CONVENTION SUR LE COMMERCE INTERNATIONAL DES ESPÈCES
DE FAUNE ET DE FLORE SAUVAGES MENACÉES D'EXTINCTION

Vingt-cinquième session du Comité pour les plantes
Genève (Suisse), 17 et 20-23 juillet 2020

Questions spécifiques aux espèces

COMMERCE DES PLANTES MÉDICINALES ET AROMATIQUES

1. Le présent document a été préparé par le Secrétariat.

Contexte

2. À sa 18e session (CoP18, Genève, 2019), la Conférence des Parties a adopté les décisions sur le *Commerce des plantes médicinales et aromatiques* suivantes :

18.300 À l'adresse du Secrétariat

Le Secrétariat :

a) se concerte avec les principaux acteurs de la chaîne de l'offre et de la chaîne de valeur du commerce des plantes médicinales et aromatiques pour les sensibiliser et accroître leur compréhension des règlements CITES pour les espèces de plantes médicinales et aromatiques et des effets du commerce des plantes médicinales et aromatiques sur la conservation des espèces de plantes médicinales et aromatiques CITES dans la nature ;

b) sous réserve des ressources disponibles, analyse les difficultés et possibilités pour la CITES concernant le commerce des plantes médicinales et aromatiques, notamment :

i) fournit une vue d'ensemble actualisée sur le commerce international des espèces de plantes inscrites à la CITES et commercialisées sous forme de produits médicinaux, et évalue si les bases de données existantes contenant les noms commerciaux des espèces de plantes médicinales et aromatiques CITES peuvent être reliées à la base de données sur la Liste des espèces CITES ;

ii) examine les travaux en cours sur la chaîne de l'offre et la chaîne de valeur durables et traçables pour les produits de plantes médicinales et aromatiques, en mettant l'accent sur les programmes, les normes et les lignes directrices en matière de certification ;

iii) examine les études de cas qui tiennent compte des connaissances locales et traditionnelles et des évaluations, du suivi et de la gestion participatifs des espèces de plantes médicinales et aromatiques CITES ; et

iv) sur la base des résultats des sous-paragraphes i) à iii), élabore des recommandations pour, entre autres, compléter les outils existants relatifs à l'application de la Convention pour les plantes médicinales et aromatiques CITES, en créant des synergies, le cas échéant, avec les organisations et acteurs intergouvernementaux compétents ;

c) rend compte au Comité pour les plantes des résultats des travaux décrits dans les paragraphes a) et b).

18.310 À l'adresse des Parties

Les Parties sont invitées à prendre des mesures pour sensibiliser ceux qui font le commerce des espèces de plantes médicinales et aromatiques et leur faire mieux comprendre les règlements CITES pour la conservation de ces espèces.

18.302 À l'adresse du Comité pour les plantes

Le Comité pour les plantes étaie le processus et donne des conseils conformément à la décision 18.300, compte tenu du document CoP18 Inf.11 et d'autres informations pertinentes, et examine le rapport du Secrétariat découlant de la décision 18.300 et fait des recommandations au Comité permanent ou à la Conférence des Parties, le cas échéant.

18.303 À l'adresse du Comité permanent

Le Comité permanent examine tout rapport du Comité pour les plantes au titre de la décision 18.302 et fait des recommandations aux Parties, s'il y a lieu, et à la Conférence des Parties.

Application de la décision 18.300

3. Pour mettre en œuvre l'intégralité de la décision 18.300, il conviendrait de disposer d'un financement externe estimé à 70 000 USD pour commander une étude conformément au paragraphe b) de cette décision, compléter la panoplie d'outils existante conformément à l'alinéa iv) du paragraphe b), et prendre en charge les éventuels frais de déplacement de collaborateurs. Au moment de la rédaction du présent document, ces fonds n'avaient pas encore été obtenus (voir notification n°2020/032) et le Secrétariat poursuivait les efforts nécessaires pour trouver les ressources indispensables à la réalisation de ces activités. Dans l'intervalle, il a entamé des recherches pour faire progresser la mise en œuvre des éléments pertinents de la décision 18.300, comme indiqué plus en détail ci-après.

Décision 18.300, paragraphe a)

4. Conformément au paragraphe a) de la décision 18.300, le Secrétariat s'est employé à sensibiliser les principaux acteurs et à leur faire mieux connaître les règlements CITES s'agissant du commerce d'espèces de plantes médicinales et aromatiques dans le cadre de la mise en œuvre du paragraphe b) de la décision 18.300, comme indiqué plus en détail dans les sections ci-après.

Décision 18.300, paragraphe b) i)

État d'avancement de la vue d'ensemble actualisée sur le commerce international des espèces de plantes inscrites à la CITES et commercialisées sous forme de produits médicinaux ou aromatiques

5. Le commerce d'espèces de plantes médicinales et aromatiques (PMA) inscrites aux annexes CITES a été présenté dans plusieurs documents d'information soumis à de récentes réunions du Comité pour les plantes et de la Conférence des Parties. L'annexe 1 du document d'information PC24 Inf. 12 présente une étude sur le commerce international de 827 espèces de PMA sur la période 2006-2015. Établie à partir des informations figurant dans la base de données sur le commerce CITES, elle indique les quantités et les produits commercialisés, ainsi que les principaux pays importateurs et exportateurs. Selon cette étude, le commerce de plantes médicinales et aromatiques sur cette période a porté au total sur 54 millions de kg, dont 25 millions de kg (soit 47% du total) prélevés dans la nature. En termes de volume, les produits prélevés dans la nature les plus fréquemment commercialisés sont les écorces et les cires. D'après les données enregistrées, le volume des extraits présents dans le commerce serait en hausse. Les copeaux, les poudres, les racines et autres produits sont commercialisés en plus faibles quantités. La plupart des exportations proviennent de l'Afrique du Sud, du Cameroun et du Mexique. Les principaux pays importateurs sont l'Allemagne, l'Espagne, les États-Unis d'Amérique, la France et le Japon. Quarante-trois espèces ont été déclarées, aussi bien par des pays importateurs qu'exportateurs. Il ressort des données transmises par les Parties importatrices que le commerce le plus important concerne des cires d'*Euphorbia antisyphilitica* en provenance du Mexique (10 millions de kg), de l'écorce de *Prunus africana* du Cameroun et de l'Ouganda (8,2 millions de kg), des extraits et de la poudre d'*Aloe ferox* d'Afrique du Sud (2,7 millions de kg), des

copeaux et de la poudre d'*Aquilaria malaccensis* du Bangladesh, d'Indonésie, de la Malaisie et de Singapour (2,2 millions de kg), et des racines de *Cibotium barometz* de Chine, d'Indonésie et du Vietnam (0,6 million de kg). D'après les données communiquées par les exportateurs, des racines et des produits de *Nardostachys grandiflora* du Népal figurent également parmi les espèces donnant lieu aux plus gros volumes d'échanges (0,9 million de kg). À un niveau plus élevé, six espèces d'orchidées du genre Dendrobium présentent un volume commercial combiné de 0,5 million de kg, selon les rapports des importateurs. Des informations similaires qui confirment ces résultats sont également publiées dans une étude revue par des pairs (Timoshyna et al., 2019). Au rang taxonomique supérieur, selon les données d'importation, six espèces d'orchidées du genre *Dendrobium* présentent un volume d'échanges cumulés de 0,5 million de kg. Des informations similaires publiées dans une étude indépendante (Timoshyna et al., 2019) viennent corroborer ces chiffres.

