply deserted or very poor in biodiversity.	Thank you, this is addressed in Section A of the second order draft of the SPM
Collas, Marc	Summary for policymakers	23	23	591	593	A point of attention on the proposed typology: this global approach, which does not apply to all species or taxonomic groups and all contexts.	Thank you, the background paragraphs provide details on the different contexts and taxa
Evans, Thomas	Summary for policymakers	23	23	591	613	Two paragraphs perhaps? Perhaps at line 600?	Thank you, the paragraph has been shortened in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	23	23	591	593	The line of sight here refers to more than 40 pages of text, for what is a definition. What is not clear is whether the term "management" applies broadly, to include transport before introduction and the mitigation of impacts once species are established and eradication efforts are abandoned - in Fig SPM.5, management includes both of these, yet in some places, the term seems to include only prevention and eradication efforts. Adaptation is also a management response. Suggest that this sentence be simplified into a statement of fact requiring no line of sight or confidence statement: "IAS management can take one of three approaches, focussed on a) pathways, b) species or c) sites/ecosystems." The following sentences could describe each of these in turn (Ch 5 lines 1196-1197 would be appropriate for sites).	Thank you, this has been corrected in the second order draft of the SPM and the term management has been clarified (in the glossary)
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	23	26	591	730	There is some overlap between points 18, 19 and 22. Reorganization of the background points to align with the key messages section would consolidate related material under each point.	Thank you, overlaps have been reduced in the second order draft of the SPM
Government of France	Summary for policymakers	23	23	591	593	A point of attention on the proposed typology: this global approach, which does not apply to all species or taxonomic groups and all contexts.	Thank you, the background paragraphs provide details on the different contexts and taxa

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Germany	Summary for policymakers	23	23	591	592	Proposal: Please consider mentioning the bridgehead effects, which stands for the introduction of an invasive alien species from an established invasive population in another region and not directly from its area of origin - this process is seen as a secondary introduction. The primary or secondary introduction of the invasive alien species may influence the management and its outcomes. Thus, management design and implementation should be adapted considering whether the invasive alien species originates from a primary or a secondary introduction (Lombaert E., Guillemaud, T., Cornuet, J.-M., Malausa, T., Facon, B., Estoup, A. 2010. Bridgehead effect in the worldwide invasion of the biocontrol harlequin ladybird. PLoS One 5:e9743; Ricciardi, A., Blackburn, T. M., Carlton, J. T., Dick, J. T. A., Hulme, P. E., Iacarella, J. C., Jeschke, J. M., Liebhold, A. M., Lockwood, J. L., MacIsaac, H J., Pysek P., Richardson, D. M., Ruiz, G. M., Simberloff, D., Sutherland, W. J., Wardle, D. A., Aldridge, D. C. 2017. Invasion science: A horizon scan of emerging challenges and opportunities. Trends in Ecology and Evolution, 32: 464-474). For example add "primary and secondary" before "pathways of introduction"	Thank you. Authors think adding primary and secondary is not necessary in the title, which is now too long, and that the sentence or the concept "managing pathways" includes all types of management for all types of introductions (primary and secondary).
Lang, Iris	Summary for policymakers	23	23	591	593	The attention of decision-makers should also be drawn to the risks and negative consequences of management (e.g. changing traits). e.g direct negative impacts on the ecosystem, or indirect impacts through harvest-driven trait changes of invasive species). see https://esajournals.onlinelibrary.wiley.com/doi/10.1002/fee.1922 and https://pubmed.ncbi.nlm.nih.gov/33463893/	Thank you, this is now covered in the chapters in more depth and in the SPM
Government of Germany	Summary for policymakers	23	23	592	592	Proposal: Please consider substituting "at a local or landscape level" with "at a multiscale approach".	Thank you, but authors think the original text is more appropriate and clearer.
Government of Germany	Summary for policymakers	23	23	593	595	Proposal: Please consider mentioning the bridgehead effects here, for example add "of primary and secondary introduction" after "Pathway management" (L593-594).	Thank you. Authors think adding primary and secondary is not necessary in the title, which is now too long, and that the sentence or the concept "managing pathways" includes all types of management for all types of introductions (primary and secondary).
Government of USA	Summary for policymakers	23	23	593	595	Adding an example of pathway management could be helpful here.	Thank you, in the second order draft of the SPM, we have revised for clarification
Government of Germany	Summary for policymakers	23	23	596	596	Proposal: Please consider adding "mitigation" after "eradication".	Thank you, but mitigation is the objective of management actions so, it need not be specifically included.
Curd, Amélia	Summary for policymakers	23	23	597	597	Chapter 5 defines site based management as protected areas. This definition should also appear in the SPM.	Thank you, the definition now appears in the glossary of the second order draft of the SPM
Government of France	Summary for policymakers	23	23	597	597	Chapter 5 defines site based management as protected areas. This definition should also appear in the SPM.	Thank you, the definition now appears in the glossary of the second order draft of the SPM
Curd, Amélia	Summary for policymakers	23	23	598	598	"ecosystem restoration" : This corresponds to a new concept that is not present in Figure SPM.5. It would be necessary to harmonise the terms in the text and in the figure to facilitate the understanding of the messages.	Thanks for this comment. The word "ecosystem" was deleted to harmonise text and terms in the second order draft of the SPM
Government of France	Summary for policymakers	23	23	598	598	"ecosystem restoration" : This corresponds to a new concept that is not present in Figure SPM.5. It would be necessary to harmonise the terms in the text and in the figure to facilitate the understanding of the messages.	Thanks for this comment. The word "ecosystem" was deleted to harmonise text and terms in the second order draft of the SPM
Government of France	Summary for policymakers	23	23	598	598	Restoration of ecosystems also allows for good resilience and resistance of ecosystems and can also be a means of preventing invasions. This is not clearly explained in the text.	Thank you, but this is discussed elsewhere. Here the statement is on the different means of management - not its outcomes.
Government of France	Summary for policymakers	23	23	598	598	Restoration should be more clearly defined.	Thank you. Restoration is defined in the IPBES core glossary
Lang, Iris	Summary for policymakers	23	23	598	598	Restoration of ecosystems also allows for good resilience and resistance of ecosystems and can also be a means of preventing invasions. This is not clearly explained in the text.	Thank you, but this is discussed elsewhere. Here the statement is on the different means of management - not its outcomes.
Meslier, Violaine	Summary for policymakers	23	23	598	598	Restoration should be more clearly defined.	Thank you. Restoration is defined in the IPBES core glossary
Pellens, Roseli	Summary for policymakers	23	23	598	598	"ecosystem restoration" : This corresponds to a new concept that is not present in Figure SPM.5. It would be necessary to harmonise the terms in the text and in the figure to facilitate the understanding of the messages.	Thanks for this comment. The word "ecosystem" was deleted to harmonise text and terms in the second order draft of the SPM
Poulet, Nicolas	Summary for policymakers	23	23	598	598	In addition to restoration, the preservation of environments is not sufficiently addressed as a means of management and prevention (resistance and resilience). The fact that there is no degradation of the environment is already a management method that should be highlighted. It should be kept in mind that restoration actions can lead to the destruction of environments and encourage invasions, and this is not really explained in the SPM.	Thank you, it is now mentioned although not covered in details in the second order draft of the SPM
Sarat, Emmanuelle	Summary for policymakers	23	23	598	598	"ecosystem restoration" : This corresponds to a new concept that is not present in Figure SPM.5. It would be necessary to harmonise the terms in the text and in the figure to facilitate the understanding of the messages.	Thanks for this comment. The word "ecosystem" was deleted to harmonise text and terms in the second order draft of the SPM
Tassin, Jacques	Summary for policymakers	23	23	600	600	Please replace 'islands and lakes' by 'small islands and small lakes'	Thank you, we have accepted this change in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	23	23	603	604	I would add "... a broad understanding of IAS risks, impacts, and achievable management outcomes" to reflect the generally irreversible nature of IAS once they have become invasive.	Thank you, we have accepted this change and considered it in the second order draft of the SPM
Government of Canada (Chakravarty, Bipasha)	Summary for policymakers	23	23	604	636	Introducing regular taxonomic monitoring and count of species in the wild to observe changes in their numbers and types must be emphasized for early detection.	Thank you for your comment. This issue is addressed in background 23 associated with long term monitoring and in chapter 5.
Collas, Marc	Summary for policymakers	23	23	605	605	Strategies are often poorly known when they exist. There is a real need to raise awareness. The implementation of a parallel regulation is more than necessary and the national strategies represent an indispensable framework for mobilising resources and carrying out actions. Provided that these strategies are known to the public and various stakeholders, they can be effective in limiting imports and exports. This should be emphasised in the text.	Thank you, this is dealt with in section D of the second order draft of the SPM
Curd, Amélia	Summary for policymakers	23	23	605	605	Strategies are often poorly known when they exist. There is a real need to raise awareness. The implementation of a parallel regulation is more than necessary and the national strategies represent an indispensable framework for mobilising resources and carrying out actions. Provided that these strategies are known to the public and various stakeholders, they can be effective in limiting imports and exports. This should be emphasised in the text.	Thank you, this is dealt with in section D of the second order draft of the SPM
Government of France	Summary for policymakers	23	23	605	605	Frameworks such as national strategies are necessary to obtain resources and conversely, to implement the objectives of these frameworks, resources and especially financial resources are needed.	Thank you, we have mentioned this in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of France	Summary for policymakers	23	23	605	605	Strategies are often poorly known when they exist. There is a real need to raise awareness. The implementation of a parallel regulation is more than necessary and the national strategies represent an indispensable framework for mobilising resources and carrying out actions. Provided that these strategies are known to the public and various stakeholders, they can be effective in limiting imports and exports. This should be emphasised in the text.	Thank you, this is dealt with in section D of the second order draft of the SPM
Lang, Iris	Summary for policymakers	23	23	605	605	Frameworks such as national strategies are necessary to obtain resources and conversely, to implement the objectives of these frameworks, resources and especially financial resources are needed.	Thank you, we have mentioned this in the second order draft f the SPM
Lang, Iris	Summary for policymakers	23	23	605	605	Strategies are often poorly known when they exist. There is a real need to raise awareness. The implementation of a parallel regulation is more than necessary and the national strategies represent an indispensable framework for mobilising resources and carrying out actions. Provided that these strategies are known to the public and various stakeholders, they can be effective in limiting imports and exports. This should be emphasised in the text.	Thank you, this is dealt with in section D of the second order draft of the SPM
Evans, Thomas	Summary for policymakers	23	23	607	607	Their application can apply? What is their? Perhaps: These three management actions can be applied at multiple scales?	Thank you , we have revised this sentence in the second order draft of the SPM
Lang, Iris	Summary for policymakers	23	23	607	607	Suggestion : Their application can be extended at multiple scales	Thank you , we have revised this sentence in the second order draft of the SPM
Nunes, Ana	Summary for policymakers	23	23	607	607	Suggest rephrasing 'their application can apply...'	Thank you , we have revised this sentence in the second order draft of the SPM
Collas, Marc	Summary for policymakers	23	23	608	609	Introduction pathways have been underestimated in the marine environment, which will lead to major changes in ecosystems exacerbated by climate change.	Thank you for your comment.
Collas, Marc	Summary for policymakers	23	23	608	609	There is a lack of information about the role of global change and climate change in disrupting ecosystems beyond the issue of biological invasions.	Thank you, information is largely lacking, as reported in the table on knowledge gaps. This is also covered in Section B
Government of Canada (Alexander, Steven)	Summary for policymakers	23	23	608	609	It looks like a confidence statement was not included with regards to successful pathway management for marine invasive alien species.	Thank you, we have added a confidence statement to the second order draft of the SPM.
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	23	23	608	609	as noted at line 119: This is rather sweeping and suggests abandoning any attempt to manage impacts after establishment. There can be value in slowing the spread of marine species or in reducing their impacts - 5.5.5 provides the Styela example. Line of sight and confidence levels are missing.	Thank you, we have revised this sentence accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	23	23	608	609	Introduction pathways have been underestimated in the marine environment, which will lead to major changes in ecosystems exacerbated by climate change.	Thank you for your comment.
Government of France	Summary for policymakers	23	23	608	609	The sentence : "while these approaches are all applicable in terrestrial and inland waters, only pathway management appears to have been successful for marine invasive alien species." has no reference and no level of uncertainty.	Thank you, we have added a confidence statement and traceability to the second order draft of the SPM
Government of France	Summary for policymakers	23	23	608	609	There is a lack of information about the role of global change and climate change in disrupting ecosystems beyond the issue of biological invasions.	Thank you, information is largely lacking, as reported in the table on knowledge gaps. This is also covered in Section B
Government of USA	Summary for policymakers	23	23	608	609	Does the statement "only pathway management appears to have been successful for marin invasive alien species" have any support in the literature? This seems to indicate that all other pathway mitigation efforts have not been successful, which is not accurate.	Thank you, this statement is supported by literature indeed. The statement has been reworded for clarification in the second order draft of the SPM.
Lang, Iris	Summary for policymakers	23	23	608	609	The sentence : "while these approaches are all applicable in terrestrial and inland waters, only pathway management appears to have been successful for marine invasive alien species." has no reference and no level of uncertainty.	Thank you, we have added a confidence statement and traceability to the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	23	23	609	613	The section noted in the line of sight does not seem to support this conclusion	Thank you, we have added confidence terms to the second order draft of the SPM.
Government of Germany	Summary for policymakers	23	23	612	612	Proposal: Please consider adding "climate change" after "biodiversity loss".	Thank you, climate change was added, but this has now been moved to section B of the second order draft of the SPM
Collas, Marc	Summary for policymakers	23	24	615	636	Suggestion to add a paragraph on funding needs: without this, no management action is possible. Testing and appropriating methods represents a human and financial investment. It improves access to the information needed to use and apply these methods in the targeted contexts.	Thank you, the paragraph now mentions this in the second order draft of the SPM
Government of France	Summary for policymakers	23	24	615	636	Suggestion to add a paragraph on funding needs: without this, no management action is possible. Testing and appropriating methods represents a human and financial investment. It improves access to the information needed to use and apply these methods in the targeted contexts.	Thank you, the paragraph now mentions this in the second order draft of the SPM
Government of France	Summary for policymakers	23	23	615	636	This paragraph presents several different ideas: on detection tools, management tools, gaps in knowledge, management coordination, data accessibility.... That's a lot of different concepts in the same key message. It would be better to split it into several key messages or to reinsert each part into other more appropriate key messages: one on early detection, one on management, one on knowledge gaps.	Thank you, we have revised the paragraph in the second order draft of the SPM with your comment in mind.
Hudin, Stéphanie	Summary for policymakers	23	24	615	636	Practitioners experiment with several methods when faced with a species to find out which is the best. There is no typology that allows a species to be associated with a type of management, it is necessary to proceed by prioritisation and elimination on a case-by-case basis. There is a strong need for available information on the application of management methods in the target contexts. This aspect could be further explained in the SPM.	Thank you, the SPM has been revised but more information on this topic is available in the chapters.
Hudin, Stéphanie	Summary for policymakers	23	23	616	618	There is a strong need for available information on the application of management methods in the target contexts. There are methods but it is not always easy to implement them because there is not enough data. Limitations due to lack of data and knowledge on the species, their ecology and their invasibility in different contexts.	Thank you, knowledge gaps are indeed mentioned in a different paragraph in the second order draft of the SPM
Government of Germany	Summary for policymakers	23	23	617	617	Proposal: Please consider adding "multiscale" before "species impact assessment" and "cost risk analysis" too.	Thank you, we have decided to shorten this paragraph, and this comment no longer applies.
Evans, Thomas	Summary for policymakers	23	23	620	620	Hazard? Maybe problem?	Thank you, we have revised this sentence accordingly in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	23	23	621	625	This highlights why it is necessary to specify the purpose of improving our knowledge base each time it is called for in the assessment - this sentence is in direct contrast to lines 634-636. 6.2.2.2 does not exist, 6.2.2 does not provide support for this conclusion. The number of existing agreements does not support the idea that uncertainty does not prevent management action - the number of agreements provides an indicator of the state of governance, but not of on-the-ground management action.	Thank you, this has been clarified in the knowledge gaps paragraph. We have also removed reference to the number of existing agreements in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of USA	Summary for policymakers	23	23	621	630	These sentences are confusing. What is the point being made? The sentences seem to contradict themselves...is the problem lack of knowledge causing uncertainty and difficult decisions or does lack of knowledge provide opportunities for innovation? This is confusing and does not seem to follow with heading of this section.	Thank you, we have revised the paragraph to clarify its focus in the second order draft of the SPM
Lang, Iris	Summary for policymakers	23	23	621	622	Uncertainties associated with the management of invasive alien species (e.g., knowledge of the system, invasion status, potential impacts of the management)	Thank you, we have decided to shorten this paragraph, and this comment no longer applies.
Evans, Thomas	Summary for policymakers	23	23	622	622	Is this the correct type of bracket for e.g., knowledge?	Thank you, this has been deleted in the second order draft of the SPM
Government of Germany	Summary for policymakers	23	23	622	622	Proposal: Please consider adding "and the environmental conditions, including climate change" after "knowledge of the system".	Thank you, this has been deleted in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	23	23	625	626	Adaptive management is what we do when we have insufficient information ahead of time - it is not a goal. Suggest replacement of this sentence with a statement of the need for adaptive management to reach goals given existing uncertainties.	Thank you, this has been deleted from the second order draft of the SPM
Government of Estonia (Otsus, Merit)	Summary for policymakers	23	23	625	626	"These uncertainties can even pave the way for more effective adaptive management" - could you, please, elaborate briefly, as the connection is not so obvious	Thank you, this has been deleted in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	23	23	628	628	always been	Thank you, English has been improved in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	23	23	628	630	It's not clear what is meant by "support" here. Section 6.3.2.1 shows that while progress has been made, it has been insufficient to prevent the growth in IAS spread and impact. "Support" is a vague term and understanding would be improved if the gap were crisply explained.	Thank you, we have corrected this in the second order draft of the SPM
Kamal Kumar Rai	Summary for policymakers	23	23	633	633	Need to include: Full and effective participation of IPLCs, including women, youth, healers, elders	Thank you, participation of IPLCs and other stakeholders is taken up in a different paragraph of the second order draft of the SPM
Government of USA	Summary for policymakers	24	24	537	538	precautionary how? is this different than early detection and response?	Thank you, precautionary approach is now defined in the glossary of the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	24	24	634	636	Section 6.6.2 focuses on opportunities to build the knowledge base, not the need for more knowledge.	Thank you, this has been harmonized in the second order draft of the SPM
Albert, Arnaud	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Although the chapters define site management, it would be useful to have a clear definition of the difference between site management and ecosystem management because the difference is not obvious, especially for a text aimed at decision-makers. If ecosystem management is concerned with the functional dimension, it should be specified.	Thank you. Site and ecosystem management are defined in the glossary section.
Albert, Arnaud	Summary for policymakers	24	24	637	637	Figure SPM.5 : The text and the figure are not coherent: in the text prevention corresponds to the prevention of introductions, while in the figure prevention corresponds to the prevention of entries, which is different.	Thank you, we have aligned the text and figure in the second order draft of the SPM
Collas, Marc	Summary for policymakers	24	24	637	637	Figure SPM.5 : There may be overlapping phases between the different stages shown in this figure. It would be useful and relevant to specify this in the legend.	Thank you for the comment. It is not the purpose of this diagram to show when the invasion stages shift and when they overlap; rather, this diagram aims to conceptually present how management options change as invasion progresses. In light of the purpose of the figure, we decided not to include the explanation about overlaps in invasion stages. There can be overlap of relevant management options between invasion stages, which is clearly indicated in the figure.
Collas, Marc	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Although the chapters define site management, it would be useful to have a clear definition of the difference between site management and ecosystem management because the difference is not obvious, especially for a text aimed at decision-makers. If ecosystem management is concerned with the functional dimension, it should be specified.	Thank you. Site and ecosystem management are defined in the glossary section.
Collas, Marc	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Restoration actions take place before the stage of widespread of alien invasive species populations. Therefore, the restoration action rectangle should cover the absent, establishment and spread phases.	Thank you. Restoration here refers to the process of assisting the recovery of a degraded, damaged, or destroyed ecosystem, as a consequence of biological invasions (see Glossary), and therefore the option is more optimal at later stages of invasion.
Collas, Marc	Summary for policymakers	24	24	637	637	Figure SPM.5 : "Preparedness" : In order to anticipate and react quickly, it is necessary to have frameworks and means available.	Yes, we agree. Thank you.
Curd, Amélia	Summary for policymakers	24	24	637	637	Figure SPM 5 : Examples of control and management are still very limited in the marine environment and experts agree that prevention is the most effective.	Thank you, we have revised the figure accordingly in the second order draft of the SPM
Curd, Amélia	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Although the chapters define site management, it would be useful to have a clear definition of the difference between site management and ecosystem management because the difference is not obvious, especially for a text aimed at decision-makers. If ecosystem management is concerned with the functional dimension, it should be specified.	Thank you. Site and ecosystem management are defined in the glossary section.
Curd, Amélia	Summary for policymakers	24	24	637	637	Figure SPM.5 : The colour gradient for the different types of management is not very visible and the meaning is difficult to understand at first reading.	Thank you, this has been revised accordingly in the second order draft of the SPM
Curd, Amélia	Summary for policymakers	24	24	637	637	Figure SPM.5 : There are many concepts in this figure that need to be clearly defined or simplified.	Thank you, we have tried to simplify it and main terms are defined in the glossary
Dommanget, Fanny	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Although the chapters define site management, it would be useful to have a clear definition of the difference between site management and ecosystem management because the difference is not obvious, especially for a text aimed at decision-makers. If ecosystem management is concerned with the functional dimension, it should be specified.	Thank you. Site and ecosystem management are defined in the glossary section.
Dommanget, Fanny	Summary for policymakers	24	24	637	637	Figure SPM.5 : There are many concepts in this figure that need to be clearly defined or simplified.	Thank you, we have tried to simplify it and main terms are defined in the glossary
Fagot, Cédric	Summary for policymakers	24	24	637	637	Figure SPM. 5 - A : the "adaptive management" rectangle in graph A hides the curve. for better readability, the rectangle should be raised or its transparency increased.	Thank you, we have revised this figure accordingly in the second order draft of the SPM
Fagot, Cédric	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Although the chapters define site management, it would be useful to have a clear definition of the difference between site management and ecosystem management because the difference is not obvious, especially for a text aimed at decision-makers. If ecosystem management is concerned with the functional dimension, it should be specified.	Thank you. Site and ecosystem management are defined in the glossary section.

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Canada (Alexander, Steven)	Summary for policymakers	24	24	637	638	Figure SPM.5 - It was not all together clear how the colored bars/ rows under 'TARGET' in both figure A and B align with the figure. The figure caption did not help in clarifying this point.	Thank you, we have revised the figure to address this point in the second order draft of the SPM
Government of Canada (Chakravarty, Bipasha)	Summary for policymakers	24	24	637	637	The figure SPM.5 indicates management objectives for different systems, but there is a knowledge gap when it comes to adaptive management for B: marine & water-connected systems. Future strategies for control can include gene editing tools & techniques. These options have to be explored for the future as mentioned in Lines 704-709.	Thank you for your suggestion. Future strategies for control including gene editing tools & techniques are explored in chapter 5, section 5.4 and 5.6. It is known that adaptive management for marine and connected water systems is ineffectiveness, and this figure reflects that point.
Government of Chile (Ministry of the Environment)	Summary for policymakers	24	24	637	637	Figure SPM. 5: At the first glance it is hard to understand that the image is a whole one. We recommend extending the stage colors of invasion down to the end of the grey boxes.	Thank you, we have revised this figure and it is hopefully now easier to understand in the second order draft of the SPM
Government of Chile (Ministry of the Environment)	Summary for policymakers	24	24	637	637	Figure SPM. 5: We suggest for a better understanding of the figure to explain all the components. Boxes in grey are not explained (actions).	Thank you for the comment. What the action boxes mean is now explained in the figure legend of the second order draft of the SPM
Government of France	Summary for policymakers	24	24	637	637	Figure SPM.5 : There may be overlapping phases between the different stages shown in this figure. It would be useful and relevant to specify this in the legend.	Thank you for the comment. It is not the purpose of this diagram to show when the invasion stages shift and when they overlap; rather, this diagram aims to conceptually present how management options change as invasion progresses. In light of the purpose of the figure, we decided not to include the explanation about overlaps in invasion stages. There can be overlap of relevant management options between invasion stages, which is clearly indicated in the figure.
Government of France	Summary for policymakers	24	24	637	637	Figure SPM. 5 - A : the "adaptive management" rectangle in graph A hides the curve. for better readability, the rectangle should be raised or its transparency increased.	Thank you, we have revised this figure accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Although the chapters define site management, it would be useful to have a clear definition of the difference between site management and ecosystem management because the difference is not obvious, especially for a text aimed at decision-makers. If ecosystem management is concerned with the functional dimension, it should be specified.	Thank you. Site and ecosystem management are defined in the glossary section.
Government of France	Summary for policymakers	24	24	637	637	Figure SPM. 5 : The categorisation of systems with A: terrestrial and closed water systems and B: marine and water connected systems is confusing as there are disparities and variations between the management objectives of marine and freshwater systems. Perhaps it would be better and clearer for the decision-maker to have a 3rd graph to separate these different types of ecosystems. The pictogram with the wave is confusing.	Thank you. We present two panels, not three, because management approaches and responses can vary depending on whether the affected ecosystem is terrestrial or enclosed by land (e.g., terrestrial ecosystems, catchment basins, coastal systems and salt marshes) or an open water system (e.g., marine, and brackish and water connected systems), rather than depending on whether it is terrestrial, freshwater or marine. The coverage of each panel is now clarified in the legend. We believe the current version is clearer than before. Design of the whole figure has been improved.
Government of France	Summary for policymakers	24	24	637	637	Figure SPM.5 : The colour gradient for the different types of management is not very visible and the meaning is difficult to understand at first reading.	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	24	24	637	637	Figure SPM.5 : There are many concepts in this figure that need to be clearly defined or simplified.	Thank you, we have tried to simplify it and main terms are defined in the glossary
Government of France	Summary for policymakers	24	24	637	638	is it true that the focus on managing pathways doesn't or only slightly changes in A) whereas it changes significantly in B)? We should seek more contrast in the colour shades.	Thank you. In marine and connected water systems, post-establishment management is largely ineffective, and therefore, the relative importance of pathway management as well as that of species and site-based management decrease as invasion proceeds. In contrast, pathway management remains important in terrestrial and other enclosed systems to achieve eradication, containment and long-term control. Colour gradient (contrast) in the figure has been improved in the latest version.
Government of Germany	Summary for policymakers	24	24	637	638	Clarification needed on Figure SPM.5: (1) It is not clear from either figure (A) and (B) whether the absence of IAS on the left side of both figures is due to human preventive measures or whether quasi-intact biomes still exist devoid of IAS due to a lack of human intervention. This remains to be clarified. (2) For marine ecosystems management post establishment is largely ineffective. Consequently, no actions apart from surveillance and monitoring are recommended by the authors. We suppose that this may actually depend on the species under consideration and may vary depending on the context. Isn't there really any further option for action available? If so, is this a research gap? Then please add to table SPM 1. (3) Please provide references for the interrelations presented in this table. Otherwise it might look as somewhat speculative.	Thank you for this comment. (1). This is a conceptual figure that does not represent actual population dynamics of invasive alien species or reasons why invasive species are absent, established or spread. The important message of this figure is that, whichever the reason, prevention is an option when invasive species are absent. (2) Yes, although there are few examples for specific contexts and species, management actions post-establishment of marine invasive alien species is largely ineffective. Please see also chapter 5 section 5.5 for evidence and examples. This gap is considered in table SPMA1. (3) As explained in the figure legend, examples supporting the content of diagram are given in Chapter 5.
Government of Germany	Summary for policymakers	24	24	637	638	Proposal: A new table on options in section "D" of the key messages would clearly benefit from the actions proposed in Figure SPM.5.	Thank you, we have added a table in response to this comment
Government of Mexico (Koleff, Patricia)	Summary for policymakers	24	24	637	638	Figure SPM 5: There is a lack of action in the marine part (B), and although it is difficult, there are lessons learned, such as technological innovation to use IAS, financial instruments and even environmental restoration in certain ecosystems (e.g. coral reefs) should also be promoted.	Thank you. Although there are technological innovation and financial instruments to implement management strategies in marine and water connected ecosystems, the efforts are largely ineffective in the long term once invasive alien species are well established. Restoration in marine ecosystems is currently undertaken with native species (such as coral or oyster reefs) but these cases do not include an eradication of an marine invasive alien species
Hipeau, Elisabeth	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Although the chapters define site management, it would be useful to have a clear definition of the difference between site management and ecosystem management because the difference is not obvious, especially for a text aimed at decision-makers. If ecosystem management is concerned with the functional dimension, it should be specified.	Thank you. Site and ecosystem management are defined in the glossary section.
Hipeau, Elisabeth	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Restoration actions take place before the stage of widespread of alien invasive species populations. Therefore, the restoration action rectangle should cover the absent, establishment and spread phases.	Thank you. Restoration here refers to the process of assisting the recovery of a degraded, damaged, or destroyed ecosystem, as a consequence of biological invasions (see Glossary), and therefore the option is more optimal at later stages of invasion.

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Hipeau, Elisabeth	Summary for policymakers	24	24	637	637	Figure SPM.5 : "Preparedness" : In order to anticipate and react quickly, it is necessary to have frameworks and means available.	Yes, we agree. Thank you.
Hudin, Stéphanie	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Although the chapters define site management, it would be useful to have a clear definition of the difference between site management and ecosystem management because the difference is not obvious, especially for a text aimed at decision-makers. If ecosystem management is concerned with the functional dimension, it should be specified.	Thank you. Site and ecosystem management are defined in the glossary section.
Hudin, Stéphanie	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Restoration actions take place before the stage of widespread of alien invasive species populations. Therefore, the restoration action rectangle should cover the absent, establishment and spread phases.	Thank you. Restoration here refers to the process of assisting the recovery of a degraded, damaged, or destroyed ecosystem, as a consequence of biological invasions (see Glossary), and therefore the option is more optimal at later stages of invasion.
Hudin, Stéphanie	Summary for policymakers	24	24	637	637	Figure SPM.5 : "Preparedness" : In order to anticipate and react quickly, it is necessary to have frameworks and means available.	Yes, we agree. Thank you.
Lang, Iris	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Although the chapters define site management, it would be useful to have a clear definition of the difference between site management and ecosystem management because the difference is not obvious, especially for a text aimed at decision-makers. If ecosystem management is concerned with the functional dimension, it should be specified.	Thank you. Site and ecosystem management are defined in the glossary section.
Lang, Iris	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Restoration actions take place before the stage of widespread of alien invasive species populations. Therefore, the restoration action rectangle should cover the absent, establishment and spread phases.	Thank you. Restoration here refers to the process of assisting the recovery of a degraded, damaged, or destroyed ecosystem, as a consequence of biological invasions (see Glossary), and therefore the option is more optimal at later stages of invasion.
Lang, Iris	Summary for policymakers	24	24	637	637	Figure SPM.5 : "Preparedness" : In order to anticipate and react quickly, it is necessary to have frameworks and means available.	Yes, we agree. Thank you.
Maillard, Jean-François	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Although the chapters define site management, it would be useful to have a clear definition of the difference between site management and ecosystem management because the difference is not obvious, especially for a text aimed at decision-makers. If ecosystem management is concerned with the functional dimension, it should be specified.	Thank you. Site and ecosystem management are defined in the glossary section.
Massé, Cécile	Summary for policymakers	24	24	637	637	Figure SPM 5 : Examples of control and management are still very limited in the marine environment and experts agree that prevention is the most effective.	Thank you, we have revised the figure accordingly in the second order draft of the SPM
Massé, Cécile	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Although the chapters define site management, it would be useful to have a clear definition of the difference between site management and ecosystem management because the difference is not obvious, especially for a text aimed at decision-makers. If ecosystem management is concerned with the functional dimension, it should be specified.	Thank you. Site and ecosystem management are defined in the glossary section.
Massé, Cécile	Summary for policymakers	24	24	637	637	Figure SPM.5 - B : Delete terms "for low mobility" because eradication works in the early stages and not only for low mobility. For example, in the larval stages, organisms will be more mobile (case of most invasive alien species).	Thank you for your suggestion, this term was modified
Massé, Cécile	Summary for policymakers	24	24	637	637	Figure SPM.5 : The colour gradient for the different types of management is not very visible and the meaning is difficult to understand at first reading.	Thank you, this has been revised accordingly in the second order draft of the SPM
Massé, Cécile	Summary for policymakers	24	24	637	637	Figure SPM.5 : For the terrestrial environment, dispersal is facilitated more by humans than in the marine environment. To be clarified on the diagram.	Thank you, this figure is conceptual and only focuses on management, not on drivers
Massé, Cécile	Summary for policymakers	24	24	637	637	Figure SPM.5 : It would be useful to underline the early detection and action in this figure, especially for marine environment.	Thank you. Although we did not employ underlines, we believe that the early detection is well highlighted in the figure. The design of the figure (including text size and font) was improved from an overall perspective.
Massé, Cécile	Summary for policymakers	24	24	637	637	Figure SPM.5 : There are many concepts in this figure that need to be clearly defined or simplified.	Thank you, we have tried to simplify it and main terms are defined in the glossary
Meslier, Violaine	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Although the chapters define site management, it would be useful to have a clear definition of the difference between site management and ecosystem management because the difference is not obvious, especially for a text aimed at decision-makers. If ecosystem management is concerned with the functional dimension, it should be specified.	Thank you. Site and ecosystem management are defined in the glossary section.
Meslier, Violaine	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Restoration actions take place before the stage of widespread of alien invasive species populations. Therefore, the restoration action rectangle should cover the absent, establishment and spread phases.	Thank you. Restoration here refers to the process of assisting the recovery of a degraded, damaged, or destroyed ecosystem, as a consequence of biological invasions (see Glossary), and therefore the option is more optimal at later stages of invasion.
Pellens, Roseli	Summary for policymakers	24	24	637	638	Figure SPM 5: is it true that the focus on managing pathways doesn't or only slightly changes in A) whereas it changes significantly in B)? We should seek more contrast in the colour shades.	Thank you. In marine and connected water systems (Panel B), post-establishment management is largely ineffective, and therefore, the relative importance of pathway management as well as that of species and site-based management decrease as invasion proceeds. In contrast, pathway management remains important in terrestrial and other enclosed systems (Panel A) to achieve eradication, containment and long-term control. Colour gradient (contrast) showing the point described above has been improved in the latest version.
Pellens, Roseli	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Although not in the majority of situations, it seems possible to do ecosystem management in both marine and freshwater environments. There are management and restoration methods for the marine ecosystems. It is true that we cannot eradicate, but we can at least control the abundance of the species.	Thank you. Yes, although there are few examples for specific contexts and species, management actions post-establishment of marine invasive alien species, such as control, containment and eradication are largely ineffective, considering the costs and benefits in the long term. Please see chapter 5 for evidence that support the figure
Pellens, Roseli	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Although the chapters define site management, it would be useful to have a clear definition of the difference between site management and ecosystem management because the difference is not obvious, especially for a text aimed at decision-makers. If ecosystem management is concerned with the functional dimension, it should be specified.	Thank you. Site and ecosystem management are defined in the glossary section.
Pellens, Roseli	Summary for policymakers	24	24	637	637	Figure SPM.5 : The colour gradient for the different types of management is not very visible and the meaning is difficult to understand at first reading.	Thank you, this has been revised accordingly in the second order draft of the SPM
Pellens, Roseli	Summary for policymakers	24	24	637	637	Figure SPM.5 : There are many concepts in this figure that need to be clearly defined or simplified.	Thank you, we have tried to simplify it and main terms are defined in the glossary
Poulet, Nicolas	Summary for policymakers	24	24	637	637	Figure SPM. 5 : The differentiation of the actions to be implemented between the two graphs A and B does not seem justified, as it is also possible to implement chemical treatment or restoration actions in the marine and freshwater environments for example.	Thank you. Restoration in marine ecosystems is currently undertaken with native species (such as coral or oyster reefs) but these cases do not include an eradication of an marine invasive alien species. As explained in chapter 5, once invasive alien species are well established in marine ecosystems, management actions are largely ineffective and highly costly. There are only two examples worldwide for specific species and contexts in where chemical treatment was applied in a marine ecosystem. Please see chapter 5 for further evidence that support the figure differentiation.

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Poulet, Nicolas	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Although not in the majority of situations, it seems possible to do ecosystem management in both marine and freshwater environments. There are management and restoration methods for the marine ecosystems. It is true that we cannot eradicate, but we can at least control the abundance of the species.	Thank you. Yes, although there are few examples for specific contexts and species, management actions post-establishment of marine invasive alien species, such as control, containment and eradication are largely ineffective, considering the costs and benefits in the long term. Please see chapter 5 for evidence that support the figure
Poulet, Nicolas	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Although the chapters define site management, it would be useful to have a clear definition of the difference between site management and ecosystem management because the difference is not obvious, especially for a text aimed at decision-makers. If ecosystem management is concerned with the functional dimension, it should be specified.	Thank you. Site and ecosystem management are defined in the glossary section.