6. Il n'existe aucun code douanier spécifique (dans le cadre du Système harmonisé de désignation et de codification des marchandises (SH), un ensemble de codes normalisés utilisé par les autorités douanières qui permet également d'établir des statistiques relatives au commerce) pour rendre compte du commerce international de PMA, à l'exception de certains codes propres à des taxons particuliers. À compter de 2022 par exemple, au titre du SH, le commerce de produits de *Prunus africana* sera désigné par le code 1211.60 (FAO, 2020). Appliquer ce type de code, ainsi que d'autres codes du SH propres à certaines espèces, à des taxons CITES pourrait faciliter et venir compléter le système de contrôle du commerce.

7. La proportion de PMA dans les saisies signalées de spécimens d'espèces CITES témoigne elle aussi de l'importance du commerce de ces espèces. Citons à titre d'exemple l'analyse de saisies relatives à des espèces CITES signalées par les États membres de l'Union européenne. Entre janvier et décembre 2017, 27% de ces saisies portaient sur des plantes médicinales et des produits d'animaux ainsi que sur des parties et produits destinés à des fins médicinales. Figuraient parmi ces saisies 218 693 produits médicinaux d'origine végétale (auxquels venaient s'ajouter 13,5 kg et 32 litres supplémentaires), dont de nombreux spécimens d'espèces de PMA inscrites à l'Annexe II, par exemple *Aloe arborescens, Gastrodia elata orchid, Hoodia gordonii, Prunus africana* ou *Euphorbia antisyphilitica* (TRAFFIC, 2019). En 2018, 23% de l'ensemble des saisies signalées par des États membres de l'Union européenne concernaient des parties et produits de plantes médicinales ou d'animaux. Figuraient parmi ces saisies 260 562 produits médicinaux d'origine végétale (auxquels venaient s'ajouter 6,685 kg et 32 litres supplémentaires) (TRAFFIC, 2020).

8. Plusieurs études donnent à penser que des espèces de plantes inscrites aux annexes CITES font l'objet d'un commerce électronique important qui n'est pas pris en compte dans la base de données sur le commerce de la CITES. À titre d'exemple, Hinsley et al. (2016) ont recensé sur une période de 12 semaines entre 1100 et 2300 annonces proposant à la vente différentes quantités d'orchidées sauvages, et ce sur un seul réseau social. Sajeva et al. (2013) ont quant à eux entrepris de mettre en regard les transactions réalisées sur une plateforme en ligne par 24 vendeurs d'espèces de cactus inscrites à l'Annexe I avec les données d'exportation enregistrées dans la base de données sur le commerce de la CITES. Cette comparaison a fait apparaître d'importants écarts entre le nombre de plantes ayant fait l'objet de permis d'exportation et le nombre de plantes effectivement vendues en ligne, ce qui laisse entendre que seuls 10% des échanges étaient potentiellement légaux. D'autres exemples sont mentionnés dans le document CoP18 Doc. 55. Le document d'information PC23 Inf. 10 présente les résultats de l'étude du Secrétariat sur les produits de plantes médicinales proposés à la vente sur Amazon et sur eBay contenant (ou prétendant contenir) au moins une espèce sur une liste de 365 espèces de plantes médicinales CITES. Si l'étude ne portait ni sur les sources de ces produits, ni sur les éventuelles dérogations prévues au titre d'annotations, il ressort du document d'information PC23 Inf. 10 qu'une proportion inconnue mais possiblement importante du commerce international en ligne de produits de plantes médicinales CITES pourrait échapper au système de contrôle de la Convention et/ou que certains acteurs pourraient ne pas être au courant des règlements CITES applicables.

9. Une étude de suivi consacrée au commerce en ligne de ces mêmes 365 espèces sur les années 2017 et 2018 a permis d'affiner les résultats obtenus[1]. Le nombre d'annonces sur des produits contenant (ou prétendant contenir) des spécimens d'espèces inscrites aux annexes CITES et indiquant leur nom scientifique complet est resté assez stable puisqu'il s'est élevé à 14 000 en 2017 et à 13 000 en 2018. Le nombre d'annonces portant sur des spécimens soumis au contrôle de la CITES au titre d'annotations relatives aux espèces s'est élevé à 4500 en 2017 et à 4900 en 2018. Les annonces relatives à des spécimens soumis à des contrôles CITES portaient fréquemment sur *Aloe arborescens, Aloe ferox*, *Encephalartos* spp., *Euphorbia tirucalli*, *Galanthus nivalis, Hoodia* spp., *Turbinicarpus* spp. (espèces

[1] *Jina Choi, mémoire de mastère CITES en gestion, conservation et contrôle des espèces faisant l'objet d'un commerce international, Université internationale d'Andalousie, sous la supervision de David Roberts, Université du Kent, inédit.*

inscrites à l'Annexe I), *Panax ginseng,* et *Panax quinquefolius*. La plupart de ces espèces étaient régulièrement proposées à la vente aussi bien en 2017 qu'en 2018, signe d'une structure d'échanges stable. Sur les 4900 produits relevant de la réglementation CITES proposés sur eBay en 2018, 63,1% étaient destinés au commerce international, mais seules 21 annonces indiquaient dans le descriptif que la réglementation CITES s'appliquait.

10. Le Secrétariat prend note du fait que les travaux de recherche mentionnés aux paragraphes 8 et 9 ont été limités par un faible éventail de PMA, par le fait que l'étude portait essentiellement sur les produits dont le nom scientifique était précisé, et par le temps restreint consacré à l'examen des deux plateformes de vente en ligne. On ignore par ailleurs à combien s'élève le nombre de transactions commerciales portant sur des produits relevant de la CITES réalisées chaque année car on ne sait pas vraiment combien de temps les annonces restent en ligne et à quelle fréquence de nouvelles annonces paraissent. Les travaux de recherche ont principalement reposé sur des tâches manuelles chronophages et on ignore si des transactions en ligne ont également lieu sur d'autres plateformes. Pour combler ces lacunes, le Secrétariat a lancé un défi (sous forme de description de problème), lequel a rencontré un grand succès, dans le cadre du « Zoohackaton » sur le commerce illégal des espèces sauvages qui s'est tenu à Genève en 2019, avec le soutien de la Mission permanente des États-Unis d'Amérique auprès des Nations Unies et d'autres organisations internationales. Il a envisagé la mise au point d'un algorithme de recherche automatisée permettant de passer au crible de manière systématique l'intégralité des plateformes de commerce électronique afin de déceler des produits de PMA relevant de la réglementation CITES et a formulé une première série de propositions sur la faisabilité du projet et sur les approches susceptibles de permettre la conception d'un tel outil. Pour approfondir le sujet, les organisateurs du Zoohackaton ont décidé de soumettre le même défi à 15 autres Hackatons dans le monde. En collaboration avec le pôle en Sciences Digitales pour l'Environnement et la Santé de l'Université de Genève, il est envisagé de proposer à des étudiants, à l'automne 2020, de rédiger un éventuel mémoire de mastère en informatique qui pourrait permettre d'améliorer les versions préliminaires de cet outil. Enfin, une autre solution pour recueillir davantage de données pourrait consister à porter les espèces CITES de PMA à l'attention de la Coalition mondiale de lutte contre le trafic en ligne d'espèces sauvages ou d'autres initiatives traitant de ce sujet (voir également le document CoP18 Doc. 33.1 *Lutte contre la cybercriminalité liée aux espèces sauvages*).