Poulet, Nicolas	Summary for policymakers	24	24	637	637	Figure SPM. 5 : The categorisation of systems with A: terrestrial and closed water systems and B: marine and water connected systems is confusing as there are disparities and variations between the management objectives of marine and freshwater systems. Perhaps it would be better and clearer for the decision-maker to have a 3rd graph to separate these different types of ecosystems. The pictogram with the wave is confusing.	Thank you. We present two panels, not three, because management approaches and responses can vary depending on whether the affected ecosystem is terrestrial or enclosed by land (e.g., terrestrial ecosystems, catchment basins, coastal systems and salt marshes) or an open water system (e.g., marine, and brackish and water connected systems), rather than depending on whether it is terrestrial, freshwater or marine. The coverage of each panel is now clarified in the legend. We believe the current version is clearer than before. Design of the whole figure has been improved.
Sarat, Emmanuelle	Summary for policymakers	24	24	637	637	Figure SPM 5 : Examples of control and management are still very limited in the marine environment and experts agree that prevention is the most effective.	Thank you, we have revised the figure accordingly in the second order draft of the SPM
Stiger-Pouvreau, Valérie	Summary for policymakers	24	24	637	637	Figure SPM. 5 : The differentiation of the actions to be implemented between the two graphs A and B does not seem justified, as it is also possible to implement chemical treatment or restoration actions in the marine and freshwater environments for example.	Thank you. Restoration in marine ecosystems is currently undertaken with native species (such as coral or oyster reefs) but these cases do not include an eradication of an marine invasive alien species. As explained in chapter 5, once invasive alien species are well established in marine ecosystems, management actions are largely ineffective and highly costly. There are only two examples worldwide for specific species and contexts in where chemical treatment was applied in a marine ecosystem. Please see chapter 5 for further evidence that support the figure differentiation.
Stiger-Pouvreau, Valérie	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Although not in the majority of situations, it seems possible to do ecosystem management in both marine and freshwater environments. There are management and restoration methods for the marine ecosystems. It is true that we cannot eradicate, but we can at least control the abundance of the species.	Thank you. Yes, although there are few examples for specific contexts and species, management actions post-establishment of marine invasive alien species, such as control, containment and eradication are largely ineffective, considering the costs and benefits in the long term. Please see chapter 5 for evidence that support the figure
Stiger-Pouvreau, Valérie	Summary for policymakers	24	24	637	637	Figure SPM. 5 : Although the chapters define site management, it would be useful to have a clear definition of the difference between site management and ecosystem management because the difference is not obvious, especially for a text aimed at decision-makers. If ecosystem management is concerned with the functional dimension, it should be specified.	Thank you. Site and ecosystem management are defined in the glossary section.
Stiger-Pouvreau, Valérie	Summary for policymakers	24	24	637	637	Figure SPM.5 - B : Delete terms "for low mobility" because eradication works in the early stages and not only for low mobility. For example, in the larval stages, organisms will be more mobile (case of most invasive alien species).	Thank you for your suggestion, this term was modified
Stiger-Pouvreau, Valérie	Summary for policymakers	24	24	637	637	Figure SPM.5 : There are many concepts in this figure that need to be clearly defined or simplified.	Thank you, we have tried to simplify it and main terms are defined in the glossary
Albert, Arnaud	Summary for policymakers	24	24	639	646	Figure SPM. 5 : It would be necessary to integrate the notion of population and population scale for greater clarity and understanding of the different types of management outlined in this figure.	Thank you, in the second order draft of the SPM, we have replaced most mentions of invasive alien species by biological invasions, which hopefully addresses this comment
Evans, Thomas	Summary for policymakers	24	24	639	639	Fig. SPM 5. Title: ... of 'the' management-invasion continuum	Thank you for your suggestion. The language will be edited in the final version.
Government of France	Summary for policymakers	24	24	639	646	Figure SPM. 5 : It would be necessary to integrate the notion of population and population scale for greater clarity and understanding of the different types of management outlined in this figure.	Thank you, in the second order draft of the SPM, we have replaced most mentions of invasive alien species by biological invasions, which hopefully addresses this comment
Kamal Kumar Rai	Summary for policymakers	24	24	639	639	Figure SPM. 5 : . Role and position of ILK must be visible	Thank you, but this is not the message of this figure (ILK can be used at any step)
Poulet, Nicolas	Summary for policymakers	24	24	639	646	Figure SPM. 5 : It would be necessary to integrate the notion of population and population scale for greater clarity and understanding of the different types of management outlined in this figure.	Thank you, in the second order draft of the SPM, we have replaced most mentions of invasive alien species by biological invasions, which hopefully addresses this comment
Robertson, Peter	Summary for policymakers	24	24	639	646	Figure SPM 5:I have real reservations about these figures although they are widely used. While they illustrate the 'typical' progression of events, they do not reflect the increasing number of cases where large scale management, particularly of vertebrates, has led to the eradication of widespread species. They therefore risk limiting the aspiration to work towards effective management at large scales as experience and improved methods become available. These also do not reflect the use of biological control, which has potential to acheive effective post establishment management in B).	Thank you for your comment. This figure represents practical management options based on the experience of invasive alien species management as covered in existing peer-reviewed and grey literature available to the assessment team. We are aware of that there are some successful management cases at widespread stage or in marine systems, but they are still regarded as exceptions. In light of showing practical solutions, we have decided not to include management experiences that have not been replicated in many areas in the figure.
Albert, Arnaud	Summary for policymakers	24	24	647	647	Suggestion to add a paragraph on funding needs: without this, no management action is possible	Thank you for your suggestion. It is now included in the paragraph in the second order draft of the SPM
Collas, Marc	Summary for policymakers	24	24	647	647	Suggestion to add a paragraph on funding needs: without this, no management action is possible	Thank you for your suggestion. In the second order draft of the SPM, it is now included in the paragraph
Government of France	Summary for policymakers	24	24	647	647	Suggestion to add a paragraph on funding needs: without this, no management action is possible	Thank you for your suggestion. It is now included in the paragraph in the second order draft of the SPM
Sarat, Emmanuelle	Summary for policymakers	24	24	647	647	Suggestion to add a paragraph on funding needs: without this, no management action is possible	Thank you for your suggestion. It is now included in the paragraph
Albert, Arnaud	Summary for policymakers	24	25	648	677	The approach is rather based on administrative boundaries. A biogeographic approach is missing in this paragraph.	Thank you, but this is not supported by the findings from the chapters as we are not aware of any literature that demonstrates either a workable or effective biogeographical approach to successful prevention/early intervention
Albert, Arnaud	Summary for policymakers	24	24	648	648	the role of early intervention should be nuanced because it is not relevant if it is not coupled with rapid detection of the species in concerned. However, this combination of rapid detection and rapid response is utopian, because in practice, when an alien species is detectable, it is already too late and the threat is already there. Moreover, rapid detection is complex and very costly. Consequently, the fact that rapid response is put forward at the same level as prevention is not justifiable from the point of view of the real situation on that field. Prevention remains the best instrument.	Thank you for this comment. We describe "preparedness" as early detection combined with rapid response, and disagree with the statement that early detection combined with rapid response is "Utopian". There are multiple case studies in the assessment where preparedness has worked and cost-effective detection systems are getting better all the time. As we also clearly state "Prevention" is not always possible hence the need for preparedness, we now believe the text is very complementary to SPM.5

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Albert, Arnaud	Summary for policymakers	24	25	648	677	There is confusion in paragraph 20 between prevention and rapid response, whereas these are well represented as distinct steps in Figure SPM.5. It would be necessary to have consistency on these aspects and a clear differentiation of these 2 intervention phases.	Thank you - prevention, rapid response and eradication have been placed in separate paragraphs to provide differentiation of these management approaches.
Albert, Arnaud	Summary for policymakers	24	24	648	677	This paragraph does not propose alternative methods. There is also a lack of evaluation of the scale and type of human, technical and financial resources required for alien invasive species management, especially in the long term.	Thank you. This paragraph focusses entirely on the benefits of “Prevention and preparedness” so its purpose is not to present other alternatives (which come in later paragraphs). The cost of long-term management can be eliminated by effective prevention (text has been added to make this clear) hence why it is important.
Evans, Thomas	Summary for policymakers	24	25	648	677	Some paragraphs would help here I think	Thank you for your comment, but the authors would appreciate clearer directions.
Fagot, Cédric	Summary for policymakers	24	25	648	677	The approach is rather based on administrative boundaries. A biogeographic approach is missing in this paragraph.	Thank you, but this is not supported by the findings from the chapters as we are not aware of any literature that demonstrates either a workable or effective biogeographical approach to successful prevention/early intervention
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	24	24	648	650	There are too many elements in the first sentence for clarity. If prevention is intended to include both prevention of introduction and prevention of establishment, then this likely means to say that where prevention has been successful it has been supported by strong policy and has delivered cost-effective results. The focus should be on sustainable outcomes; I'm not sure what "sustainable policy" would be.	Thank you, in the second order draft of the SPM, we have revised this first sentence and addressed issues following other reviewers' comments
Government of France	Summary for policymakers	24	25	648	677	The approach is rather based on administrative boundaries. A biogeographic approach is missing in this paragraph.	Thank you, but this is not supported by the findings from the chapters as we are not aware of any literature that demonstrates either a workable or effective biogeographical approach to successful prevention/early intervention
Government of France	Summary for policymakers	24	24	648	677	This paragraph does not propose alternative methods. There is also a lack of evaluation of the scale and type of human, technical and financial resources required for alien invasive species management, especially in the long term.	This paragraph is focusses entirely on the benefits of “Prevention and preparedness” so its purpose is not to present other alternatives (which come in later paragraphs). The cost of long-term management can be eliminated by effective prevention (text has been added to make this clear) hence why it is important.
Government of USA	Summary for policymakers	24	24	648	650	Could this KM be changed to something about WHAT makes policies effective, cost-effective, and sustainable?	Thank you, but authors prefer not to follow this suggestion as this paragraph around the importance of investing in prevention and preparedness is more important than a generic policy issue.
Lang, Iris	Summary for policymakers	24	25	648	677	Maybe add the fact that there can be a long delay before policies establishment (when a invasive species is detected), which can explain some limits to their efficiency (for example Kleitou et al 2021 in Jourlal of Marine Science and Engineering 9 (3), 325)	Thank you, this has been mentioned in previous paragraphs
Poulet, Nicolas	Summary for policymakers	24	24	648	648	the role of early intervention should be nuanced because it is not relevant if it is not coupled with rapid detection of the species in concerned. However, this combination of rapid detection and rapid response is utopian, because in practice, when an alien species is detectable, it is already too late and the threat is already there. Moreover, rapid detection is complex and very costly. Consequently, the fact that rapid response is put forward at the same level as prevention is not justifiable from the point of view of the real situation on that field. Prevention remains the best instrument.	Thank you for this comment. We describe “preparedness” as early detection combined with rapid response, and disagree with the statement that early detection combined with rapid response is “Utopian”. There are multiple case studies in the assessment where preparedness has worked and cost-effective detection systems are getting better all the time. As we also clearly state “Prevention” is not always possible hence the need for preparedness, we now believe the text is very complementary to SPM.5
Sarat, Emmanuelle	Summary for policymakers	24	24	648	677	This paragraph does not propose alternative methods. There is also a lack of evaluation of the scale and type of human, technical and financial resources required for alien invasive species management, especially in the long term.	This paragraph is focusses entirely on the benefits of “Prevention and preparedness” so its purpose is not to present other alternatives (which come in later paragraphs). The cost of long-term management can be eliminated by effective prevention (text has been added to make this clear) hence why it is important.
Evans, Thomas	Summary for policymakers	24	24	649	649	This isn't incorrect, but the use of 'effective' followed by 'cost-effective' is a little awkward. Maybe 'affordable' instead of 'cost-effective'?	Thank you, we have revised the text to address this point in the second order draft of the SPM
Setsaas, Trine Hay	Summary for policymakers	24	24	649	649	"sustainable policy" - does it refer to whether it is sustainable over time? in terms of money? Or relating to the environmental dimension (environmental sustainability)? And, should it be "policy measures" instead of just "policy"?	Thank you, we have removed this part from the second order draft of the SPM
Evans, Thomas	Summary for policymakers	24	24	650	651	I'm not sure what this means: 'Prevention of particular alien species is generally cost effective at reducing establishment rates and spread'	Thank you, we have clarified this sentence in the second order draft of the SPM
Kubo, Hideyuki	Summary for policymakers	24	24	650	651	I think the Figure SPM.5 is very good figures to capture overall ideas relevant to situation and managerial options and I totally agree that prevention is generally cost effective and eradication is also possible in isolated habitats through an integrated governance approach. So the writing is generally fine. It is better, however, to articulate that there are cases where prevention is already late and eradication seems to be difficult due to the infeasibility of adopting an integrated approach. In developing countries, we still have realities of local capacity shortage and inconsistency and/or temporal nature of donor funded activities. An integrated approach is difficult to operationalize under such situation. We need to raise these issues to policy makers for their recognition and renewed actions.	Thank you, this is further developed in the text. Here the figure only shows a conceptual diagram to facilitate the understanding of management-invasion continuum
Government of USA	Summary for policymakers	25	25	585	588	There are two issues here. First, not all pathogens are species. The example used here, rabbit calicivirus, is not a species. A more appropriate example should be used. Second, without the right formulation here, countries might become more reluctant to share samples or DSI related to viral pathogens that can be considered alien vs. endemic. Suggest using the following language instead: "invasive [alien] species that are or may be vectors, reservoirs, and causative agents of disease."	Thank you, this sentence has been deleted and the comment is no longer relevant.
Robertson, Peter	Summary for policymakers	25	25	648	667	This seems very optimistic. I would suggest a statement to say that current management is not dealing with the scale of the problem, all major targets have been missed and most impacts remain unmanaged.	Thank you for your comment, but this paragraph is based on evidence presented in the Assessment. We do not agree that it is optimistic. The ER does not appear to have understood fig SPM.5
Government of Ireland (Nelson, Brian)	Summary for policymakers	25	25	654	655	Does sentence starting 'Prevention..' lack 'if' before 'supported'?	Thank you. This has been corrected in the second order draft of the SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	25	25	654	655	Prevention strategies are most comprehensive <u>when</u> supported by effective introduction pathway management	Thank you. This has been corrected in the second order draft of the SPM
Government of USA	Summary for policymakers	25	25	654	655	possibly should read "Prevention strategies are most COMPREHENSIVELY supported by effective introduction pathway management"	Thank you. This has been corrected in the second order draft of the SPM
Nunes, Ana	Summary for policymakers	25	25	654	654	I believe it was meant 'comprehensively'	Thank you. This has been corrected in the second other draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Albert, Arnaud	Summary for policymakers	25	25	656	656	Preparedness through surveillance and early detection and rapid response systems is the key part to prevent dispersion and is not the key part of prevention.	Thank you. This has been corrected in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	25	25	656	657	is key to allow actors to detect...	Thank you. This has been corrected in the second order draft of the SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	25	25	656	656	Preparedness through surveillance and early detection and rapid response systems <u>are</u> the key part of prevention...	Thank you. This has been corrected in the revised version
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	25	25	658	658	line of sight refers to sections that do not exist.	Than you, this has been corrected in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	25	25	659	659	(e.g., traded species)	Thank you. This has been corrected in the second order draft of the SPM
Government of Germany	Summary for policymakers	25	25	660	660	Proposal: Please consider substituting "Managing" with "Regulating".	Thank you, this sentence has been revised accordingly in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	25	25	660	661	This could be explained a bit better. It seems counter-intuitive that a prohibited list is labelled lenient, but I think I realise what is meant. The background text in section 6.3.1.4 was looked at for more detail on these terms but no clear and obvious text on this issue was found. For example, a word search for 'lenient' in Chap 6 brings up no matches.	Thank you, this has been edited accordingly in the second order draft of the SPM
Pan, Xubin	Summary for policymakers	25	25	660	661	"prohibited (strict approach) or permitted (lenient approach)" ?	Thank you. This has been corrected in the second order draft of the SPM
Government of USA	Summary for policymakers	25	25	661	661	Unclear how prohibited is lenient and permitted is strict?	Thank you, this has been corrected in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	25	25	663	668	Enough information on the two approaches needs to be provided so that a non-expert understands the difference.	Thank you, but more information would make the message unnecessary long and could be seen as prescriptive.
Government of Ireland (Nelson, Brian)	Summary for policymakers	25	25	663	666	Strongly agree with this statement	Thank you for your feedback.
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	25	25	664	664	how rare is rare? These approaches form the evidence base from which it has been concluded that they can be effective. Something more quantitative would be appropriate.	Thank you, we have clarified this sentence in the second order draft of the SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	25	25	664	665	Pre-border equates to offshore for an island nation but surely not for countries within a continent?	Thank you, this sentence has been revised accordingly in the second order draft of the SPM
Government of USA	Summary for policymakers	25	25	669	670	Unclear how this relates - are you saying that even with human movement restrictions for COVID-19, we've still had some introductions, showing that limiting movement only has partial success?	Thank you, this sentence has been deleted from the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	25	25	670	674	Once again, this seems to suggest giving up on the marine environment, as no options are effective	Thank you. There are only a handful of cases of long-term eradication of marine IAS - all in confined/enclosed sites (bay, marina, lagoon, shellfish farm).
Government of Ireland (Nelson, Brian)	Summary for policymakers	25	25	670	671	Would argue this is also the case for connected inland water systems	Thank you, we have added connected water systems to the second order draft of the SPM
Stiger-Pouvreau, Valérie	Summary for policymakers	25	25	671	677	Regarding the enforcement of the BMW convention, it should be noted that one of the challenges is the cost to equip ships with the required material for ballast water treatment. Only some shipowners can afford it. Look at the article Fernandes et al. (2016) Costs and benefits to European shipping of ballast-water and hull-fouling treatment: Impacts of native and non-indigenous species. Marine Policy 64 (2016) 148–155 => "The estimated operational cost of NIS mitigation measures may represent between 1.6% and 4% of the annual operational cost for a ship operating on European seas, with the higher proportional costs in small ships."	Thank you, in the second order draft of the SPM, there were substantial changes made in response to this comment in the report
Karayannis, Theofanis	Summary for policymakers	25	25	672	674	The assertion made here is problematic in more than one way. Firstly, as "prevention-based agreements" it mentions "ballast water exchange and biofouling management". Ballast water exchange is only one (and interim at that) option under ballast water management and is not an 'agreement'; the word "exchange" needs to be replaced by "management". In addition, biofouling management is currently only voluntary at the global level (with mandatory local measures only in very few jurisdictions such as New Zealand and California, and shortly in Australia), therefore there cannot be any enforcement and the assertion about poor enforcement is inappropriate and moot. Finally, with regard to ballast water management, with the BWM Convention in force since 2017 and since then implemented and enforced by its Parties which represent over 91% of the global fleet, it seems quite arbitrary and unjustifiable to say that there is poor enforcement. This sentence therefore needs to be fundamentally reconsidered and corrected. (and of course there is also the usual typo showing the BWM Convention as "BMW" instead) :	Thank you, there were substantial changes made in response to this comment in the second order draft
Government of France	Summary for policymakers	25	25	674	677	There are more and more regulations at international level, so this is a step in the right direction, but the challenge is implementation and action.	Thank you, this point is further developed in the next section of the second order draft of the SPM
Massé, Cécile	Summary for policymakers	25	25	674	677	There are more and more regulations at international level, so this is a step in the right direction, but the challenge is implementation and action.	Thank you, this point is further developed in the next section of the second order draft of the SPM
Evans, Thomas	Summary for policymakers	25	25	675	676	clean safe trade and people movement - needs a comma somewhere	Thank you, this sentence has been revised in the second order draft of the SPM
Brooks, Thomas	Summary for policymakers	25	26	679	730	C21 and C22 are both very important key messages	Thank you for your feedback.
Government of France	Summary for policymakers	25	25	679	679	particularly on sparsely populated and small islands	Thank you, the evidence allows us to specify on "small islands"

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of France	Summary for policymakers	25	25	679	702	This paragraph states that eradication can be cost-efficient in isolated habitats. But what can be said in other cases? Can eradication products or practices lead to negative environmental externalities that could make it less cost-efficient? How can we approach this cost-efficiency balance in specific ecosystem contexts?	Thank you. Successful eradication cannot be attained in large land masses (mainland's) especially where the species is widespread and cannot be contained. This is especially true for plants. Also, the extent of the invasive population may be compounded by the presence of multiple species especially when the populations are interconnected.
Sigala, Pierre	Summary for policymakers	25	25	679	679	particularly on sparsely populated and small islands	Thank you, the evidence allows us to specify on "small islands"
Tassin, Jacques	Summary for policymakers	25	25	679	679	Please replace 'islands' by 'small islands'	Thank you, agreed
Evans, Thomas	Summary for policymakers	25	25	680	680	and 'for' localized incursions. Or perhaps: '... and for small, localized populations of alien species that may not spread rapidly'	Thank you, we have edited the text accordingly in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	25	26	681	699	5.5.1.3 does not exist - 5.5.4 is on eradication. Logical structure could be improved in this point.	Thank you, we have revised the text accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	25	25	681	682	urban areas' for alien forest insect species should be added	Thank you but this statement cannot be backed up by the chapter/literature assessed.
Government of USA	Summary for policymakers	25	26	681	702	It may not be possible to get buy-in from all stakeholders and trade-offs are unavoidable. This should probably be mentioned here. Also, there seems to be a heavy and perhaps overemphasis in the text on the impacts or importance of opposition groups or stakeholders, when they may represent only a small fraction of all stakeholders. Many projects have majority stakeholder support, particularly when the invasive species harbors and spreads zoonotic diseases to humans and domestic animals, but that does not seem to be discussed here or in the other documents as much as opposition groups.	Thank you, this is further developed in Chapter 6 and Section D of the second order draft of the SPM
Government of USA	Summary for policymakers	25	25	681	683	Recommend including "enclosed conservation areas".	Thank you, we do not have the evidence in the chapter to support this inclusion.
Government of USA	Summary for policymakers	25	26	681	699	Sections 5.5.1.2 and 5.5.1.3 do not exist in Chapter 5. Should this be 5.4.4.2 instead?	Thank you, we have revised the text accordingly in the second order draft of the SPM
Jactel, Hervé	Summary for policymakers	25	25	681	682	urban areas' for alien forest insect species should be added	Thank you but this statement cannot be backed up by the chapter/literature assessed.
Government of USA	Summary for policymakers	25	25	685	692	Recommend using the term "pesticide" or even "toxicant" rather than "poison." Recommend adding "hunting" to the list of successful methods.	Thank you. We have revised the text accordingly in the second order draft of the SPM
Government of USA	Summary for policymakers	25	25	688	690	This makes it sound like there haven't been any eradications of vertebrates on inhabited islands to date, but there have already been some. Sometimes it is just one species of multi-species project, but that is still a successful eradication of that invasive species. Although, perhaps there are only a few eradications to date on islands with permanent inhabitants, there are more on islands with non-permanent inhabitants. These eradications on inhabited islands required a mix of eradication methods or reliance on eradication methods such as trapping, hunting, and bait stations only.	Thank you, but vertebrates are mentioned in the sentence above.
Evans, Thomas	Summary for policymakers	25	25	689	690	willing local communities?	Thank you, we have rephrased this sentence in the second order draft of the
Evans, Thomas	Summary for policymakers	25	25	690	690	and concerns	Thank you, we have rephrased this sentence accordingly in the second order draft of the SPM
Nunes, Ana	Summary for policymakers	25	25	690	692	Which is why it is of utmost importance to consider management actions that minimise the impacts to animal welfare and that have public acceptance, at the same time of being cost-effective.	Thank you, yes agreed. This is further developed in other paragraphs of the second order draft of the SPM and in Chapters 5 and 6.
Robertson, Peter	Summary for policymakers	25	25	692	702	This is very pessimistic regarding large scale eradication on large land masses, particularly of terrestrial vertebrates, where there are an increasing number of successful programmes, together with aspirational programmes such as Predator Free New Zealand.	Thank you, we have rephrased this statement in the second order draft of the SPM
Government of Germany	Summary for policymakers	25	25	696	696	Proposal: Please consider adding "and the local communities" after "communicated amongst them".	Thank you, we have revised the text accordingly in the second order draft of the SPM
Government of Australia	Summary for policymakers	26	26	704	704	Replace "management tools and technologies" with "management tools, approaches and technologies"	Thank you, we have revised this sentence accordingly in the second order draft of the SPM
Government of Australia	Summary for policymakers	26	26	704	730	Suggest including reference to alternative AIS management approaches such nil tenure or area-wide management.	Thank you, but authors believe this is too detailed for inclusion in the SPM.
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	26	26	704	711	This section requires revision - material on the existence of effective tools would best be consolidated into a single point and aligned to a single key message. Material on emerging technologies could be placed in a separate point if need be. Specifically; the grammar in the opening sentence doesn't work - the regulation of tools has no track record in management. The responses to elements as disparate as gene editing and communications tools are so different they are not logical to combine - and calling for new technologies is not policy relevant. Technologies that don't exist yet cannot be applied.	Thank you for this suggestion - we have amended this paragraph substantially in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	26	26	704	730	Paragraph 22 is unclear. Several of the sentences seem incomplete and it has some jargon terminology that reduces clarity and meaning. Can this be reviewed and changed to plain English?	Thank you for this suggestion - we have amended this paragraph substantially in the second order draft of the SPM.
Grossart, Hans-Peter	Summary for policymakers	26	26	704	730	#22 and others. With each introduced invasive alien species you also introduce their microbiomes. Yet, we don't know much about possible consequences of it. I would like to see this mentioned somewhere...	Thank you, it is now mentioned although not covered in details in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	26	26	706	709	This sentence is long and complicated and its meaning is unclear as a result.	Thank you for this suggestion - we have amended this paragraph substantially in the second order draft of the SPM
Albert, Arnaud	Summary for policymakers	26	26	707	707	It is surprising that the message only focuses on this type of technology. It would have been interesting to talk about eDNA or other more appropriate methods for prevention. (mentions IUCN FR report). Perhaps it is necessary to better define what these tools are, as they are not well known by decision-makers.	Thank you, this has been addressed in the second order draft of the SPM. We have removed any direct mention of a particular approach as there are too many to mention here
Curd, Amélia	Summary for policymakers	26	26	707	707	It is surprising that the message only focuses on this type of technology. It would have been interesting to talk about eDNA or other more appropriate methods for prevention. (mentions IUCN FR report). Perhaps it is necessary to better define what these tools are, as they are not well known by decision-makers.	Thank you, this has been addressed in the second order draft of the SPM. We have removed any direct mention of a particular approach as there are too many to mention here
Evans, Thomas	Summary for policymakers	26	26	707	707	are needed?	Thank you, this part of the sentence has been removed and the comment is no longer relevant

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Fagot, Cédric	Summary for policymakers	26	26	707	707	It is surprising that the message only focuses on this type of technology. It would have been interesting to talk about eDNA or other more appropriate methods for prevention. (mentions IUCN FR report).Perhaps it is necessary to better define what these tools are, as they are not well known by decision-makers.	Thank you, this has been addressed in the second order draft of the SPM. We have removed any direct mention of a particular approach as there are too many to mention here
Government of France	Summary for policymakers	26	26	707	707	It is surprising that the message only focuses on this type of technology. It would have been interesting to talk about eDNA or other more appropriate methods for prevention. (mentions IUCN FR report).Perhaps it is necessary to better define what these tools are, as they are not well known by decision-makers.	Thank you, this has been addressed in the second order draft of the SPM. We have removed any direct mention of a particular approach as there are too many to mention here
Pellens, Roseli	Summary for policymakers	26	26	707	707	It is surprising that the message only focuses on this type of technology. It would have been interesting to talk about eDNA or other more appropriate methods for prevention. (mentions IUCN FR report).Perhaps it is necessary to better define what these tools are, as they are not well known by decision-makers.	Thank you, this has been addressed in the second order draft of the SPM. We have removed any direct mention of a particular approach as there are too many to mention here
Poulet, Nicolas	Summary for policymakers	26	26	707	707	It is surprising that the message only focuses on this type of technology. It would have been interesting to talk about eDNA or other more appropriate methods for prevention. (mentions IUCN FR report).Perhaps it is necessary to better define what these tools are, as they are not well known by decision-makers.	Thank you, this has been addressed in the second order draft of the SPM. We have removed any direct mention of a particular approach as there are too many to mention here
Government of Mexico (Saad Alvarado, Laura)	Summary for policymakers	26	26	710	710	After (well established) {5.4} I kindly suggest add the following paragraph: Technologies, tools and approaches that can be used are the following: Public engagement tools, technologies & databases: a) Stakeholder community engagement frameworks, training, & risk communication platforms, b) Citizen surveillance – crowdsourcing, c) Citizen surveillance – data input portals, d) Invasive alien species management relevant databases and analytics. Surveillance, detection, monitoring and response technologies: a) Earth observation – remote sensing detection, b) Robotic technology for targeted management measures, c) Sensor-networks – internet of things, d) Volatile detection technologies. Screening technologies: a) Imaging, optical, movement sensors & telemetry, b) Acoustic/ultrasound sensors, c) Environmental DNA, d) Sentinel surveillance & monitoring. Decision support tools: a) Policy levers, management systems & evaluation tools, b) Quantitative decision support tools. Future diagnostic technologies: a) Biosensors & nanotechnology sensors, b) Clustered regularly interspaced short palindromic repeats (CRISPR) diagnostics, c) Multiplex handheld real-time diagnostics, d) Disease mRNA biomarkers, e) Track and trace genomics. Control technologies: a) Chemical, mechanical & manual approaches, b) Biological Control.	Thank you. We have removed any direct mention of a particular approach as there are too many to mention here. This level of detail is provided very clearly in the chapters
Furukawa, Takuya	Summary for policymakers	26	26	711	711	Please check if the reference "{C18}" is correct, and add a confidence level.	Thank you, this has been corrected in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	26	26	713	718	Very long sentence	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Germany	Summary for policymakers	26	26	713	718	Proposal: please consider splitting the sentence. For example: "For all new technologies ... development". "This allows ...".	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Switzerland	Summary for policymakers	26	26	713	730	The precautionary approach must not only be maintained but reinforced. For new technologies, where the selection process of a population / species as well as non targeted populations/species is or may be deeply affected (Ex: gene Drive) by a negative selection process (death of individuals or population or species) the precautionary approach must be strictly implemented before the use of such "management measures. In the case of irreversible effects onto the biodiversity, the level of precaution has to be very high. Many countries regulate the use of biotechnology in order to protect biodiversity. Directly modifying (genetic engineering) the elements of biodiversity undermines the image of biodiversity as stated in their protection goals. For Switzerland the use of gentechnologie on wild organisms is not fusible with the mission of environment and biodiversity protection. This § is biased.It does not represent the state of the debate by the CBD as well as by the IUCN. At the moment there is NO consensus (scientific, regulatory and political) the use of gene technology is a management measure of IAS.	Thank you for this suggestion - we have amended this paragraph substantially in the second order draft of the SPM in response to the comment
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	26	26	718	721	This is asserted without supporting evidence. The suggestion that increased transparency will automatically lead to acceptance is in contrast to emerging findings from behavioural sciences, which suggest that increased education is a not a strong motivator for change. An example review article: DOI: 10.1126/science.aal1931	Thank you for this comment. The paragraph has been significantly revised in the second order draft of the SPM to address these issues. The evidence from multiple peer-reviewed studies, reports and papers on the value and importance of transparency is captured in the chapter along with counter views. We are dealing with a contested space in which the right path forward is still illusive. The statement is not policy-prescriptive and is supported by evidence so may not be seen as controversial
Evans, Thomas	Summary for policymakers	26	26	721	723	The term 'most countries' is used twice in this sentence? Delete second use? Also 'which would constitute'...?	Thank you, this has been corrected in the second order draft of the SPM
Government of Argentina	Summary for policymakers	26	26	721	723	This sentence is not correctly finalized	Thank you, this has been corrected in the second order draft of the SPM
Government of Argentina	Summary for policymakers	26	26	721	723	We recommend to delete the references to regulatory frameworks of biotechnology and limit to reference how biotechnology can help the combat against invasive alien species. This assessment is supposed to review information regarding invasive alien species and their management, not to indicate adequate policies to assess biotechnology in general	Thank you for this suggestion - we have amended this paragraph substantially in the second order draft of the SPM
Government of France	Summary for policymakers	26	26	721	723	"Most countries..." : the end of this sentence is lacking	Thank you, this has been corrected in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	26	26	721	724	the sentence starting 'Most countries...' on line 721 is incomplete. And is it National Science academies?	Thank you, this has been corrected in the second order draft of the SPM
Government of Norway (Vik, Nina)	Summary for policymakers	26	26	721	723	Is a part of the sentence missing? Should the sentence end after "technology development"? That would make sense.	Thank you, this has been corrected in the second order draft of the SPM
Nunes, Ana	Summary for policymakers	26	26	721	723	Sentence perhaps incomplete, not clear.	Thank you, this has been corrected in the second order draft of the SPM
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	26	26	722	722	There is an extra 'in most countries' that can be deleted. C22 is far too long and needs to be more concise.	Thank you, this has been corrected in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Germany	Summary for policymakers	26	26	723	728	Need for clarification: The last part of this sentence (l. 721-723) is missing. There seems to be something missing/ wrong in this sentence (l. 727-728). For a better understanding consider reformulating the sentence. For example: Nation academies and international institutions and conventions (e.g. International Union for Conservation of Nature (IUCN) and the Convention on Biological Diversity (CBD)) have reviewed the potential benefits and risks of biotechnology with regard to conservation benefits and have proposed genetic solutions for the management of invasive alien species. However, benefits and risks of biotechnology in the field of nature conservation are still internationally debated.	Thank you, the paragraph has been significantly revised in the second order draft of the SPM address these issues
Government of UK (Mortimer, Diana)	Summary for policymakers	26	26	723	723	not sure what 'which would constitute' is referring to at the end of this sentence.	Thank you, this has been corrected in the second order draft of the SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	26	26	723	723	"which would constitute".... End of the sentence is missing - which would constitute what?	Thank you, this has been corrected in the second order draft of the SPM
Pan, Xubin	Summary for policymakers	26	26	723	723	"which would constitute?"	Thank you, this has been corrected in the revised version of the second order draft of the SPM
Furukawa, Takuya	Summary for policymakers	26	26	728	730	The tone of the statement ("Once proven effective...", "... may prove effective...") does not sound like this is established. Either rephrase the statement or change the confidence level.	Thank you, this sentence has been rephrased in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	26	26	728	730	There is a circularity here: effective technologies should prove to be effective.	Thank you, this sentence has been rephrased in the second order draft of the SPM
Government of Germany	Summary for policymakers	26	26	728	730	Proposal: This statement assumes that biotechnology might offer effective and low-risk technologies. It is currently unclear if such technologies will play a significant role in combating invasive alien species. It should be noted that gene editing and gene drives in wild living populations, which would be subsumed here, might never reach the desired status. We strongly recommend to consider rephrasing this sentence: "It remains unclear whether some of those technologies can be developed to be both effective and low-risk. If such a development is possible, their effective context-specific [...]". Adding to this and at the same time recalling the discussion at the NFP-dialogue for this review, it must be assured that potential (!) benefits and risks are not biased.	Thank you for this comment. In the second order draft of the SPM, we have removed any explicit mention of these gene-editing technologies as this detracts from the many other approaches, tools and technologies that are under development to support IAS prevention and management
Albert, Arnaud	Summary for policymakers	26	26	731	731	Decision-makers may ask about exploitation as a means of regulation. Proposal to include a paragraph on the benefits and limitations of economic exploitation of invasive alien species, especially when eradication is impossible and the invasion is too severe. (example of the Brest crepidula). However, the proposal must be measured as it should not be based on an opportunistic approach. If the experts choose to develop the economic valuation aspects, the messages presented must also include the associated risks. Examples of known cases of crayfish or blue crabs. See for example IUCN French Committee. 2018. Making use of invasive alien species settled in natural environments. An effective approach to management? An initial analysis and discussion of points requiring attention. France. 84 pages. http://especes-exotiques-envahissantes.fr/wp-content/uploads/2019/07/uicn-guide-eee-ang-m3.pdf	Thank you, this is covered but authors think the SPM is not the place for a discussion on this
Kamal Kumar Rai	Summary for policymakers	26	26	731	731	It is important to highlight the inclusion of customary laws, systems of IPLCs including Free, Prior and Informed Consent, full and effective participations at all levels, and mechanisms of socio-economic and cultural consideration for EIAs.	Thank you, this has been added in the second order draft of the SPM
Poulet, Nicolas	Summary for policymakers	26	26	731	731	Decision-makers may ask about exploitation as a means of regulation. Proposal to include a paragraph on the benefits and limitations of economic exploitation of invasive alien species, especially when eradication is impossible and the invasion is too severe. (example of the Brest crepidula). However, the proposal must be measured as it should not be based on an opportunistic approach. If the experts choose to develop the economic valuation aspects, the messages presented must also include the associated risks. Examples of known cases of crayfish or blue crabs. See for example IUCN French Committee. 2018. Making use of invasive alien species settled in natural environments. An effective approach to management? An initial analysis and discussion of points requiring attention. France. 84 pages. http://especes-exotiques-envahissantes.fr/wp-content/uploads/2019/07/uicn-guide-eee-ang-m3.pdf	Thank you, this is covered but authors think the SPM is not the place for a discussion on this
Sarat, Emmanuelle	Summary for policymakers	26	26	731	731	Decision-makers may ask about exploitation as a means of regulation. Proposal to include a paragraph on the benefits and limitations of economic exploitation of invasive alien species, especially when eradication is impossible and the invasion is too severe. (example of the Brest crepidula). However, the proposal must be measured as it should not be based on an opportunistic approach. If the experts choose to develop the economic valuation aspects, the messages presented must also include the associated risks. Examples of known cases of crayfish or blue crabs. See for example IUCN French Committee. 2018. Making use of invasive alien species settled in natural environments. An effective approach to management? An initial analysis and discussion of points requiring attention. France. 84 pages. http://especes-exotiques-envahissantes.fr/wp-content/uploads/2019/07/uicn-guide-eee-ang-m3.pdf	Thank you, this is covered but authors think the SPM is not the place for a discussion on this
Stiger-Pouvreau, Valérie	Summary for policymakers	26	26	731	731	Decision-makers may ask about exploitation as a means of regulation. Proposal to include a paragraph on the benefits and limitations of economic exploitation of invasive alien species, especially when eradication is impossible and the invasion is too severe. (example of the Brest crepidula). However, the proposal must be measured as it should not be based on an opportunistic approach. If the experts choose to develop the economic valuation aspects, the messages presented must also include the associated risks. Examples of known cases of crayfish or blue crabs. See for example IUCN French Committee. 2018. Making use of invasive alien species settled in natural environments. An effective approach to management? An initial analysis and discussion of points requiring attention. France. 84 pages. http://especes-exotiques-envahissantes.fr/wp-content/uploads/2019/07/uicn-guide-eee-ang-m3.pdf	Thank you, this is covered but authors think the SPM is not the place for a discussion on this
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	26	26	732	732	It would be more correct to say that long-term monitoring is critical to support the learn-as-you-go approach needed to successfully manage a complex issue with incomplete information	Thank you, but we think if we change the title according to the comment will be more confusing to understand the idea of the paragraph. The “learn as you go” is not treated in that way in Chapter 5, and it is seems more related to adaptive management

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Germany	Summary for policymakers	26	26	732	732	Proposal: Please consider adding "under climate change" after "management actions", as climate change is an important factor influencing the monitoring and management of invasive alien species (Finch, D. M., Butler, J. L., Runyon, J. B., Fetting, C. J., Kilkenny, F. F., Jose, S., Frankel, S. J., Cushman, S. A., Cobb, R. C., Dukes, J. S., Hicke, J. A., Amelon, S. K. 2021. Effects of climate change on invasive species. Pages 57-84. Chapter 4 in: Invasive species in forests and rangelands of the United States. Editors: Poland, T. M., Patel-Weynand, T., Finch, D. M., Ford Miniati, C., Hayes, D. C., Lopey, V. M. Springer)	Thank you, we respectfully decline your suggestion as we would like to avoid this message to be restricted to climate change only. This is a general statement.