Établir si les bases de données existantes contenant les noms commerciaux des espèces de plantes médicinales et aromatiques CITES peuvent être reliées à la base de données sur la Liste des espèces CITES

11. Relier la *Liste des espèces CITES* à une autre base de données sur les plantes médicinales et aromatiques indiquant leurs noms commerciaux pourrait faciliter et renforcer la mise en œuvre de la Convention.

    a) Pour les organes de gestion et les points focaux pour la lutte contre la fraude : Être en mesure de trouver rapidement le nom scientifique de produits susceptibles de contenir des ingrédients provenant d'espèces de PMA inscrites aux annexes CITES mais portant uniquement un nom commercial non scientifique peut aider à déterminer si certains produits contiennent des spécimens d'espèces CITES dont le commerce est réglementé. Ceci est d'autant plus utile que de nombreux produits de PMA portent des noms et des étiquettes en plusieurs langues qui ne mentionnent pas le nom botanique des ingrédients d'origine végétale. À l'heure actuelle, les organes de gestion CITES ne disposent que très peu de recours en cas de produits ne portant pas d'étiquette indiquant le nom scientifique des plantes concernées, ce qui le plus souvent ne les rend pas « facilement identifiables » au sens de la Résolution Conf. 9.6 (Rev. CoP16) *Commerce des parties et produits facilement identifiables*. Cet accès à des informations complètes sur les noms commerciaux des PMA permettrait de considérablement renforcer la capacité à reconnaître, tracer et identifier aisément des produits de PMA inscrites aux annexes CITES.

    b) Pour les autorités scientifiques et les chercheurs, cet outil contribuerait à améliorer la transparence et la traçabilité des filières commerciales en rendant les produits facilement reconnaissables d'après leur dénomination dans le commerce, leur nom en pharmacie ou leur appellation courante. La prise de décisions au niveau de chaque avis de commerce non préjudiciable, des propositions d'inscription aux annexes ou de la surveillance globale des filières du commerce d'espèces CITES de PMA pourrait ainsi prendre en compte un plus large éventail de produits contenant des spécimens d'espèces CITES.

    c) Pour l'ensemble de la communauté CITES, disposer d'informations plus complètes sur la dénomination dans le commerce, le nom en pharmacie ou l'appellation courante des espèces CITES de PMA permettrait de mieux cerner et d'assurer une meilleure surveillance des transactions en ligne portant sur ces espèces, comme indiqué au paragraphe 11a) ci-dessus. Une fonction de recherche pourrait améliorer la traçabilité des spécimens de PMA dans le commerce en informant les acteurs à tous les

stades de la chaîne d'approvisionnement des dispositions CITES applicables (par exemple l'obtention de permis et de certificats).

d) Comme indiqué dans le document d'information PC24 Inf. 7, aucune définition des plantes médicinales et aromatiques n'a été adoptée par la CITES. Ces espèces ne sont pas définies en termes de taxonomie botanique, de caractéristiques aromatiques ou d'efficacité médicinale mais plutôt selon des usages déterminés par des facteurs culturels, lesquels sont en évolution constante. Le terme « plantes médicinales et aromatiques » englobe ainsi des milliers d'espèces. De précédentes recherches sur les PMA inscrites aux annexes CITES (présentées p. ex. dans les documents d'information PC23 Inf. 10 et PC24 Inf. 12) ont permis de définir des critères de sélection plus ou moins arbitraires. Il s'ensuit qu'en règle générale, ces études ne peuvent pas être mises en comparaison, si bien qu'il est difficile de définir avec précision quelles tendances se dégagent s'agissant du commerce d'espèces CITES de PMA. Créer une base de données mondiale de référence sur les plantes médicinales et aromatiques pourrait s'apparenter à donner une définition complète de ce groupe de taxons et permettrait ainsi de faire des études comparatives plus fiables des espèces CITES de PMA dans le commerce.

12. Le Secrétariat a entamé des discussions avec le Medicinal Plant Names Services (MPNS) de Kew et le Centre mondial de surveillance de la conservation de la nature du Programme des Nations Unies pour l'environnement (PNUE-WCMC), lequel héberge et assure la mise à jour de la *Liste des espèces CITES* et de la base de données connexe Species+. Le MPNS est un service d'indexation qui s'emploie à établir une nomenclature de référence des plantes médicinales à l'échelle mondiale. Il dispose d'un portail en ligne qui permet de consulter des données sur les plantes médicinales et des articles de médecine à l'aide de dénominations utilisées en pharmacie, de noms de médicaments, d'appellations courantes ou du nom scientifique de telle ou telle plante. La 9e version de sa base de données (en date de janvier 2020) contient 27 734 espèces de plantes médicinales, reliées à 266 000 noms scientifiques de plantes (provenant des bases taxonomiques de référence de Kew) et 210 000 dénominations non scientifiques, noms en pharmacie, noms de médicaments et noms courants de plantes médicinales en plusieurs langues et écritures. Ces informations proviennent de 170 sources réglementaires relatives aux plantes médicinales et à la santé qui couvrent les six régions CITES. Le MNPS constitue ainsi la base de données probablement la plus complète sur les noms commerciaux des plantes médicinales.

13. Le MPNS de Kew et le PNUE-WCMC ont tous deux aimablement accepté de procéder à un premier échange de données expérimental visant à mieux cerner les formats de données utilisés de part et d'autre, les exigences en termes d'harmonisation et d'autres caractéristiques propres aux deux bases de données. Cette démarche a permis de définir des objectifs, des procédures, des obstacles à surmonter et des mesures à mettre en place pour intégrer les noms commerciaux du MPNS relatifs aux espèces CITES de PMA dans la *Liste des espèces CITES*.

Décision 18.300, paragraphe b) ii)

Progrès réalisés dans l'examen des travaux en cours sur la chaîne de l'offre et la chaîne de valeur durables et traçables pour les produits de plantes médicinales et aromatiques, en mettant l'accent sur les programmes, les normes et les lignes directrices en matière de certification

14. Dans de nombreux secteurs, des programmes, normes et lignes directrices en matière de certification ont été prévus pour évaluer les résultats à l'aune d'un ensemble de critères. Ils peuvent relever de gouvernements, de tiers ou d'un secteur donné. Dans le secteur privé, de nombreux programmes de certification facultatifs ont été créés pour répondre aux préoccupations des consommateurs sur les plans social, écologique et éthique en lien avec le cycle de vie d'un produit[2]. Les normes Forest Stewardship Council (FSC), FairWild ou Biotrade figurent parmi les exemples les plus connus dans le domaine de l'utilisation durable de la biodiversité de la flore. Les sociétés désireuses d'obtenir une certification de ce type sont tenues d'apporter la preuve qu'elles respectent bien les principes de durabilité, entre autres, ce qui doit être vérifié et confirmé par un organisme de certification et par l'organisme de normalisation concerné en tant que tiers indépendants.

15. Le Secrétariat a connaissance de quelques cas d'entreprises au bénéfice d'une certification qui exportent des espèces de plantes CITES. Il s'agit notamment d'entreprises jouissant de la certification FSC qui exportent des espèces de bois CITES (*Cedrela*) du Brésil et du Guatemala et d'un projet en cours visant à obtenir la certification FairWild pour des exportations de *Nardostachys grandiflora* en provenance du Népal. En outre, bien qu'il ne s'agisse pas d'une espèce CITES, une société exportatrice de *Boswellia* en

[2] *Un outil en ligne permettant de comparer et de filtrer près de 250 normes, critères et indicateurs employés peut être consulté ici.*

provenance de Somalie a récemment obtenu la certification FairWild. Ces cas semblent néanmoins peu répandus et il importe de recevoir des données d'expérience plus concrètes sur l'intérêt de la certification pour la mise en œuvre de la CITES. TRAFFIC, en collaboration avec l'autorité scientifique de l'Allemagne, évalue actuellement de quelle manière les programmes de certification pourraient aider les autorités scientifiques et les organes de gestion dans la mise en œuvre des dispositions CITES sur le commerce d'espèces de plantes inscrites à l'Annexe II, en accordant une attention particulière à la certification des prélèvements de *Nardostachys grandiflora* au Népal (voir les documents d'information PC24 Inf. 12 et CoP18 Inf. 36).

16. Dans le document d'information CoP18 Inf. 36, quatre programmes de certification sont évalués [norme FairWild, Union for Ethical BioTrade/UTZ, Forest Stewardship Council (FSC) et Réglementation de l'UE sur les produits biologiques] à l'aune des concepts et des orientations non contraignantes pour la formulation d'avis de commerce non préjudiciable recommandés dans la Résolution Conf. 16.7 (Rev. CoP17), ainsi que des dispositions sur l'acquisition légale de spécimens énoncées à l'Article IV, paragraphe 2b) de la Convention. Il ressort de cette évaluation que la norme FairWild dispose d'indicateurs pertinents eu égard à toutes ces dispositions. Quant aux indicateurs de l'UEBT/UTZ et du FSC, ils pourraient être utiles aux organes de gestion et aux autorités scientifiques pour établir des avis de commerce non préjudiciable (ACNP) et des avis d'acquisition légale (AAL), mais une partie des indicateurs sont propres à un site donné et non à une espèce. Un tableau récapitulatif des principales conclusions de cette étude figure en annexe 1 au présent document.

17. En septembre 2018, TRAFFIC et l'Allemagne ont remis un questionnaire aux organes de gestion et aux autorités scientifiques CITES ainsi qu'aux acteurs du secteur sur les PMA inscrites aux annexes CITES et les dispositifs de certification volontaires. Dix-huit Parties y ont répondu [Afrique du Sud, Allemagne, Autriche, Belgique, Canada, Chine, Croatie, États-Unis d'Amérique (deux réponses), Lettonie, Mexique, Monténégro, Norvège, Portugal, Royaume-Uni de Grande-Bretagne et d'Irlande du Nord (deux réponses), Slovaquie et Suisse] ainsi que 15 acteurs du secteur. La moitié des participants à l'étude travaillant pour les autorités CITES ont estimé que les documents fournis dans le cadre de la certification pouvaient aider à l'émission d'ACNP et les trois quarts ont considéré qu'ils pouvaient contribuer à l'élaboration d'AAL. Les documents jugés les plus importants sont présentés dans le tableau 1. Il a été demandé aux entreprises d'indiquer s'il existait des restrictions quant aux documents qu'elles pouvaient communiquer aux organes de gestion CITES ; sur 15 entreprises participantes, 10 ont déclaré qu'il n'y avait aucune restriction (deux ont indiqué qu'il existait restrictions et trois n'ont pas répondu à la question).

Tableau 1 : Cinq réponses les plus fréquentes des représentants des autorités CITES à la question de savoir quels documents provenant des systèmes de certification pouvaient les aider dans l'élaboration d'ACNP et d'AAL (Timoshyna et al., 2019)

Documents pouvant aider à l'émission d'ACNP	**Documents pouvant aider à l'émission d'AAL**
Plan de prélèvement	Attestation d'origine
Description des espèces	Informations sur les systèmes de traçabilité
Estimations de populations	Identifiants uniques
Zones et méthodes de suivi	Rapports sur les quantités de spécimens de l'espèce utilisées
Méthodes de collecte	Documents sur la réglementation au niveau local

18. Dans le même ordre d'idées, TRAFFIC et l'autorité scientifique de l'Allemagne ont organisé un atelier à l'intention des parties prenantes (janvier 2019, Cambridge, Royaume-Uni) afin d'évaluer si les systèmes de certification pouvaient aider les organes de gestion et les autorités scientifiques CITES dans la mise en œuvre des processus prévus au titre de l'Annexe II de la CITES. Cet atelier a réuni des représentants des autorités scientifiques et des organes de gestion CITES de l'Afrique du Sud, de l'Allemagne, de la Chine, du Mexique, de la Norvège, du Portugal, de la République de Corée, du Royaume-Uni, de la Suisse et du Liechtenstein, du Secrétariat CITES, d'associations professionnelles (American Herbal Product Association et Natural Resources Stewardship Circle), ainsi que des représentants d'entreprises, d'organes du FSC, de FairWild et de BioTrade et d'organisations intergouvernementales et non gouvernementales. Les représentants de l'industrie et des autorités CITES ont convenu que la certification pouvait être utile dans la mise en œuvre de la CITES pour les PMA inscrites à l'Annexe II, tout en étant conscients qu'une certification au niveau local ou régional ne parviendrait pas à fournir toutes les informations nécessaires sur les prélèvements et l'état de conservation des espèces au niveau national. Les deux groupes ont estimé que les ACNP, les AAL et le processus d'examen du commerce important pouvaient bénéficier du savoir-faire technique, des informations relatives à l'évaluation des ressources sur le terrain, des plans de gestion, des audits externes et des éléments en matière de traçabilité des produits exigés par les sociétés certifiées. Ils ont également conclu que les programmes de certification s'appuient généralement sur des principes relatifs

au partage des avantages, au respect des droits coutumiers et veillent à ce que les auteurs des prélèvements et leur communauté en tirent profit, ce qui va au-delà des exigences prévues pour l'obtention de permis CITES tout en s'inscrivant dans le cadre des travaux sur la CITES et les moyens d'existence. Les participants ont convenu que des approches fondées sur la certification seraient particulièrement utiles pour les taxons présents dans le commerce international essentiellement prélevés dans la nature, commercialisés en grandes quantités, et dont les produits présentent une valeur importante dans les pays de destination s'intéressant fortement aux programmes de certification et capables d'assumer les coûts du processus de certification (document d'information CoP18 Inf. 36). Au nombre des espèces CITES de PMA proposées à titre d'exemple figuraient *Aniba rosaeodora*, *Euphorbia antisyphilitica*, *Nardostachys grandiflora, Prunus africana, Hydrastis canadensis* et *Panax quinquefolius*.