Grossart, Hans-Peter	Summary for policymakers	26	26	732	741	Please highlight the power of genetic monitoring, e.g. eDNA or shot gun metagenome sequencing, etc.	Thank you, we have highlighted these tools elsewhere in the second order draft of the SPM
Kubo, Hideyuki	Summary for policymakers	26	26	732	741	It's true but difficult to operationalize in many of developing countries. It would be better if alternative actions might be proposed when a country faces difficulties in human capacity and financing.	Thank you, it is true and effective decision-making frameworks are available for many contexts (see previous paragraphs)
Government of France	Summary for policymakers	26	26	734	734	Mention remote sensing for forest ecosystems	Thank you for your comment, we think that mentioning specific tools for specific ecosystems will be a bias. And it is not the intention of the paragraph. Actually we deleted the details of specific technologies and tools in other paragraphs
Jactel, Hervé	Summary for policymakers	26	26	734	734	Mention remote sensing for forest ecosystems	Thank you for your comment, we think that mentioning specific tools for specific ecosystems will be a bias. And it is not the intention of the paragraph. Actually we deleted the details of specific technologies and tools in other paragraphs
Government of Germany	Summary for policymakers	26	26	735	735	Proposal: Please consider adding "and reintroductions" after "novel introductions".	Thank you, we have revised the sentence accordingly in the second order draft of the SPM
Bortolus, Alejandro	Summary for policymakers	26	26	736	736	It is confusing and unclear why "terrestrial" and "inland" ecosystems are separated here. Also, it is not clear why marine and coastal ecosystems are not even mentioned.	Thank you, we have clarified this point in the second order draft of the SPM
Government of UK (Mortimer, Diana)	Summary for policymakers	26	26	736	736	it says 'when warranted' - would be useful to clarify if that refers to eg 'economically warranted' or something else.	Thank you, It encompasses all situations for e.g., ecologically and economically warranted.
Evans, Thomas	Summary for policymakers	26	26	741	741	for local communities (delete the)	Thank you, this has been addressed in the second order draft of the SPM.
Collas, Marc	Summary for policymakers	27	27	743	757	It is important to consider all types of stakeholders, not only local and indigenous people, for their involvement in the management and decision-making process to combat alien invasive species. The wording is confusing.	Thank you, we have rephrased this sentence in the second order draft of the SPM
Fagot, Cédric	Summary for policymakers	27	27	743	757	The last sentence remains rather vague and the issues presented are implied. It would be wise to go further on the risks of socio-economic valorisation.	Thank you, we have clarified the last sentence in the second order draft of the SPM
Fagot, Cédric	Summary for policymakers	27	27	743	757	There is a lack of information on compensation issues for losses related to the management of alien invasive species as a resource (example of compensation made for the closure of American mink farms). To be adapted according to the economic and social context.	Thank you, this is addressed in Section A of the second order draft of the SPM
Government of Australia	Summary for policymakers	27	27	743	743	Replace "Stakeholder-led adaptive" to "Adaptive co-management of"	Thank you, we have rephrased this sentence accordingly in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	27	27	743	748	section 6.4 includes discussion of the value of stakeholder engagement, but given the many failures documented in 6.4.2 and factors discussed in 6.4.4.4, a confidence level of well-established seems unwarranted. Both section 5.2.1 and 6.4 show that stakeholder engagement can be effective, but neither section shows that it is the most effective basis. Section 5.5.1.2 cited as support for the following sentence does not exist.	Thank you for this suggestion - we have altered the confidence statement in the second order draft of the SPM
Government of France	Summary for policymakers	27	27	743	743	"wide ownership": this term could be explained and clarified.	Thank you, this has been clarified in the second order draft of the SPM
Government of France	Summary for policymakers	27	27	743	757	The last sentence remains rather vague and the issues presented are implied. It would be wise to go further on the risks of socio-economic valorisation.	Thank you, we have clarified the last sentence in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	27	27	743	757	This paragraph 24 is extremely hard to follow, very jargon heavy. Can it be simplified and expressed in simpler language?	Thank you, we have simplified the language and made the SPM more accessible.
Government of USA	Summary for policymakers	27	27	743	743	Should stakeholder led be changed to stakeholder supported? I could imagine in many cases that stakeholders do not lead the actual management activities, but are actively involved in the process and decisions.	Thank you, we have rephrased this sentence accordingly in the second order draft of the SPM
Hipeau, Elisabeth	Summary for policymakers	27	27	743	757	It is important to consider all types of stakeholders, not only local and indigenous people, for their involvement in the management and decision-making process to combat alien invasive species. The wording is confusing.	Thank you, we have rephrased this sentence in the second order draft of the SPM
Hudin, Stéphanie	Summary for policymakers	27	27	743	757	It would be more understandable if local and indigenous people were presented as administrators of their territories.	Thank you for your comment. It could be more understandable, but this reflexion goes beyond the scope of this assessment.
Hudin, Stéphanie	Summary for policymakers	27	27	743	757	The last sentence remains rather vague and the issues presented are implied. It would be wise to go further on the risks of socio-economic valorisation.	Thank you, we have clarified the last sentence in the second order draft of the SPM
Jactel, Hervé	Summary for policymakers	27	27	743	743	"wide ownership": this term could be explained and clarified.	Thank you, this has been clarified in the second order draft of the SPM
Kubo, Hideyuki	Summary for policymakers	27	27	743	757	Again, it's true but not easy to operationalize in many of conservation bureaucracy in developing countries due to shortage of human capacity and finance. It would be better if alternative actions might be proposed under such difficult conditions.	Thank you, it is true and effective decision-making frameworks are available for many contexts (see previous paragraphs)
Maillard, Jean-François	Summary for policymakers	27	27	743	757	There is a lack of information on compensation issues for losses related to the management of alien invasive species as a resource (example of compensation made for the closure of American mink farms). To be adapted according to the economic and social context.	Thank you, this is too detailed for the SPM but mentioned in the chapters
Setsaas, Trine Hay	Summary for policymakers	27	27	743	757	Co-development and implementation (especially from economic sectors) of adaptive invasive alien species management is a recommendation of importance. Should consider moving this element to the key messages in order to reach target groups of relevance in cross-sectoral policy.	Thank you, agreed
Bortolus, Alejandro	Summary for policymakers	27	27	746	757	This section should highlight that in many/most regions worldwide, \$\$ funding is the critical factor determining whether stakeholders are able to get involved or not, regardless of their willingness to do so. Such statement should be linked to page 28, lines 772-775 ("However.... (Target 15.8)").	Thank you, this issue is taken up in a different paragraph of the second order draft of the SPM
Tassin, Jacques	Summary for policymakers	27	27	748	750	That should also include the necessity to take into account the perception of biological invasions by all the stakeholders, not only the scientific one.	Thank you. Agreed, but it is implicit in the stakeholder concept. Stakeholders are not only scientists!
Evans, Thomas	Summary for policymakers	27	27	750	750	These are under development? Not sure what this means?	Thank you, we have clarified this sentence in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of France	Summary for policymakers	27	27	750	750	It is difficult to understand what is implied by the phrase "these are under development".	Thank you, we have clarified this sentence in the second order draft of the SPM
Government of Canada (Fraleigh, Brad)	Summary for policymakers	27	27	760	782	Background para 26 does not appear to be connected to any of the Key Messages In Section D. So what is it background to?	Thank you, we have corrected this in the second order draft of the SPM.
Curd, Amélia	Summary for policymakers	28	36	758	1018	This section generally lacks concrete options and actionable measures. Readers do not close the SPM with a clear idea of what they can do to take action against IAS.	Thank you. In the second order draft of the SPM, we have added a table with concrete management actions and we have revised this section, which is now more solution-oriented
Government of France	Summary for policymakers	28	36	758	1018	Chapter 6 is rich with relevant information on how to improve the implementation of IAS policies, focusing on specific sectors and stakeholders. This should be brought up in the SPM. E.g. for custom officers, e-commerce... It could be organized in a table, along the levers identified in paragraph 34 and in Figure SPM.7. The table should highlight which current tools have a potential for improvement (e.g., through better implementation or enforcement) as a priority.	Thank you, we have improved the SPM and brought more tangible solutions, including in management and policies
Government of France	Summary for policymakers	28	36	758	1018	Overall, this section is a good discussion on the main challenges regarding the governance of IAS.	Thank you for your feedback.
Government of France	Summary for policymakers	28	36	758	1018	This section generally lacks concrete options and actionable measures. Readers do not close the SPM with a clear idea of what they can do to take action against IAS.	Thank you. In the second other draft of the SPM, we have added a table with concrete management actions and we have revised this section, which is now more solution-oriented
Government of Germany	Summary for policymakers	28	28	758	759	Need for clarification: Please review the wording of "D" for it to become clearer/accurate. In this realm, it is suggested to add "negative" in front of impacts..	Thank you for this comment, where appropriate, we have inserted "negative" in front of impacts in the second order draft
Government of Japan	Summary for policymakers	28	36	758	1018	To ensure shared responsibility across sectors (indigenous, community and industries) is already mentioned in the SPM. However, other responsibility and collaboration between exporting countries and importing countries of commodities are not mentioned at all in the SPM (except multilateral agreements/frameworks and information-sharing). Such a viewpoint is already described in Chapter 6 (e.g., 6.3.2.1 about the responsibility of exporting countries and 6.5.4 about collaboration between exporting countries and importing countries) but has been rarely discussed in global discussions such as the Convention on Biological Diversity. In other words, such points can increase the value of the SPM for policy-making and should be added explicitly in the SPM.	Thank you, we have revised this section accordingly and reduced the overlaps in the second order draft of the SPM
Pellens, Roseli	Summary for policymakers	28	36	758	1018	Chapter 6 is rich with relevant information on how to improve the implementation of IAS policies, focusing on specific sectors and stakeholders. This should be brought up in the SPM. E.g. for custom officers, e-commerce... It could be organized in a table, along the levers identified in paragraph 34 and in Figure SPM.7. The table should highlight which current tools have a potential for improvement (e.g., through better implementation or enforcement) as a priority.	Thank you, we have improved the SPM and brought more tangible solutions, including in management and policies
Pellens, Roseli	Summary for policymakers	28	36	758	1018	Overall, this section is a good discussion on the main challenges regarding the governance of IAS.	Thank you for your feedback.
Bortolus, Alejandro	Summary for policymakers	28	28	760	763	Although I agree with it, this statement sounds too vague to end with "well established". I suggest to merge it with the next sentence, for clarity.	Thank you, this has been revised accordingly in the second order draft of the SPM
Brooks, Thomas	Summary for policymakers	28	28	760	760	Add "and Sustainable Development Goal Target 15.8" after mention of Aichi Target 9. The traceable account is {6.1.3}.	Thank you - we have made this change in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	28	29	760	814	This contains some material repeated from earlier in the SPM and it is not clearly linked to statement D. Lines 760-761 are a clear and concise statement of a key message, and could perhaps be used as the main statement for A2. Lines 799-802 refer to the success of countries that are not mentioned in section 6.3.2.1 (eg Japan, South Africa). Lines 802-805 lack a line of sight and confidence statement.	Thank you, we have reduced the overlaps in the second order draft of the SPM
Government of Germany	Summary for policymakers	28	28	760	802	Proposal: Please consider discussing the new IAS target under the post-2020 global biodiversity framework which will hopefully be adopted in 2022.	Thank you, these will only be discussed if published before the assessment is approved
White, Michael	Summary for policymakers	28	28	760	763	None of the Aichi Targets were completed by 2020. More money & resources will be thrown at them now!	Thank you for your feedback.
Romero, José A.	Summary for policymakers	28	28	763	763	The SPM lacks a general message on the situation of invasive alien species, which could be introduced here: "Invasive alien species are progressing and for some species and in areas areas the situation may be irreversible, but in many other situations action is possible to prevent their spread and negative impacts."	Thank you, this is included in section A of the second order draft of the SPM
Government of France	Summary for policymakers	28	28	764	766	One quarter (~ 200) of all island eradications of invasive alien mammals took place after 2010.	Thank you, but this statement has been deleted from the second order draft of the SPM
Karayannis, Theofanis	Summary for policymakers	28	28	764	767	The number of Parties is not that relevant as the most important criterion for IMO conventions, which apply to individual ships, is the percentage of the global fleet covered by the Parties. Moreover, any comparison with 2010 is not meaningful in any way as the BMW Convention only entered into force in September 2017 (which, by the way, in fact means that it did not have any Parties at all before that time as a convention only has Parties when it is in force). If the intention of this sentence is to indicate an example of 'recent progress', then what would be both more meaningful and more correct would be to say that, since September 2016 when the convention's ratification reached the 35% global tonnage requirement leading to its entry into force 12 months later, the relevant figure has by now reached over 91%.	Thank you, we have revised this statement accordingly in the second order draft
Pellens, Roseli	Summary for policymakers	28	28	764	766	One quarter (~ 200) of all island eradications of invasive alien mammals took place after 2010.	Thank you, but this statement has been deleted from the second order draft of the SPM
Collas, Marc	Summary for policymakers	28	28	772	773	"Many countries have little to no funding allocated for invasive alien species prevention and control." This is a critical issue for the effectiveness of current governance of IAS. This should be highlighted in bold in a dedicated paragraph. There are also links with section C to be made.	Thank you, this has now been included in a paragraph on gaps in the second order draft of the SPM
Government of France	Summary for policymakers	28	28	772	773	"Many countries have little to no funding allocated for invasive alien species prevention and control." This is a critical issue for the effectiveness of current governance of IAS. This should be highlighted in bold in a dedicated paragraph. There are also links with section C to be made.	Thank you, this has now been included in a paragraph on gaps in the second order draft of the SPM
Government of Mexico (Koleff, Patricia)	Summary for policymakers	28	28	772	774	Also include no funding for resarch and infrastructures (including mantaining and update data and bioinformatic tools)	Thank you, this has now been included in a paragraph on gaps in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of UK (GB Non- native Species Secretariat)	Summary for policymakers	28	28	772	775	'many countries have little or no funding.....' this is a key point that does not come across in the Key Messages.	Thank you, this has now been included in a paragraph on gaps of the second order draft of the SPM
Government of France	Summary for policymakers	28	28	774	775	It should be noted that both the Aichi Biodiversity Target 9 and Target 15.8 of the SDGs were set for 2020. While the new targets have not been adopted by the time of this review, this is strange to take an outdated target as a benchmark. At least consider writing "most national IAS targets lacked ambition relative to...". It would be informative for policymakers to discuss here whether those targets (which were missed) are still relevant and what we should aim for as early as possible.	Thank you, this has been updated in the second order draft of the SPM after COP-15
Karayannis, Theofanis	Summary for policymakers	28	28	774	775	More of a broader observation than a comment on this document as such. It may be worth noting that the only target about IAS in the SDGs is Target 15.8, under SDG 15 which is about land, while there is nothing on IAS under SDG 14 (Life Below Water) and therefore nothing about IAS in the marine realm in the SDGs. While this Assessment would of course not want to be seen to criticise the SDGs, this point may be worth noting in the already-noted context of 'pro-terrestrial bias' in all discussions about IAS. [It is noted that this point is highlighted in Chapter 5 (see related comment in row 32 below) but it could be worth capturing in the Summary as well.]	Thank you, the text on SDGs has been revised in the second order draft of the SPM
Government of France	Summary for policymakers	28	28	777	777	Delete "available" on this line. This is redundant with the end of the sentence that says data is largely unavailable.	Thank you for this comment - we have made the change in the second order draft of the SPM
Government of France	Summary for policymakers	28	28	780	781	It would be useful to discuss briefly here why there is such uncertainty and what policymakers can do to overcome this barrier and generate relevant information.	Thank you, this has been addressed in the second order draft of the SPM, noting the space constraints
Brooks, Thomas	Summary for policymakers	28	28	783	783	Some of the material from {6.1.3} showing progress in policy responses to IAS (Figs 6.2, 6.3, 6.4, 6.5) as per SDG indicator 15.8.1 could be powerfully included here as a new Figure. This is clearly important in its own right, and doubly so as a hook to THE highest level IAS policy the world has in hand; the data are derived from, and directly relevant to countries, as the IPBES Membership and most immediate audience of the IAS Assessment. It would also add some strong data-driven visualisation into what are currently quite a conceptual set of figures in the SPM.	Thank you, such data can be find in chapter 6
Brooks, Thomas	Summary for policymakers	28	29	784	814	Would be useful to add a cross-reference to Sustainable Development Goal Target 15.8 here, as a key policy lever. The traceable account is {6.1.3}.	Thank you but this is covered in a different paragraph of the second order draft of the SPM
Government of Finland (Niemivuo-Lahti, Johanna)	Summary for policymakers	28	29	784	814	(and other similar places): Please add Bern Convention (Bern Convention Convention on the Conservation of European Wildlife and Natural Habitats)	Thank you, but all these examples have been deleted to focus more on the key messages
Government of France	Summary for policymakers	28	28	784	785	The sentence in bold seems an awkward phrasing. Could it be simplified as "... and resources for managing invasive alien species threats are often inadequate" or "... and ressources to address invasive aliens species threats are often inadequate"?	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	28	29	784	814	This paragraph 26 has an important message but is lost in the list of organisations and the poor first sentence. Can this be simplified?	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Japan	Summary for policymakers	28	29	784	814	"Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species" was also another agreed indicator to measure progress towards Aichi Biodiversity Target 9 as well as SDG target 15.8. Nonetheless, Global Biodiversity Outlook 5 could not show the progress in this context well. Furthermore, "proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species" is now considered as one of the complementary indicators to assess the progress towards Target 6 of the post-2020 Global Biodiversity Framework. Thus, there is room to elaborate this point in the SPM of the current assessment. For instance, Figure 6.3 and/or 6.4 in Chapter 6 and similar figures may be relevant to policy-making and should be included (possibly linked to paragraph 26.) in the SPM. Otherwise, the SPM will fail to show any figure about progress of practical measures against invasive alien species.	Thank you, such data can be find in chapter 6
Brooks, Thomas	Summary for policymakers	28	28	785	785	The framing to C26 is a bit too negative. Suggest adding "essential but" to read "...are essential but often inadequate...".	Thank you, this has been revised accordingly in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	28	28	787	794	Do you need to list all these organisations here?	Thank you, this has been revised accordingly in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	28	28	788	788	Caps for Diversity	Thank you, this has been addressed in the second order draft of the SPM.