19. Les participants à l'atelier ont recommandé d'élaborer des orientations sur l'intérêt que peut présenter la certification pour l'émission d'ACNP et d'AAL concernant les PMA et de définir les programmes de certification, les normes et les lignes directrices les plus appropriés, y compris parmi les systèmes mis en place au niveau national, en fonction de leur degré d'équivalence avec les mesures CITES.

Décision 18.300, paragraphe b) iii)

Progrès réalisés dans l'examen des études de cas tenant compte des connaissances locales et traditionnelles et des évaluations, du suivi et de la gestion participatifs des espèces de plantes médicinales et aromatiques CITES

20. Conformément à décision 18.300, dans le présent document, l'expression '*connaissances locales et traditionnelles*' s'entend de *connaissances détenues par les communautés ou acteurs locaux quant aux populations d'espèces présentes au niveau local, fruit de leur propre expérience, de leurs observations ou de leurs expérimentations ou découlant d'un transfert de connaissances non scientifiques et informelles de la part d'autres acteurs ou membres de communautés au niveau local*. Le Secrétariat précise cependant que différentes expressions sont utilisées dans les documents et les procédures d'élaboration de politiques générales pour désigner ce type de connaissances, notamment : savoirs traditionnels ou autochtones, connaissances écologiques locales ou traditionnelles, connaissances autochtones et locales ou savoirs traditionnels autochtones.

21. La nécessité d'intégrer les connaissances locales, autochtones et traditionnelles dans les politiques relatives à la biodiversité est mise en avant dans le cadre conceptuel et les procédures d'évaluation de la Plateforme intergouvernementale scientifique et politique sur la biodiversité et les services écosystémiques (IPBES) (Décision IPBES-2/4, IPBES/5/15, IPBES/3/INF/7). C'est également un objectif majeur dans le cadre de plusieurs procédures prévues au titre de la Convention sur la diversité biologique, notamment du Protocole de Nagoya sur l'accès aux ressources génétiques et le partage juste et équitable des avantages découlant de leur utilisation. Dans le cadre de la CITES, l'utilité des connaissances locales et traditionnelles dans l'élaboration d'ACNP est reconnue au paragraphe 1 a) x) de la Résolution Conf. 16.7 (Rev. CoP17) , *Avis de commerce non préjudiciable*. De même, la prise de décisions participative est au cœur de la Résolution Conf. 13.2 (Rev. CoP14), *Principes et directives d'Addis-Ababa pour l'utilisation durable de la diversité biologique*. Ce deux notions sont également mises en avant dans les sections consacrées à l''*autonomisation des communautés rurales*' et à l''*engagement des communautés rurales à combattre le commerce illégal des espèces sauvages*' figurant dans la Résolution Conf. 16.6 (Rev. CoP18), *La CITES et les moyens d'existence*. De multiples orientations sur l'élaboration d'ACNP font également mention de connaissances locales et traditionnelles, d'évaluations participatives et du suivi et de la gestion participatifs des espèces CITES (voir document AC31 Doc. 14.1/PC25 Doc. 17, *Avis de commerce non préjudiciable*). L'intégration des connaissances locales et traditionnelles dans les processus CITES se fait pour certaines espèces d'animaux élevés en ranch (p. ex. les crocodiles) et d'autres espèces utilisées comme trophées de chasse (p. ex. le léopard). S'agissant des autres taxons, notamment les PMA, il est rare de trouver des orientations sur l'utilisation de connaissances locales et traditionnelles et sur la réalisation d'évaluations participatives dans les documents sur les ACNP, et les exemples concernant leur application sont peu fréquents.

22. Comme indiqué dans le document CoP18 Doc. 55, les PMA sont souvent d'une importance fondamentale sur le plan culturel. L'expérience et les expérimentations traditionnelles de longue date peuvent déboucher sur des connaissances en matière de besoins écologiques, de dynamique des populations et de méthodes de prélèvement durables. Les savoirs locaux et traditionnels peuvent être mis à profit pour mieux comprendre et anticiper des phénomènes naturels et ils peuvent être intégrés dans des stratégies globales de suivi et de gestion dans le cadre d'une collaboration à long terme (Berkes, 2000 ; Chamberlain et al., 2018 ; Sheil et al. 2015). On considère souvent qu'il est plus simple et moins onéreux d'interroger des communautés locales sur les PMA que de mener des recherches en écologie (Berkes, 2000, Rist et al.,

2010 et Ziembicki et al., 2013). La participation des communautés peut favoriser l'acceptation au niveau local, la durabilité, et des moyens d'existence plus importants au niveau local ; c'est également un moyen de contribuer aux travaux sur la CITES et les moyens d'existence et de compléter les approches définies dans le *Manuel sur la CITES et les moyens d'existence*. Les connaissances locales et traditionnelles sont particulièrement utiles dans la constitution de longues séries chronologiques, la consignation d'observations et de variations, et la validation d'hypothèses pertinentes (voir également Fraser et al., 2013 ; Gilchrist et al. 2015 : Hellier at el., 1999 ; Rist et al. 2010 ; Sobral et al. 2017 et Turvey et al. 2013).

23. Pour s'acquitter de sa mission au titre du paragraphe b) iii) de la décision 18.300, le Secrétariat a passé en revue différents documents pertinents dont une douzaine d'études de cas publiées sur l'utilisation de connaissances locales et traditionnelles dans le cadre d'évaluations de la biodiversité. Ces monographies vont d'études approfondies des connaissances locales et traditionnelles aux fins de la gestion d'espèces précises à l'intérieur de sites particuliers [Rist et al. (2010); Senkoro et al. (2019)] à des études sur l'évolution des populations et l'état de conservation de plusieurs espèces à l'échelle régionale [Parry and Perez (2015) ; Turvey et al. (2013) ; Ziembicki et al. (2013)]. Pour élargir l'éventail de données d'expérience disponibles et obtenir d'autres études de cas, le Secrétariat a élaboré un court questionnaire et pris contact avec l'autorité scientifique des États-Unis d'Amérique, le Groupe de spécialistes des plantes médicinales de l'Union internationale pour la conservation de la nature (UICN), l'Unité de soutien technique de l'IPBES sur les savoirs locaux et autochtones hébergée par l'UNESCO, TRAFFIC, Plants and People International, le Réseau suisse d'ethnobiologie et le Dr Tomasini, chercheur principal et auteur de comparaisons quantitatives de connaissances locales et scientifiques en vue de l'évaluation et de la conservation de populations de PMA. Grâce aux contacts rendus possibles par le biais de ces réseaux, le Secrétariat a réalisé des entretiens avec 13 spécialistes. Il s'est également appuyé sur le récent ouvrage intitulé *Guidance for Integrating Indigenous and Local Knowledge (ILK) in IUCN Red List Assessments*' (Cross et al. 2017) qui a été élaboré sous l'égide du Groupe de spécialistes de l'utilisation durable et des moyens d'existence durables de l'UICN.