Government of Switzerland	Summary for policymakers	28	28	788	793	We suggest to start the listing with International Agreements (e.g. Convention on Biological Diversity (CBD), International Plant Protection Convention (IPPC)) and then organisations (FAO, IMO). Currently both are mixed. In addition we wonder why the Sanitary and Phytosanitary Agreement (SPS) of WTO is not specifically mentionned ? Last but not least why is CITES not mentionned here at least under the part "tangentially" ?	Thank you, the list has been deleted, following other reviewers' comments
Government of Switzerland	Summary for policymakers	28	28	792	792	What is meant by Codex ? Codex Alimentarius ?	Thank you. Yes, but this has been removed for more clarity
Government of UK (GB Non- native Species Secretariat)	Summary for policymakers	28	28	794	795	'Only around 20% of countries.....' This needs to be stressed in the Key Messages	Thank you, this has been addressed accordingly in the second order draft of the SPM
Government of Germany	Summary for policymakers	28	28	798	801	Proposal: With regard to the fact that the EU is a project of regional integration it is suggested that the sentence is either specified by adding " <u>member states</u> of the European Union" or by also mentioning " <u>regional scale strategies</u> ".	Thank you - this has been deleted from the second order draft of the SPM and the comment is no longer relevant
Kamigawara, Kenji	Summary for policymakers	28	28	799	800	The word, 'the UK', should be added to the names of the countries, because the UK had been the leading country in the EU in this policy field, but now not the member state of the EU.	Thank you - this has been deleted and the comment is no longer relevant
Government of France	Summary for policymakers	28	28	800	800	Is the European Union so successful? Section 6.3.2.1 (Box 6.9) presents the EU Regulation on IAS and says that it follows expert advice on IAS, but it does not show evidence that the outcome of the implementation of the regulation was successful (less introductions or less spreading of IAS). Please revise accordingly in the SPM or provide another section reference where this is more clearly evidenced.	Thank you - this has been deleted and the comment is no longer relevant

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of UK (Sarah Webster, Defra)	Summary for policymakers	28	28	800	800	Include the UK here? Effective strategy and legislation in place	Thank you - this has been deleted and the comment is no longer relevant
Government of Ireland (Nelson, Brian)	Summary for policymakers	28	29	802	805	Strongly agree with this statement	Thank you for your feedback.
Government of USA	Summary for policymakers	29	29	721	723	sentence starting "Most countries have specific..." seems to be missing something at the end "...do not generally keep up with technology development in most countries, which would constitute."	Thank you, this has been corrected in the second order draft of the SPM
Government of USA	Summary for policymakers	29	29	723	728	is CITES (convention on international trade of endangered species) also involved in this? If so, may want to mention	Thank you, we do not have the evidence in the chapter to support this inclusion.
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	29	29	804	805	'.....inadequate enforcement capacity.' This needs to be stressed in the Key Messages.	Thank you, this has been addressed accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	29	29	805	805	"Changing attitudes on the importance and urgency of the problem": shouldn't it be about different or changing perceptions of the problem in section 1.5.?? We did not find information on changing attitudes in the section referenced here.	Thank you, this has been corrected in the second order draft of the SPM
Government of Norway (Fontaine, Eva Hauge)	Summary for policymakers	29	29	809	814	Consider being more explicit on the need to incorporate IAS into climate change policies. The SPM recognises that the impacts of IAS are being compounded by a changing climate but are less clear that policy responses addressing these issues need to take into account the link between the two.	Thank you - this has been mentioned multiple times, but language has been revised to clarify
Collas, Marc	Summary for policymakers	29	29	816	836	Monitoring of ecological communities is critical to be able to design the right responses to IAS. However, we lack guidance on how to establish the monitoring networks, or what indicators to use. Since the harmonization of indicators is critical for the success of the monitoring, it should be highlighted in a dedicated key message that this is a priority knowledge gap, as per several occurrences in Table SPM.1.	Thank you, monitoring is now further addressed in the summary for policymakers (especially section C)
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	29	29	816	818	Line-of-sight for this statement is too broad to be useful. The sentence could be removed and the following sentence used as the headline.	Thank you, this has been resolved across the second order draft of the SPM
Government of France	Summary for policymakers	29	29	816	836	Monitoring of ecological communities is critical to be able to design the right responses to IAS. However, we lack guidance on how to establish the monitoring networks, or what indicators to use. Since the harmonization of indicators is critical for the success of the monitoring, it should be highlighted in a dedicated key message that this is a priority knowledge gap, as per several occurrences in Table SPM.1.	Thank you, monitoring is now further addressed in the summary for policymakers (especially section C)
Government of France	Summary for policymakers	29	29	816	836	The approach presented in this paragraph is very top-down while our experience as a subnational government (at the scale of a French region) is that a bottom-up approach would make more sense. National strategies are too general and they are not so helpful in guiding the needs of local governments to address IAS. If local scales can instead input with their lists of IAS, their successful management measures and their needs to national strategies, those will be more responsive and more easily implemented on the ground.	Thank you, stakeholder engagement and other bottom-up strategies are addressed in other paragraphs
Government of Germany	Summary for policymakers	29	29	816	818	Proposal: Could this message be made more concrete by providing a non-prescriptive recommendation for further developing specific national policies for addressing IAS, in addition to general statements on benefits of IAS (related) policies while referring to policies where IAS is a component?	Thank you, we have revised this paragraph accordingly in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	29	29	816	836	Repetition of 'invasive alien species' in overarching first sentence. The second use could be deleted without losing meaning. In next sentence should this read 'Strategies enabling...include....'. Again language could be simpler. For instance 'the efficiency of deployment of limited resources' could become simply 'the use of limited resources'. The last sentence is not clear to us. If the outputs and outcomes are being monitored suggests that they are being translated into action.	Thank you, we have revised this paragraph accordingly in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	29	29	816	836	Strongly agree with this statement	Thank you for your feedback.
Grossart, Hans-Peter	Summary for policymakers	29	29	816	836	#27, I question how effective monitoring strategies are as they may miss important but often unseen organisms when not using molecular tools?	Thank you, monitoring is now further addressed in the summary for policymakers (especially section C)
Lang, Iris	Summary for policymakers	29	29	816	836	The approach presented in this paragraph is very top-down while our experience as a subnational government (at the scale of a French region) is that a bottom-up approach would make more sense. National strategies are too general and they are not so helpful in guiding the needs of local governments to address IAS. If local scales can instead input with their lists of IAS, their successful management measures and their needs to national strategies, those will be more responsive and more easily implemented on the ground.	Thank you, stakeholder engagement and other bottom-up strategies are addressed in other paragraphs
Government of France	Summary for policymakers	29	29	821	821	Please revise the parenthesis since "indigenous, community" are not "sectors" (while this is debatable for industries which can also operate in different sectors). If you discuss different types of stakeholders, please specify "indigenous peoples and local communities".	Thank you, this has been addressed accordingly in the second order draft of the SPM
Kamigawara, Kenji	Summary for policymakers	29	29	821	821	The words, 'shared responsibility' should be changed to 'shared but differentiated responsibility', because without clear definition of responsibility the governance system does not work.	Thank you, we have considered your comment and have made a minor change.
Government of France	Summary for policymakers	29	29	822	827	This sentence is a bit complex. Could it be split in two? The point about guidelines, goals and targets is not clear: do you mean that national reporting supports the design of such guidelines, goals and targets? Or that it is supposed to assess progress towards those? A figure to illustrate how interactions and feedback loop operate across the different scales could be helpful.	Thank you, we have revised this sentence accordingly in the second order draft of the SPM
Government of Canada (Chakravarty, Bipasha)	Summary for policymakers	29	29	831	833	The uncertainty in recognizing and labelling invasive species until they cause harm or become established can affect future surveillance response and modelling strategies (as mentioned in Table SPM.1 in pg14).	Thank you, authors agree with the reviewer
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	29	29	834	834	Line-of-sight is particularly important for these examples.	Thank you, this has been deleted from the second order draft of the SPM and the comment is no longer relevant

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of France	Summary for policymakers	29	29	834	836	This sentence is quite broad and not very informative. It would be better to explicit what lies behind, that could be understood as promoting experience sharing, through easily and publicly accessible tools. This is covered a bit under lines 889-892 which are clearer.	Thank you, this sentence has been deleted in the revised version and this comment no longer applies
Hudin, Stéphanie	Summary for policymakers	29	29	834	836	This sentence is quite broad and not very informative. It would be better to explicit what lies behind, that could be understood as promoting experience sharing, through easily and publicly accessible tools. This is covered a bit under lines 889-892 which are clearer.	Thank you, the section has been substantially edited, and the comment is no longer relevant
Government of Canada (Fraleigh, Brad)	Summary for policymakers	29	30	838	866	Background para 28 does not appear to be connected to any of the Key Messages In Section D. So what is it background to?	Thank you, this has been corrected in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	29	29	838	856	Another hard to follow paragraph. The sentence starting on line 840 is hard to follow. Are there words missing before alignment and coordination? Poor for example or inadequate?	Thank you, this has been revised in the second order draft of the SPM
Kubo, Hideyuki	Summary for policymakers	29	30	838	849	The discussion is quite vague. It deals with interlinkages among trading regions; bordering countries; international and regional agreements; and sectoral policies such as transport, trade, agriculture, aquaculture, silviculture, health, and biodiversity. Then, the need of enhancing coherences of these interlinkages is emphasized. Yes, it is correct. But the discussion is too broad and vague. I think it's better to focus only on legal and regulatory interlinkages or consistency in this paragraph.	Thank you, we have revised this paragraph accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	29	29	840	844	There is something wrong with this sentence, it seems to say that collaboration between regions and coordination across sectors are causes of the failure. Maybe rephrase "Weak coordination and lack of collaboration..."	Thank you, we have revised this paragraph accordingly in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	29	29	844	849	This is a long sentence. At 848 'and aim at improving' seems odd?	Thank you, this has been corrected in the second order draft of the SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	29	30	844	849	Another incredibly long sentence which I have read several times over without being able to make any sense out of it. I think better to say "route" rather than "pathway" as the word "pathway" is used in a technical sense elsewhere in the report, but this change alone is insufficient to bring sense to the sentence: "The interconnections between transport, trade, agriculture/aquaculture/silviculture, health, and biodiversity sectors provide a pathway for effective coordination and the collaborative management of invasive alien species (well established) {6.3.1.1} by placing attention on the relationships between the actors, institutions and policy instruments to identify efficiencies and trade-offs and aim at improving policy coverage and effectiveness (established but incomplete) {6.3.1.1, 6.3.1.3}"	Thank you, this has been corrected in the second order draft of the SPM
Setsaas, Trine Hay	Summary for policymakers	29	30	844	849	Should be moved up, same rationale as comment above.	Thank you, this section has been restructured, and it now addresses the reviewer's concerns in the second order draft of the SPM
Furukawa, Takuya	Summary for policymakers	30	30	849	853	"One Health" does not include plant health, so I think this statement and Figure SPM.6 should not be described as direct adoption of the concept. Also, One Health does not directly target invasive alien species, so it should not be used as an example of integrated IAS management. It might be an example of integrated policy approach that IAS management should learn from, but I think the concept is still under development and there are also competing concepts like "EcoHealth" and "Planetary Health".	Thank you, we have revised the figure and text accordingly in the second order draft of the SPM
Furukawa, Takuya	Summary for policymakers	30	30	849	853	Same comment as above (p.8 L229). Is "One Biosecurity" a widely accepted concept in academic literature or policy arena, or just an emerging concept that requires further discussion and testing? I ran a literature search on WoS, but the number of articles, the diversity of authors, and citations suggest the latter, and I'm not sure if it should be highlighted here along with One Health.	Thank you, we have revised the text in the second order draft of the SPM, but believe this approach needs to be cited as an example. A definition has been included in the glossary.
Government of Argentina	Summary for policymakers	30	30	849	850	What is the "one biosecurity approach"? As far as we know, the one health approach has undergone a process of definition within the WHO, FAO, CBD, etc. If no multilaterally agreed definition exists for this approach, we suggest to delete it, given that positioned together with the One Health approach seems misleading.	Thank you, we have revised the text but believe this approach needs to be cited as an example. A definition has been included in the glossary of the second order draft.
Government of France	Summary for policymakers	30	30	849	853	Approaching the issue of IAS through the concepts of One Health and One Biosecurity is the most innovative option identified in the summary for policymakers and seems to have a true potential to trigger multi-sector action. While most of section D stresses out existing measures which have encountered very limited success so far, this key message is quite central and could be put better under the spotlights in the document.	Thank you, integrated governance (last paragraph) is indeed a key message, but One Health and One Biosecurity are only examples
Sathyapala, Shiroma	Summary for policymakers	30	30	849	857	suggest to include a brief about the One health concept by The Food and Agriculture Organization of the United Nations (FAO), the World Organisation for Animal Health (OIE), the United Nations Environment Programme (UNEP) and the World Health Organization (WHO) . One Health is broad as it extends from human, animal-domestic and wildlife-and environmental health and the activitis are also on invasive alien species .https://www.fao.org/one-health/en	Thank you, these definitions have been added to the Glossary in the second order draft of the SPM
Soubeyran, Yohann	Summary for policymakers	30	30	849	853	Approaching the issue of IAS through the concepts of One Health and One Biosecurity is the most innovative option identified in the summary for policymakers and seems to have a true potential to trigger multi-sector action. While most of section D stresses out existing measures which have encountered very limited success so far, this key message is quite central and could be put better under the spotlights in the document.	Thank you, integrated governance (last paragraph) is indeed a key message, but One Health and One Biosecurity are only examples
Curd, Amélia	Summary for policymakers	30	30	853	855	Before promoting a stronger collaboration amongst existing agreements, a first critical step is to give the proper means for existing agreements to be implemented. This is not clearly stated in the preceding paragraphs.	Thank you, this has been revised, accordingly in the second order draft of the SPM
Curd, Amélia	Summary for policymakers	30	30	853	855	Such positive, action-oriented messages could be better highlighted in the summary for policymakers which seems otherwise quite pessimistic about the problems caused by IAS and the options available to decision-makers.	Thank you, we have revised the entire SPM to be more optimistic and solution-oriented
Government of France	Summary for policymakers	30	30	853	855	Before promoting a stronger collaboration amongst existing agreements, a first critical step is to give the proper means for existing agreements to be implemented. This is not clearly stated in the preceding paragraphs.	Thank you, this is now stated in the first paragraph of section D of the second order draft of the SPM
Government of France	Summary for policymakers	30	30	853	855	Such positive, action-oriented messages could be better highlighted in the summary for policymakers which seems otherwise quite pessimistic about the problems caused by IAS and the options available to decision-makers.	Thank you, we have revised the entire SPM to be more optimistic and solution-oriented
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	30	30	853	855	'stronger collaboration amongst existing multinational agreements.....' This is a key point that needs to be made in the Key Messages.	Thank you, this has been addressed accordingly in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	30	30	854	854	is also part of the coordination options? Maybe just 'is required to close the many gaps'	Thank you, this has been addressed in the second order draft of the SPM
Fagot, Cédric	Summary for policymakers	30	30	857	857	Figure SPM6 Pictogram of Contaminants transfer could be improved	Thank you, done
Furukawa, Takuya	Summary for policymakers	30	31	857	867	Figure SPM.6 looks appealing, but you might want to reconsider how you present it in the main text. See comments above.	Thank you, the figure has been significantly revised, accordingly in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of France	Summary for policymakers	30	30	857	857	Figure SPM6 Pictogram of Contaminants transfer could be improved.	Thank you, done
Government of UK (Sarah Webster, Defra)	Summary for policymakers	30	30	857	858	Figure SPM6 - Super infographic, thank you	Thank you for your feedback.
Peterson, Garry	Summary for policymakers	30	30	857	859	Figure SPM.6: Really nice figure!	Thank you for your feedback.