24. Dans toute la mesure du possible, la priorité a été accordée aux études de cas et aux données d'expérience concernant des espèces de PMA inscrites annexes CITES. Au nombre des espèces CITES de PMA ayant fait l'objet d'études de cas pertinentes qui ont pu être retrouvées figuraient : le ginseng et l'hydraste du Canada (États-Unis d'Amérique et Canada), *Orchis* spp. (Albanie), *Prunus africana* (Cameroun), *Nardostachys grandiflora* et *Dendrobium nobile* (Chine). D'autres monographies qui semblaient rendre compte d'expériences utiles et transférables concernant d'autres espèces, notamment en ce qui concerne les méthodes et les approches employées, ont également été prises en compte. Le questionnaire est présenté en annexe 2 au présent document et la liste des spécialistes interviewés en annexe 3. Les études de cas figurent en annexe 4. Pour donner une idée générale de leur utilité dans l'élaboration d'ACNP, elles sont classées eu égard aux critères A à H énoncés au paragraphe 1 a) ix) de la Résolution Conf. 16.7 (Rev. CoP17), *Avis de commerce non préjudiciable*. Elles ont ensuite fait l'objet d'une synthèse en fonction des espèces et de l'échelle géographique étudiées, des méthodes de travail utilisées sur le terrain pour rassembler des connaissances et favoriser la participation, des méthodes employées pour accroître la validité objective des connaissances accumulées et pour réduire d'éventuels biais et sont accompagnées des conclusions des études de cas.

25. Les **12 études de cas** passées en revue couvrent toutes les régions CITES (Amérique centrale et du Sud et Caraïbes : trois études de cas ; Amérique du Nord : trois ; Afrique : deux ; Asie : deux ; Europe : une ; Océanie : une]. Chacune décrit les connaissances locales et traditionnelles rattachées à tel ou tel taxon et l'utilisation qui en est faite. Cinq études se concentrent sur une espèce précise (par exemple, au Mozambique, les arbres de l'espèce *Warburgia salutaris*, aux vertus médicinales ; Senkoro et al., 2019). Sept études comparent les méthodes d'utilisation des connaissances locales et traditionnelles pour la gestion de plusieurs espèces ou de taxons supérieurs (par exemple des évaluations participatives des ressources de six taxons de PMA, dont *Orchis* spp., en Albanie ; Tomasini and Theilade 2019). Huit études de cas se concentrent sur des échelles spatiotemporelles limitées et courtes. A contrario, quatre études de cas démontrent que les connaissances locales et traditionnelles collectées de manière systématique auprès d'un nombre suffisant de sources dans des zones géographiques plus vastes peuvent être regroupées en évaluations spatiotemporelles à grande échelle et semi-quantitatives des populations : l'intégralité de l'État d'Amazonie au Brésil (Parry et Perez 2015), le fleuve Yangtze, en Chine (Turvey and al. 2013), des cours d'eau isolés au Canada (Fraser et al. 2013) et des territoires dans le nord de l'Australie (Ziembicki et al. 2013). Cinq études de cas portent exclusivement sur des plantes, deux comparent des taxons de plantes et d'animaux, et cinq sont consacrées à des taxons d'animaux mais s'appuient sur des méthodes qui semblent pertinentes pour les espèces végétales. Sur les sept études de cas portant sur des espèces de plantes, quatre se concentrent expressément sur des PMA et trois sur des connaissances locales et traditionnelles relatives à des taxons de plantes à usages divers, dont certains sont également connus au titre de PMA [par exemple les connaissances sur *Eucalyptus* spp. dans le cadre de la collecte de bois de chauffe (Jones et

al., 2008)]. Globalement, les 12 études de cas décrivent comment les connaissances traditionnelles sont mises à profit aux fins de la gestion des espèces pour 67 espèces de plantes et 106 taxons d'animaux.

26. Sur les **13 spécialistes interviewés**, la majorité a apporté des données d'expérience relevant de plusieurs études de cas. Globalement, ces entretiens ont permis de compléter les analyses documentaires en fournissant des informations sur 28 études de cas supplémentaires provenant de chacune des régions CITES. Six spécialistes ont fait référence à des études de cas concernant l'Amérique du Nord, cinq à des études de cas concernant l'Afrique, deux à des études de cas concernant l'Asie, deux à des études de cas concernant l'Amérique centrale et l'Amérique du Sud, et deux à des études de cas concernant l'Europe. Un spécialistes a apporté des informations dans le cadre d'études de cas portant sur l'Océanie. Vingt-quatre études de cas portent sur des espèces précises de PMA. Certaines de ces espèces sont mentionnées dans plusieurs études (p. ex. *Prunus africana*, mentionnée par Abdon Awono et Sarah Laird). Au total, ces 24 études de cas portent sur 19 espèces de PMA, dont plusieurs sont inscrites aux annexes CITES (*Cistanche deserticola*, *Dendrobium nobile*, *Hydrastis canadensis, Nardostachys grandiflora, Panax quinquefolius,* et *Prunus africana).* Quatre études de cas portent sur des groupes plus importants de PMA (plusieurs études traitant de connaissances locales et traditionnelles relatives aux PMA à Madagascar, au Mozambique et au Pérou sont mentionnées par Sarah-Ian Mathez-Stiefel, et une étude de cas sur les PMA en Égypte est mentionnée par Marwa Halmy). Une étude de cas fait état d'une approche spécifique pour les évaluations participatives des espèces (p. ex. le modèle canadien permettant d'intégrer des connaissances locales et traditionnelles dans les évaluations des espèces par le biais d'un processus de consultation institutionnalisé (Sous-comité sur les connaissances traditionnelles autochtones du Comité sur la situation des espèces en péril au Canada, COSEPAC, mentionné par Gloria Goulet et Danna Leaman).

27. Il ressort de la synthèse des études de cas que les connaissances locales et traditionnelles, ainsi que la gestion et le suivi participatifs, peuvent être utiles à de nombreux égards s'agissant de l'élaboration d'ACNP, notamment en ce qui concerne chacun des critères A à H énoncés au paragraphe 1 a) ix) de la Résolution Conf. 16.7 (Rev. CoP17), *Avis de commerce non préjudiciable* (voir annexe 4). Les études de cas font état de plusieurs méthodes de travail sur le terrain pour la collecte de connaissances locales et traditionnelles, ainsi que de différentes approches participatives pour les évaluations des espèces, lesquelles pourraient servir d'exemple pour la mise en œuvre d'approches similaires relatives à l'élaboration d'ACNP concernant des espèces CITES de PMA. Elles présentent également plusieurs approches permettant de vérifier la fiabilité, la validité, l'exhaustivité et l'objectivité des informations recueillies. Lors de l'élaboration d'ACNP concernant des espèces CITES de PMA et s'appuyant sur des connaissances locales et traditionnelles, ces approches jouent un rôle crucial en permettant d'établir des ACNP fondés sur la science qui garantissent une utilisation non préjudiciable des espèces CITES de PMA. Ces points sont analysés plus en détail dans l'annexe 5.

Décision 18.300, paragraphe b) iv)

Recommandations pour, entre autres, compléter les outils existants relatifs à l'application de la Convention pour les plantes médicinales et aromatiques CITES, en créant des synergies, le cas échéant, avec les organisations et acteurs intergouvernementaux compétents

28. Sur la base des analyses figurant dans le présent document, les données disponibles laissent entendre que le commerce international d'espèces de PMA est important et s'intensifie, mais que le suivi et le signalement de cas restent lacunaires. La complexité de ce type de commerce, ainsi que les noms pharmaceutiques et courants sous lesquels les produits CITES de PMA sont commercialisés, demeurent un défi. Pour aider les autorités nationales CITES à faire appliquer la réglementation CITES relative aux espèces de PMA, améliorer la transparence et faire mieux connaître les règlements CITES aux parties prenantes, et pour permettre un meilleur suivi et la communication d'informations sur le commerce international de ces espèces, il semble essentiel que la *Liste des espèces CITES* indique le nom scientifique mais aussi la dénomination dans le commerce, le nom en pharmacie et l'appellation courante des espèces de PMA inscrites aux annexes CITES. Selon le Secrétariat, le MPNS de Kew serait le meilleur partenaire à cet effet au vu du caractère exhaustif de sa base de données et de sa vaste connaissance des exigences des organismes de réglementation (pharmaceutique) s'agissant des espèces de PMA. D'autres mesures susceptibles d'améliorer le contrôle et la communication d'informations sur le commerce sont présentées en détail dans le document d'information CoP18 Inf. 11.

29. Les systèmes de certification, les normes et les lignes directrices, ainsi que les mécanismes volontaires et fondés sur le marché, peuvent aider l'industrie à améliorer la durabilité du commerce des espèces de PMA et les moyens d'existence des populations rurales au niveau local ou national. En outre, les informations produites dans le cadre des processus de certification peuvent aider les autorités scientifiques et les organes de gestion CITES dans l'élaboration d'ACNP et d'AAL. Il est possible de renforcer la CITES et de favoriser

la durabilité du commerce de PMA au moyen de mesures incitatives visant à pousser l'industrie à faire appel à la certification pour les PMA inscrites aux annexes CITES. Des orientations pourraient également être élaborées pour expliquer de quelle manière la certification peut contribuer à l'établissement d'ACNP et d'AAL, et pour donner des conseils sur la façon de rendre compatibles les systèmes de certification, les normes et les lignes directrices et les règlements de la CITES.

30. Il ressort des 40 études de cas sur des espèces de PMA et d'autres taxons inscrits aux annexes CITES que les connaissances locales et traditionnelles, ainsi que les évaluations, le suivi et la gestion participatifs, peuvent fournir des informations sur de nombreux points essentiels pour l'élaboration d'ACNP. Dans certains cas, la collecte de connaissances locales et traditionnelles peut être le moyen le plus économique de rassembler des informations utiles pour l'émission d'ACNP. Dans l'idéal, les informations provenant du suivi écologique et des connaissances locales et traditionnelles devraient se compléter, mais même dans le cas où aucune autre donnée ne serait disponible, les connaissances traditionnelles peuvent déjà fournir des informations cruciales. La collecte, la vérification et l'étude des connaissances traditionnelles nécessitent des compétences et des méthodologies particulières. Des orientations spécifiques pourraient être élaborées pour aider les autorités scientifiques à mettre à profit les connaissances locales et traditionnelles pour élaborer des ACNP concernant des espèces CITES de PMA.

Recommandations

31. Le Comité pour les plantes est invité à créer un groupe de travail intersessions sur *les plantes médicinales et aromatiques* en appui à la décision 18.302, lequel sera chargé de :

    a) examiner le rapport du Secrétariat sur les progrès accomplis dans la mise en œuvre de la décision 18.300, tels que décrits dans le présent document et ses annexes ;

    b) tenir compte, conformément à la décision 18.302, du document d'information CoP18 Inf. 11 ;

    c) rédiger des recommandations en prévision des rapports à soumettre au Comité permanent ou à la 19e session de la Conférence des Parties ; et

    d) soumettre les résultats de ses travaux au Comité pour les plantes pour examen.

Matrix comparing the general guidelines for making NDFs (Resolution Conf. 16.7 (Rev. CoP17) on *Non-detriment findings*) **and LAFs** (Article IV, paragraph 2 (b) of the Convention) **against four certification standards** (FairWild Standard, Union for Ethical BioTrade/UTZ, Forest Stewardship Council (FSC) and EU Organic Regulations)

Source: CoP18 Inf. 36, Table 1

NDFs Res. Conf. 16.7 (Rev. CoP17).	9-step NDF for perennial plants (steps where relevant information would be collated)	FairWild Standard Version 2.0 Performance Indicators	Field Checklist for UEBT/UTZ Certified Herbal Tea	FSC International Generic Indicators	EU Organic Regulation, from: (EC) 834/2007 and (EC) 889/2008
A. Species biology and life-history characteristics	Steps 1 and 5	full consideration of guidelines	partial consideration of guidelines	partial consideration of guidelines	no relevant indicator
B. species range (historical and current);	Steps 4, 5 and 6	full consideration of guidelines	partial consideration of guidelines	full consideration of guidelines	partial consideration of guidelines
C. population structure, status and trends (in the harvested area, nationally and internationally);	Steps 4, 5 and 6	full consideration of guidelines	partial consideration of guidelines	partial consideration of guidelines	partial consideration of guidelines
D. threats	Steps 4, 5, 6 and 7	full consideration of guidelines	full consideration of guidelines	partial consideration of guidelines	partial consideration of guidelines
E. historical and current species-specific levels and patterns of harvest and mortality (e.g. age, sex) from all sources combined	Steps 3, 4, 5, 6 and 7	full consideration of guidelines	partial consideration of guidelines	partial consideration of guidelines	no relevant indicator
F. management measures currently in place and proposed, including adaptive management strategies and consideration of levels of compliance	Step 8.	full consideration of guidelines	partial consideration of guidelines	full consideration of guidelines	no relevant indicator
G. population monitoring	Steps 6, 7 and 8	full consideration of guidelines	partial consideration of guidelines	partial consideration of guidelines	no relevant indicator
H. conservation status	Steps 4 and 6	full consideration of guidelines	partial consideration of guidelines	partial consideration of guidelines	no relevant indicator
Article IV, paragraph 2 (b)					
a Management Authority of the State of export is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora [i.e. Legal Acquisition Findings – LAF]	Step 3	full consideration of guidelines	partial consideration of guidelines	partial consideration of guidelines	partial consideration of guidelines

Questionnaire for expert interviews regarding Decision 18.300, paragraph (b), iii

Interviewee:
State / Institution:
Role:
How we got the contact / who recommended the contact:
Reason for the recommendation:

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Please note that we are aware of some terminological diversity regarding the topic of this interview. Local knowledge is variously referred to as traditional or indigenous knowledge, as well as traditional or local ecological knowledge (TEK, LEK). For the purpose of this interview, our interest is the *knowledge that local stakeholders or communities have about the populations of locally occurring CITES-listed medicinal and aromatic plant species (MAPs), through their own experience, observation or experimentation, or through non-formal and non-scientific knowledge transfer from other local stakeholders or community members*.