Dommanget, Fanny	Summary for policymakers	30	30	858	859	Figure SPM.6: Weeds can also impact human health (see e.g. ambrosia ; https://www.sciencedirect.com/science/article/pii/S1470160X19310167?via%3Dihub).	Thank you. Yes, although there are few examples for specific contexts and species, management actions post-establishment of marine invasive alien species is largely ineffective. Please see also chapter 5 section 5.5 for evidence and examples.
Government of Chile (Ministry of the Environment)	Summary for policymakers	30	30	858	858	Figure SPM. 6:The word "consequences" do not reflect what images tries to show, it's confusing. We suggest switch the word for other that help to understand.	Thank you, this has been addressed accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	30	30	858	859	Figure SPM 6: Weeds can also impact human health (see e.g. ambrosia ; https://www.sciencedirect.com/science/article/pii/S1470160X19310167?via%3Dihub).	Thank you, the figure has been significantly revised in the second order draft of the SPM
Government of France	Summary for policymakers	30	31	858	866	Figure SPM 6: In order to better understand why the circles are rather related to human or ecosystem or plant & animal health, the legend could specify how the colors were attributed: are they reflecting on the intensity, the frequency or the distribution of the impacts?	Thank you, the figure has been significantly revised in the second order draft of the SPM
Government of France	Summary for policymakers	30	30	858	859	Figure SPM 6: The circles "predators" and "animal diseases and predators" could be merged and sharing the yellow and green colors. Moreover, predators also have an impact on animal/plant health and not only on the ecosystem...	Thank you, the figure has been significantly revised in the second order draft of the SPM
Government of France	Summary for policymakers	30	30	858	859	Figure SPM.6: how do "habitat transformers" relate to human health? It would seem more obvious on "ecosystem health" and "plant & animal health". Does this relate to nature's contributions to people which impact human health and are modified because of habitat transformers? More generally, a definition of "habitat transformers" is lacking.	Thank you, this has been modified and the comment is no longer relevant
Government of Germany	Summary for policymakers	30	30	858	858	Figure SPM 6: The figure does not yet show what it is supposed to show according to its caption. So far, it only shows the interrelation between ecosystem, plant and animal and human health (One Health) approach. It shows how, e.g. plant pests, predators, etc. impact on these different health systems, but not, what IAS have to do with it (Do they, for example, increase the risk for these health impacts?) Understanding the impacts of/relationship with IAS issues is actually a prerequisite to presenting and discussing management and governance options. Therefore, we strongly recommend to improve this appealing and promising figure by considering for instance the following aspects: - Please clarify the role IAS play: where are they interrelated with the different health components and the round elements? - The categories, which are depicted by the symbols and arranged in a circle need to be clarified- are these functions? Such categories need to be clear and need to be inclusive- e.g. of all ecosystems (in marine, terrestrial and freshwater systems). Please check and add accordingly. - Are the categories of the symbols used in the circle inclusive- e.g. of all ecosystems? Please check and add if needed. - The symbol for "Contaminants transfer" is unclear- please choose a more comprehensive symbol. - Specifically, we suggest to add following aspects: If "predators" is listed as consequence for "ecosystem health" we would also consider "interspecific competition" and "hybridization" as an interspecific consequence of IAS. Furthermore, please consider the ipbes conceptual framework- in particular concepts of nature, nature's contributions to people and a good quality of life - and - if possible- show their linkages to the OneHealth Concept in a comprehensive way. Consequences of biological invasions should actually be presented much earlier in the SPM. We suggest to check whether this figure could be moved up, e.g. to page 10, para 4. (l. 290ff).	Thank you, this figure has been moved, it now conveys a different message and is now in line with the IPBES conceptual framework
Karayannis, Theofanis	Summary for policymakers	30	30	858	859	Figure SPM.6 shows consequences of biological invasions only on health and nature, whereas (as discussed above in row 7) there are also other impacts. Therefore, perhaps some extra wording (e.g. such as "on human, animal, plant and environmental health") should be added to the end of the caption of this Figure, to make it clear that it doesn't cover the entirety of consequences of bioinvasions.	Thank you, the figure has been significantly revised in the second order draft of the SPM
Lang, Iris	Summary for policymakers	30	30	858	859	Figure SPM.6: how do "habitat transformers" relate to human health? It would seem more obvious on "ecosystem health" and "plant & animal health". Does this relate to nature's contributions to people which impact human health and are modified because of habitat transformers? More generally, a definition of "habitat transformers" is lacking.	Thank you, this has been modified and the comment is no longer relevant
Massé, Cécile	Summary for policymakers	30	30	858	859	Figure SPM.6: The circles "predators" and "animal diseases and predators" could be merged and sharing the yellow and green colors. Moreover, predators also have an impact on animal/plant health and not only on the ecosystem...	Thank you, the figure has been updated in the second order draft of the SPM
Participants of ILK dialogue workshop (Guadalupe Yesenia Hernández Márquez)	Summary for policymakers	30	30	858	858	Fig. SPM 6. In which part is included the impacts on genetic diversity, changes in the ecosystem structure and composition, and on the cultural patrimony?	Thank you, this has been modified and the comment is no longer relevant
Pellens, Roseli	Summary for policymakers	30	31	858	866	Figure SPM.6: In order to better understand why the circles are rather related to human or ecosystem or plant & animal health, the legend could specify how the colors were attributed: are they reflecting on the intensity, the frequency or the distribution of the impacts?	Thank you, the figure has been significantly revised in the second order draft of the SPM
Stiger-Pouvreau, Valérie	Summary for policymakers	30	30	858	859	Figure SPM.6: The circles "predators" and "animal diseases and predators" could be merged and sharing the yellow and green colors. Moreover, predators also have an impact on animal/plant health and not only on the ecosystem...	Thank you, the figure has been updated in the second order draft
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	30	30	861	862	Figure SPM 6: the need for research is not visible in this diagram - suggest removal of these two lines	Thank you. As explained in the figure legend, examples supporting the content of diagram are given in Chapter 5.

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of USA	Summary for policymakers	31	31	760	775	The text currently reads as though progress towards Aichi targets is ongoing. The period for Aichi targets ended in 2020. A note should be added in this paragraph to make clear that the Aichi biodiversity targets were for 2011-2020, and the GBF will be negotiated in the near future.	Thank you, this has been clarified in the second order draft of the SPM
Government of USA	Summary for policymakers	31	31	798	798	Same comment as above, a note should be added that the Aichi biodiversity targets were for 2011-2020 and the GBF will be negotiated in the near future	Thank you, the GBF can only be integrated if published before the approval of this assessment
Government of France	Summary for policymakers	31	31	862	862	Figure SPM 6: We suggest to replace "positive feedback loops" by "reinforcing feedback loops" to avoid confusion: those interactions do not lead to positive outcomes.	Thank you, this has been modified and the comment is no longer relevant
Government of France	Summary for policymakers	31	31	863	865	Figure SPM.6: "Addressing biological invasions [...] areas of expertise/discipline." This sentence should be the title of the figure because it allows to read it from a governance perspective. Otherwise, the readers focus on the information from an ecological perspective (which impacts of IAS on different components) and the point on policy integration, though major, is overlooked.	Thank you, we have revised this figure and associated caption in the second order draft of the SPM
Pellens, Roseli	Summary for policymakers	31	31	863	865	Figure SPM.6: "Addressing biological invasions [...] areas of expertise/discipline." This sentence should be the title of the figure because it allows to read it from a governance perspective. Otherwise, the readers focus on the information from an ecological perspective (which impacts of IAS on different components) and the point on policy integration, though major, is overlooked.	Thank you, we have revised this figure and associated caption in the second order draft of the SPM
Atchison, Jennifer	Summary for policymakers	31	31	868	883	Suggested word change to encourage deliberation of social justice concerns - Such a strategy should take into account the asymmetries and differences in policy development among stakeholders	Thank you but the assessment may not be policy prescriptive
Government of Australia	Summary for policymakers	31	31	868	883	Exploration of other incentive structures Comment: There is also opportunity to explore synergies with non-biosecurity related incentives to bring about desired behaviours. For example, biofouling management can be "sold" as a way to increase vessel fuel efficiency. eDNA technologies could at little additional cost deliver data about both invasive species and biodiversity. Players, such as port authorities, might be more willing to contribute to AIS monitoring if they also receive data about the biodiversity in ports that can assist them with demonstrating good environmental stewardship to environmental authorities and community stakeholders. An example is the State-Wide Array Surveillance Program in Western Australia	Thank you, we have added other incentives structures to the second order draft of the SPM
Government of France	Summary for policymakers	31	31	868	868	Please explain what "Command and control government" is. This is not as self-explanatory as e.g. market-based instruments and we could not find a definition in the glossary.	Thank you, this term has been deleted from the second order draft of the SPM for better clarity
Government of Ireland (Nelson, Brian)	Summary for policymakers	31	31	868	883	Also hard to follow. Some of the terms could be added to the glossary like Command and control government. In the last sentence, 'can strengthen specifying equitable' does not make sense.	Thank you, we have removed this term and also strengthen the glossary of the second order draft of the SPM
Government of UK (Mortimer, Diana)	Summary for policymakers	31	31	868	868	Economic incentives do not rely on there being 'command and control' governments. This sentence could just start with 'Governments'.	Thank you, we have edited the sentence for clarification in the second order draft of the SPM
Government of USA	Summary for policymakers	31	31	868	868	What is "command and control government"?	Thank you, this term has been deleted for better clarity
Kubo, Hideyuki	Summary for policymakers	31	31	868	883	This paragraph begins with "Command and control government and market-based instruments can..." but it does not discuss about market-based instruments. Redistribution of public money collected through tariffs, cost-sharing, and penalty systems is not market-based instruments but government incentives. It's better to articulate that the government has a role to provide incentives to concerned stakeholders (i.e. not referring to the concept of "market-based instruments").	Thank you, we have revised the paragraph accordingly in the second order draft of the SPM
Government of Argentina	Summary for policymakers	31	31	869	883	We request to clarify that all market based instruments and trade arrangements should be designed in line with WTO agreements.	Thank you, this is addressed in the chapters in the second order draft of the SPM
Government of France	Summary for policymakers	31	31	873	876	"may take into account": even though the assessment should not be policy prescriptive, the use of "may" here is too ambiguous. Do you just note that it may happen? But is it helpful for decision-makers to take those trade-offs into account? Does this make the policies less ambitious? Does this allow better results through a greater buy-in by stakeholders?	Thank you, we have revised the paragraph accordingly in the second order draft of the SPM
Government of Australia	Summary for policymakers	31	31	876	883	A little more context would help with understanding the concept of "Willingness to pay...". It's not clear how such a concept could be quantified and used in the development of national priorities and regulations. Also the last sentence of this section does not make sense, suggest change '...specifying...' to '...the specification of...'	Thank you, in the second order draft of the SPM, this term has been added to the glossary for clarification
Government of France	Summary for policymakers	31	31	876	877	"Willingness to pay": what does that mean? We could not find a definition in the glossary. Please explain how this approach as an economic tool works.	Thank you, in the second order draft of the SPM, we have added a definition in the glossary.
Government of UK (Mortimer, Diana)	Summary for policymakers	31	31	876	883	This whole section seems to use 'willingness to pay' in a rather strange way. It is usually used as a tool to find out if people are theoretically willing to pay eg through taxes for something. Need to re think what you are trying to say here.	Thank you, we have revised the paragraph accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	31	31	880	883	This sentence seems quite important though it is written in a very technical way. It is difficult to see how this can be operated by decision-makers.	Thank you, we have revised the paragraph accordingly in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	31	31	881	881	strengthen specifying equitable? Delete specifying?	Thank you, we have revised the paragraph accordingly in the second order draft of the SPM
Government of Argentina	Summary for policymakers	31	31	885	888	We suggest to modify this paragraph. Impacts of IAS are not global in nature, are local. They should be addressed locally or through bi-national regional initiatives.	Thank you, this has been revised in the second order draft of the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	31	31	885	889	This sentence is sufficiently complex that I do not understand it.	Thank you, we have revised the paragraph accordingly in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	31	31	885	916	Paragraph 30 is really hard to follow, far too jargon heavy language	Thank you, we have revised the paragraph accordingly in the second order draft of the SPM
Government of Mexico (Koleff, Patricia)	Summary for policymakers	31	31	885	889	IAS are part of global change, but impacts are local. Option: 30. Addressing local impacts of invasive alien species in the context of.....	Thank you, this has been revised in the second order draft of the SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	31	31	885	903	Both the emboldened title of (30) and text within it (the sentence starting "Multidisciplinary approaches....") are completely opaque in meaning to me. I strongly doubt whether anyone knows what "long-term investment in multidisciplinary systems-based approaches and effective and adaptive management and governance systems operating across multiple levels of engagement (global to local) through international institutions" looks like or means. If it does have a meaning, then this needs to be put much more simply.	Thank you, we have revised the paragraph accordingly in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Kubo, Hideyuki	Summary for policymakers	31	32	885	916	This paragraph talks about the global perspective and overarching governance issues so that it is better to put at the beginning of the Section D.	Thank you, we have revised the structure in the second order draft of the SPM accordingly
Collas, Marc	Summary for policymakers	31	31	889	892	The funding gap should be made more explicit here for those measures to be successful. Even if the detection systems are in place, there is generally a lack of human and financial resources available to carry out a rapid response. As an example, one local government in France put aside 5 000€ in its annual budget to address IAS, while one eradication operation at the scale of a city is estimated around 60 000€. If the funds need to be raised through grants or subventions, this takes a lot more time and the intervention is likely to be less successful.	Thank you, we have revised the paragraph accordingly in the second order draft of the SPM
Collas, Marc	Summary for policymakers	31	31	889	892	We agree with the authors that real-time information, early detection and rapid response are the most effective measures to address the risk of IAS. This could be better underlined, and should be completed by a mention of the necessity of ecological monitoring, on which those effective responses rely.	Thank you, we have revised section C accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	31	31	889	892	It would be helpful to have an estimated cost for these actions and therefore, the width of the required investment.	Thank you, a table has been added in response to this comment in the second order draft of the SPM
Government of France	Summary for policymakers	31	31	889	892	The funding gap should be made more explicit here for those measures to be successful. Even if the detection systems are in place, there is generally a lack of human and financial resources available to carry out a rapid response. As an example, one local government in France put aside 5 000€ in its annual budget to address IAS, while one eradication operation at the scale of a city is estimated around 60 000€. If the funds need to be raised through grants or subventions, this takes a lot more time and the intervention is likely to be less successful.	Thank you, we have revised the paragraph accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	31	31	889	892	We agree with the authors that real-time information, early detection and rapid response are the most effective measures to address the risk of IAS. This could be better underlined, and should be completed by a mention of the necessity of ecological monitoring, on which those effective responses rely.	Thank you, we have revised section C accordingly in the second order draft of the SPM
Hudin, Stéphanie	Summary for policymakers	31	31	889	892	The funding gap should be made more explicit here for those measures to be successful. Even if the detection systems are in place, there is generally a lack of human and financial resources available to carry out a rapid response. As an example, one local government in France put aside 5 000€ in its annual budget to address IAS, while one eradication operation at the scale of a city is estimated around 60 000€. If the funds need to be raised through grants or subventions, this takes a lot more time and the intervention is likely to be less successful.	Thank you, we have revised the paragraph accordingly in the second order draft of the SPM
Lang, Iris	Summary for policymakers	31	31	889	892	We agree with the authors that real-time information, early detection and rapid response are the most effective measures to address the risk of IAS. This could be better underlined, and should be completed by a mention of the necessity of ecological monitoring, on which those effective responses rely.	Thank you, we have revised section C accordingly in the second order draft of the SPM
Government of France	Summary for policymakers	31	31	891	891	"Prevention and preparedness systems": this is not clear for non-expert readers what these "systems" really are. Labs, satellites, Government departments...?	Thank you this has been simplified in the second order draft of the SPM
Government of France	Summary for policymakers	31	31	892	892	Speaking of "established species" here does not seem appropriate since the measures described aim at avoiding the establishment of the IAS. Maybe rather use "emerging species" instead.	Thank you, we have revised the paragraph accordingly in the second order draft of the SPM
Lang, Iris	Summary for policymakers	31	31	892	892	Speaking of "established species" here does not seem appropriate since the measures described aim at avoiding the establishment of the IAS. Maybe rather use "emerging species" instead.	Thank you, we have revised the paragraph accordingly in the second order draft of the SPM
Collas, Marc	Summary for policymakers	31	31	893	897	Even though climate change will more and more impact the spread of IAS and the management responses available, as of today we have no guidance or tools available in order to adapt management practices.	Thank you, this has been raised in the table on knowledge gaps
Government of France	Summary for policymakers	31	31	893	897	Even though climate change will more and more impact the spread of IAS and the management responses available, as of today we have no guidance or tools available in order to adapt management practices.	Thank you, this has been raised in the table on knowledge gaps
Government of Germany	Summary for policymakers	31	31	893	895	Proposal: This seems to be too speculative. Climate change will have a strong impact of the geographical distribution of native species enlarging their habitats. Please consider deletion of this sentence.	Thank you, the sentence has been deleted from the second order draft of the SPM following this comment
Government of Mexico (Koleff, Patricia)	Summary for policymakers	31	31	893	895	The idea is not clear, what means "Global tackling", and to build invaded ecosystems climate change resilience, restoration actions are usually needed	Thank you, the sentence has been deleted for better clarity in the second order draft of the SPM
Government of USA	Summary for policymakers	31	31	893	895	Not quite sure what this sentence means - Adaptive management can help tackle IAS under climate change, and removing invasive species can also help build ecosystem resilience to climate change?	Thank you, the sentence has been deleted from the second order draft of the SPM, following this comment
Government of France	Summary for policymakers	31	31	894	894	It is not clear here what is successful: if the management is successful, then the ecosystem is not invaded anymore and sentence should read "help build climate change resilience of the restored ecosystem". Otherwise, you mean here "unsuccessful": then when the ecosystem is invaded at least one could try and increase its resilience to climate change.	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Germany	Summary for policymakers	31	31	895	897	Proposal: This sentence seems too speculative, please consider its deletion.	Thank you, this has been reworded in the second order draft of the SPM for clarification
Government of France	Summary for policymakers	31	31	898	898	Delete "change" in "multiple change drivers". By definition, a driver is making a change.	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of France	Summary for policymakers	31	31	899	900	Add "while": "address the complexities of global environmental change while respecting broad societal values..."	Thank you, this sentence has been deleted and the comment is no longer relevant
Government of Finland (Niemi-Lahhti, Johanna)	Summary for policymakers	31	32	904	909	see above	Thank you, we have added more details on the mechanisms in the second order draft of the SPM
Government of Switzerland	Summary for policymakers	31	32	904	911	Here again we recommend to list first the International Agreements and then the organisations? We would also add the SPS to the list of International Agreements (see comments above)	Thank you, this list of examples has been deleted and the comment is no longer relevant
Government of France	Summary for policymakers	31	31	915	915	"Interactive": do you mean "interacting"?	Thank you, this has been corrected in the second order draft of the SPM
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	32	32	911	913	Global capacity building and.....' A key point that needs to be made in the Key Messages.	Thank you, this is included in Key message D4

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Atchison, Jennifer	Summary for policymakers	32	32	918	936	Any and all references to Indigenous knowledge, including Indigenous traditional knowledge, should note, make reference to, and align with relevant articles on Indigenous knowledge and intellectual property contained within the UN declaration on the Rights of indigenous peoples, 2007. Indigenous peoples must be able to benefit from the use of their knowledge about invasive species as well as have consent and control over the collection, collation and dissemination of that knowledge.	Thank you, please refer to chapter 1 to learn more about our methodology
Government of Canada (Fraleigh, Brad)	Summary for policymakers	32	32	918	936	ILPC issues are more specifically treated in Sections A and C. There does not seem to be any connection to any of the Key Messages in Section D.	Thank you, we have improved this in the second order draft of the SPM
Government of Germany	Summary for policymakers	32	32	918	920	Proposal: Please expand a bit further on the traditional knowledge that can be used to manage invasive alien species- for instance by giving few examples.	Thank you, examples can be found in the chapters but this is now more explicit in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	32	32	918	936	"invaluable traditional knowledge that can be used" but it does not specify for what?	Thank you we have edited this sentence accordingly in the second order draft of the SPM
Kubo, Hideyuki	Summary for policymakers	32	32	918	920	This paragraph is contradictory in a sense that it says ILK is invaluable against IAS on the one hand, it argues the support is required for indigenous and local communities to address IAS issues on the other. It is better to frame more clearly as to how the ILK is useful and why not sufficient (so that the support is required when invasion of IAS cannot be stopped).	Thank you, we have revised this paragraph in the second order draft of the SPM
Government of Australia	Summary for policymakers	32	32	919	919	Replace "traditional knowledge" with "traditional and local knowledge"	Thank you, in the second order draft of the SPM, we have replaced it by knowledge systems
Government of Australia	Summary for policymakers	32	32	920	920	Replace "political authority" with "political authority and opportunity to engage meaningful with authorities and experts"	Thank you, we have revised this paragraph accordingly in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	32	32	925	925	to be fully engaged? Delete?	Thank you, we have deleted this part accordingly from the second order draft of the SPM
Evans, Thomas	Summary for policymakers	32	32	932	933	borad... and broader...	Thank you, this has been addressed in the second order draft of the SPM
Government of France	Summary for policymakers	32	32	932	933	Something seems missing. "If stakeholder views are not taken into account, this may lead to less desirable..."	Thank you, this has been corrected in the second order draft of the SPM
Government of USA	Summary for policymakers	32	32	932	932	What does "this" refer to here? effective governance? although wouldn't that lead to more desirable outcomes?	Thank you, this has been corrected in the second order draft of the SPM
Government of France	Summary for policymakers	32	32	933	935	"Effective and appropriate active adaptive governance...": this sentence is wordy. It may be improved by avoiding technical terms and illustrating the point with an example, like a setting where this governance was arranged and turned out to be effective.	Thank you, this has been corrected in the second order draft of the SPM
Atchison, Jennifer	Summary for policymakers	32	33	938	965	Information systems must acknowledge and accommodate sensitive data including Indigenous knowledge pertaining to invasive species and their management. Any and all data collection, synthesis, initiative, protocols, systems or platforms must protect Indigenous knowledge and intellectual property. Data standardization and open access forms are likely not the best form of data storage and protection for Indigenous knowledge.	Thank you, free prior and informed consent is indeed included in the SPM
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	32	33	938	965	Lines of sight to entire chapters are too broad to be useful, here and elsewhere. Important elements that draw from multiple lines of evidence should be covered in the chapter summary, which should in turn have its own lines of sight. Knowledge-sharing can improve but it cannot ensure (line 949) knowledge availability, given existing gaps ("ignorance" in the helpful Fig 6.19)	Thank you, this has been corrected in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	32	33	938	965	there are two uses of invasive alien species in the overarching sentence. The second could be deleted without affecting meaning.	Thank you, this has been corrected in the second order draft of the SPM
Government of Mexico	Summary for policymakers	32	33	938	965	Paragraph could be summarized.	Thank you, the section has been substantially edited, and the comment is no longer relevant
Grossart, Hans-Peter	Summary for policymakers	32	33	938	965	#32, I suggest to explicitly add the term citizen science as I see it as an effective tool, e.g. for monitoring, but also for certain measures to counteract invasive alien species.	Thank you, citizen science has been added to section c - as a management tool
Kubo, Hideyuki	Summary for policymakers	32	33	938	965	Not sure to what extent the IAS information system can be used in the world. I assume it's not pragmatic for many developing countries. It's better to depict the current reality of usage for public awareness and draw a process of application and expansion.	Thank you, both are mentioned
Nunes, Ana	Summary for policymakers	32	33	938	965	Current global information systems that provide valuable information could be mentioned here, such as CABI ISC, GRIIS and GISD. The request for more funds to support and improve these systems could also be mentioned.	Thank you, this comment has been partly addressed. Examples can be found in the chapter
Government of Germany	Summary for policymakers	32	32	941	950	Proposal: You may wish to refer to The Global Invasive Species Database (www.iucngisd.org) or the Global Register of Introduced and Invasive Alien Species (www.griis.org) directly in the text, for instance as follows: F.e....."Integrated invasive alien species information systems like the Global Invasive Species Database (www.iucngisd.org) and the Global Register of Introduced and Invasive Alien Species (www.griis.org), avoid duplication....."	Thank you, this example is mentioned in the chapter in the second order draft of the SPM
Government of UK (Sarah Webster, Defra)	Summary for policymakers	32	33	943	959	Needs to be clear what benefits a global information system on IAS could provide and associated costs.	Thank you, we have edited the text accordingly in the second order draft of the SPM
Government of Canada (Alexander, Steven)	Summary for policymakers	32	32	946	946	It is so fabulous to see the reference to CARE principles referenced and noted here. This will not be familiar to many so I would suggest a key detail to include in the sentence is that the CARE principles are in support of Indigenous data sovereignty.	Thank you, we have unfortunately deleted this from the second order draft of the SPM as it was too detailed, but this is well covered in the chapter
Brooks, Thomas	Summary for policymakers	32	32	950	950	Important to add a sentence here about core IAS related databases. Something like "Particularly key resources include the Environmental Impact Classification of Alien Taxa, the Global Invasive Species Database, the Global Register of Introduced and Invasive Species, and the documentation of threats from invasive alien species in the IUCN Red List of Threatened Species."	Thank you, this example is mentioned in the chapter
Government of UK (Mortimer, Diana)	Summary for policymakers	33	33	963	963	is essential' should avoid prescriptive language	Thank you, we have deleted this policy-prescriptive word from the second order draft of the SPM
Government of Australia	Summary for policymakers	33	33	967	967	Replace "Public awareness" with "Public engagement"	Thank you, engagement has been added, but authors believe it cannot replace awareness

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	33	33	967	968	This is not supported by 6.4.3, which provides examples of collaboration with Indigenous people and local communities but does not discuss conditions for success. 6.5.4 on global supply chains does not discuss public awareness except as an outcome of certification and as necessary support for new funding mechanisms - the latter with no citation. 6.6.2 includes 6.6.2.1 on citizen science, reflecting the potential value of public input but not supporting public awareness as key to IAS management.	Thank you, we have corrected this in the revised chapter in the second order draft of the SPM
Government of France	Summary for policymakers	33	33	967	968	Also mention citizen science (particularly for detection and surveillance)	Thank you, this has been included in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	33	33	967	987	In this paragrph we consider that use of co- is unnecessary (and in earlier paragraph).Who are the co-designers? Is co-designed needed at all. Similarly with co-created.	Thank you, as demonstrated in Section D, co-management optimizes management success.
Jactel, Hervé	Summary for policymakers	33	33	967	968	Also mention citizen science (particularly for detection and surveillance)	Thank you, this has been included in the second order draft of the SPM
Government of France	Summary for policymakers	33	33	969	969	"through integrative and collaborative engagement, leading to relevant actions" could be deleted without impairing the meaning of the sentence while improving its readability.	Thank you, this change has been included in the second order draft of the SPM
Furukawa, Takuya	Summary for policymakers	33	33	973	976	Please provide confidence levels of these statements.	Thank you, this change has been included in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	33	33	980	980	Viz.?	Thank you, this change has been included in the second order draft of the SPM
Government of France	Summary for policymakers	33	33	984	984	What does "social learning" refer to? We could not find a definition in the glossary.	Thank you. Social learning is when social behaviour is learned by observing and imitating the behaviour of others - this definition is not specific to invasive alien species and authors prefer not to include it.
Evans, Thomas	Summary for policymakers	33	33	986	987	in school and college curriculums	Thank you, this change has been included in the second order draft of the SPM
Government of Germany	Summary for policymakers	33	33	986	987	Proposal: There are so many activities out in the world that might be beneficial for curricula. Please include this recommendation as part of a larger discussion of healthy and resilient social-ecological systems.	Thank you, this has been deleted from the revised version as it would go beyond the scope of our assessment
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	33	34	989	1009	The call for integration is clear here, but it's not clear what actions policy makers could take to achieve what ends. Suggest that this be revised to provide a list concrete options: a couple of examples might be "agreeing to an open-data policy and adopting existing data standards would enable greater information sharing, which in turn would contribute to better risk assessment and management decisions" or "Intergovernmental coordination would reduce gaps in regulation and facilitate decision-making to achieve shared goals."	Thank you, we have revised the second order in the SPM accordingly
Government of Mexico (Koleff, Patricia)	Summary for policymakers	33	35	989	1012	Integrated governance should be referred to SDG goals and One Health	Thank you further details can be found in the chapter
Setsaas, Trine Hay	Summary for policymakers	33	34	989	1009	Possible solutions to address challenges should be easy to find and understood for the reader. Especially so for policy and decision-makers. It is recommended to keep this in mind when reviewing the document.	Thank you, the SPM has been revised to be more solution-oriented
Government of USA	Summary for policymakers	33	33	990	992	What is transformative progress?	Thank you, this has been removed to avoid confusion
Evans, Thomas	Summary for policymakers	33	33	991	991	meet	Thank you, this has been addressed in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	33	33	993	993	as these are known	Thank you, this has been addressed in the second order draft of the SPM
Government of Ireland (Nelson, Brian)	Summary for policymakers	34	34	1001	1001	sectoral rather than sectorial?	Thank you, this has been addressed in the second order draft of the SPM
Government of USA	Summary for policymakers	34	34	1002	1003	Connectivity of what? Data?	Thank you, this has been deleted and the comment is no longer relevant
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	34	34	1003	1005	'3) more robust and coordinated global regulatory instruments.....' and '7) establishment of (multi)national oversight and coordinating bodies and mechanisms.' Key points that need to be mentioned in the Key Messages.	Thank you, this has been added in the second order draft of the SPM
Government of Argentina	Summary for policymakers	34	34	1004	1004	We suggest to delete the reference to multinational global regulatory instruments and just to refer to coordinated regulatory instruments	Thank you, this has been rephrased in the second order draft of the SPM
Government of Germany	Summary for policymakers	34	34	1005	1005	Proposal: The term "shared and differentiated responsibilities between ..." seems very similar to the term "common but differentiated responsibilities" under the UNFCCC Paris Agreement and should be replaced here by different and clearer language that explains what is actually meant by this component in the context of IAS. This would also apply to Figure SPM.7	Thank you, authors have made a minor change but do not think it needs to be consistent with the UNFCCC as this is not the same concept.
Government of Mexico	Summary for policymakers	34	34	1005	1006	Lever 4 leaves out other relevant stakeholders and seems to lay a strong responsibility on IPLCs, rather than take them into account. Suggestes wording: "4) shared and differentiated responsibilities between governments and relevant stakeholders, including indigenous peoples and local communities and industries;"	Thank you. Indigenous peoples and local communities do not identify as stakeholders, and may not be included in this group.
Government of Canada (Gadallah, ZuZu)	Summary for policymakers	34	34	1011	1011	Figure SPM.7This figure does not provide much insight on what integrated governance looks like or how to get there. The small gears (referred to as levers in the text) connect in a chain but do not mesh with the large one. What drives what? How it is that a path suddenly arises from the central gear?	Thank you, the figure has been revised to increase its relevance in the second order draft of the SPM
Evans, Thomas	Summary for policymakers	35	35	1010	1010	Fig. SPM 7. Left green box. 'of IAS on GQL' (replace of with on).	Thank you, the figure has been revised and the comment is no longer relevant
Evans, Thomas	Summary for policymakers	35	35	1010	1010	Fig. SPM 7. Third green box (equitable). Text doesn't make sense?	Thank you, the figure has been revised and the comment is no longer relevant
Government of Canada (Fraleigh, Brad)	Summary for policymakers	35	36	1010	1018	Figure SPM.7 is not very useful because it gives no indication of who does what. Suggest deletion.	Thank you, the figure has been revised to increase its relevance in the second order draft of the SPM

Reviewer Name (Last, First)	Chapter	From Page	To Page	From Line	To Line	Comments	Final response
Government of Chile (Ministry of the Environment)	Summary for policymakers	35	35	1010	1010	Figure SPM. 7: We would suggest adding an extra gear that represent the "access to information" and "sensitization and awareness mechanisms".	Thank you, we have completely revised the figure in the second order draft of the SPM and hopefully address your concerns. Please see the glossary for definitions.
Government of Germany	Summary for policymakers	35	35	1010	1012	Figure SPM.7: Currently, we do not see an added value of this figure, as it merely repeats what is said under para 34.	Thank you, the figure has been revised to increase its relevance in the second order draft of the SPM
Bortolus, Alejandro	Summary for policymakers	35	35	1011	1012	Figure SPM.7.This figure should include an eighth point stating "Funding/financial support", as this is essential to ensure inclusion of all relevant stakeholders, effective management, etc. Many governments and agencies will need to use this Figure, to ask for financial support at the local or regional scale, as well as to integrate multinational efforts.	Thank you, the figure has been revised to increase its relevance in the second order draft of the SPM
Curd, Amélia	Summary for policymakers	35	35	1011	1012	Figure SPM 7: Before promoting a stronger collaboration amongst existing agreements as in Gear 4, a first critical step is to give the proper means for existing agreements to be implemented and enforced (e.g., BMW convention). A key message is required further up in the SPM to highlight the areas of improvement for the implementation of existing tools.	Thank you, we have completely revised the figure in the second order draft of the SPM and hopefully address your concerns. Please see the glossary for definitions.
Curd, Amélia	Summary for policymakers	35	35	1011	1012	Figure SPM 7: The phrasing in Gear 6 is problematic: there are many existing risk assessment tools. Priority is not that much to create new ones but rather to broaden the use of existing ones. If we follow what is suggested in 1) (line 1001), the issue is to upscale tools that are mostly developed at the national level. Gear 6 could thus be rephrased as "Coordinated global risk assessment".	Thank you, we have changed the wording (and revised the figure) and hopefully addressed the reviewer's concerns.
Government of Finland (Niemivuo-Lahti, Johanna)	Summary for policymakers	35	35	1011	1011	Figure SPM 7: Excellent summary for the path towards the transformative change on IAS management.	Thank you for your comment
Government of France	Summary for policymakers	35	35	1011	1012	Figure SPM 7: Before promoting a stronger collaboration amongst existing agreements as in Gear 4, a first critical step is to give the proper means for existing agreements to be implemented and enforced (e.g., BMW convention). A key message is required further up in the SPM to highlight the areas of improvement for the implementation of existing tools.	Thank you, we have completely revised the figure in the second order draft of the SPM and hopefully address your concerns. Please see the glossary for definitions.
Government of France	Summary for policymakers	35	35	1011	1012	Figure SPM 7: The phrasing in Gear 6 is problematic: there are many existing risk assessment tools. Priority is not that much to create new ones but rather to broaden the use of existing ones. If we follow what is suggested in 1) (line 1001), the issue is to upscale tools that are mostly developed at the national level. Gear 6 could thus be rephrased as "Coordinated global risk assessment".	Thank you, we have completely revised the figure in the second order draft of the SPM and hopefully address your concerns. Please see the glossary for definitions.
Government of Norway (Fontaine, Eva Hauge)	Summary for policymakers	35	36	1011	1012	Figure SPM 7: the figure does not read so well, not intuitive. Sounding wheel 2: Should it be "differentiated" instead of "differential" in order to be consistent with term used previously?	Thank you, we have revised the figure to increase its readability and changed the wording accordingly in the second order draft of the SPM
Government of UK (GB Non-native Species Secretariat)	Summary for policymakers	35	35	1011	1011	Figure SPM.7. The infographics in the summary for policy makers are broadly excellent. However, this one is weaker than the others. It is not clear what all of the phrases mean and they stray into jargon 'transnational system connectivity'. This needs to be tightened up. What does 'impact of IAS of good quality of life' mean?	Thank you, we have completely revised the figure in the second order draft of the SPM and hopefully address your concerns. Please see the glossary for definitions.
Massé, Cécile	Summary for policymakers	35	35	1011	1012	Figure SPM 7: The phrasing in Gear 6 is problematic: there are many existing risk assessment tools. Priority is not that much to create new ones but rather to broaden the use of existing ones. If we follow what is suggested in 1) (line 1001), the issue is to upscale tools that are mostly developed at the national level. Gear 6 could thus be rephrased as "Coordinated global risk assessment".	Thank you, we have completely revised the figure in the second order draft of the SPM and hopefully address your concerns. Please see the glossary for definitions.
Evans, Thomas	Summary for policymakers	36	36	1013	1014	Can you word this so you don't need to use the term invasive alien species twice?	Thank you, this has been revised accordingly in the second order draft of the SPM
Government of Chile (Ministry of the Environment)	Summary for policymakers	36	36	1013	1014	Figure SPM. 7: It is not clear about what target is referring. We suggest specifying it.	Thank you, we have completely revised the figure in the second order draft of the SPM and hopefully address your concerns
Government of Germany	Summary for policymakers	36	36	1013	1016	Proposal: It is suggested to engage with the scientific community working on the transformative change assessment, so as to ensure consistency to what is referred to herein.	Thank you, communication between the 2 expert groups is possible but timelines will not allow the IAS assessment to align with the TC assessment (the opposite will however be possible)