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Instances of using local knowledge in species assessment, monitoring, or management:

1) Have you been involved in assessments, monitoring or management efforts for CITES-listed MAPs, in which local knowledge was used? [*If so, specify species, location, time frame, objective*].
2) Are you aware of instances, in which other people or institutions used local knowledge in assessments, monitoring or management of CITES-listed MAPs? [*If so, specify responsible person / institution, species, location, time frame, objective*].
3) Are you aware instances in which local knowledge was used in the assessment, monitoring or management of other species groups? [*If so, specify responsible person / institution, species, location, time frame, objective*].

Process of using local knowledge in species assessment, monitoring, or management:

4) How was the contact with local communities or stakeholders established, and for how long were the relations maintained?
5) Who were the local communities or stakeholders that you collaborated with?
   [*Start with open question, then ask for specific categories, if required:*
   a) *Local community members who are not employed by natural resource management institutions but possess relevant knowledge (e.g. plant collectors or traders, herbal medicine practitioners, holders of traditional knowledge)*
   b) *Resident professionals, local government staff or civil servants involved in natural resource management (including local botanists or researchers from local universities if resident in the area of concern)*
   c) *Volunteers and amateurs collecting data according to predefined protocols (e.g. citizen scientists carrying out species counts or similar)*
   d) *Local authorities with leverage about community decision-making (e.g. mayors, elders, people of high standing and reputation*)].
6) How were the communities or stakeholders involved in species assessment, monitoring or management?
   a) In providing local knowledge.
      [If applicable, ask follow-up question:
      i) *What were your methods for eliciting knowledge (workshops, focus groups, interviews, questionnaires, other please explain)?*
      ii) *What information was researched? (Conservation status, -trends, and -concerns; intrinsic biological risk / vulnerability / regeneration, harvest impacts, trade impacts, species monitoring, species management, other please explain)*

iii) How did the knowledge contribute to CITES NDFs, species monitoring or management?]

b) In conducting fieldwork or implementing assessment, monitoring or management protocols.
[If applicable, ask follow-up question:
i) How were local collaborators selected and trained?
ii) What methods were used and how were they implemented?
iii) How did the fieldwork contribute to CITES NDFs, species monitoring or management?]

c) In jointly designing assessment, monitoring or management protocols.
[*If applicable, ask follow-up question:*
i) What were crucial steps of the collaboration, and what agreements were made?
ii) What methods were used and how were they implemented?
iii) How did the collaboration contribute to CITES NDFs, species monitoring or management?]

Benefits, challenges and conclusions regarding using local knowledge in species assessment, monitoring, or management

7) Which aspects of using local knowledge in species assessment, monitoring, or management do you consider successful and transferable?
8) Which aspects of using local knowledge in species assessment, monitoring, or management do you consider challenging or non-transferable?
9) If CITES was to develop guidance for using local knowledge in species assessments, monitoring and management, what would you recommend the Plants Committee to focus on – where is the most urgent need?
10) Could you recommend us any other experts to contact, or any relevant literature to consult?
11) Do you have any additional observations, suggestions or comments?

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List of interviewed experts

Name	Affiliation	Main field of relevant expertise
Ms. Yan Zeng	Chinese Academy of Sciences, Office of the China Scientific Authority for CITES	- IPBES sustainable use assessment author - NDF making and CITES NDF guidance - Community-based management of *Dendrobium nobile, Cistanche deserticola*, and *Nardostachys grandiflora* in China
Ms. Joanna Sucholas Ms. Anja zur Loye	PhD students, Universities of Regensburg, Freiburg, Germany	- Wild collection of plants and their economic importance in medicinal and health sectors (PharmaPlants project) in Poland and Romania
Ms. Christine Mitchell	Researcher, Artis College of Science, Department of Geospatial Science, Radford University, US	- Involved in US NTFP report - Extensive expertise in local knowledge for *Sabal palmetto* - Pertinent fieldwork in Bhutan, Indonesia, Micronesia (Federated States of)
Ms. Mathez-Stiefel	Senior Research Assistant, Centre for Development and Environment, University of Bern, Switzerland	- Ethnobotanical assessments of plants in Madagascar - Work with traditional healers in Mozambique - Traditional knowledge of Quechua people in Peru and Bolivia (Plurinational State of)
Mr. Rainer Luick	Professor of nature and environmental protection, University of Applied Sciences Rottenburg, Germany	- Long-standing involvement in the development of biodiversity indicators (High Nature Value Farmland Indicator, used by European Union and CBD, i.a.) - MAP wild collection and primary forests in Eastern Europe
Ms. Danna Leaman	Co-Chair IUCN Medicinal Plant Specialist Group, Red List Authority Coordinator, Canadian Museum of Nature, Canada	- National and global species assessments, including *Hydrastis canadensis* (Goldenseal), *Nardostachys grandiflora* (Jatamansi), *Panax quinquefolius* (American Ginseng) - Collaboration with the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Aboriginal Traditional Knowledge (ATK) Subcommittee - Collaboration with UNDP on involvement of traditional harvesters in development of sustainable wild harvest practice and monitoring for sustainability certification scheme for O*riganum syriacum* in Lebanon
Ms. Sarah Laird	Co-Director, People and Plants International, USA	- 20+ years of experience on research with local communities on medicinal plants, including *Prunus africana*, on Mount Cameroon
Ms. Marwa Halmy	Department of Environmental Sciences, Alexandria University, Egypt	- Collaborator in GEF-funded UNDP project coordinated by the Environmental Affairs Agency of Egypt on the sustainable use and local knowledge of MAPs by nomadic tribes of North-Western Egypt - IPBES sustainable use author
Ms. Gloria Goulet	Co-chair Aboriginal Traditional Knowledge Subcommittee, Committee on the Status of Endangered Wildlife in Canada	- Former member of COSEWIC Secretariat, lead person who set up ATK subcommittee, and its current co-Chair - Involved in many species' assessment processes (mainly fauna) from the perspective of indigenous knowledge
Ms. Marla Emery	Research Geographer, Forest Service, Northern Research Station, USA	- IPBES Sustainable Use Chair - 25+ years' experience in working with local communities and individuals that harvest plants and fungi - Expertise on Ginseng
Mr. James Chamberlain	Forest Products Research Technologist, Forest Service Southern Research Station, USA	- Long-standing experience on community-based management of *Allium tricoccum*, *Hydrastis canadensis*, *Actea racemosa* - Involved in relevant NDFs
Mr. Eric Burkhart	Director, Appalachian Botany and Ethnobotany Program, Ecosystem Science and Management Department, Pennsylvania State Univ., USA	- Ethnobotanical work with USAID in Nicaragua - Long-standing researcher and educator on MAPs and NTFPs in the Appalachian area, *Panax quinquefolius*, and *Allium tricoccum*, i.a. - Community-based research on economically important plant species in Madagascar
Mr. Abdon Awono	Center for International Forestry Research (CIFOR), Cameroon	- 20-year experience in forestry research at CIFOR in Cameroon - Focus on *Prunus africana*, among others - Expertise on value-chains

Summary of expert interviews on using local and traditional knowledge in species assessments, and of participatory monitoring and management of CITES-listed MAPs

Addressed considerations [Res. Conf. 16.7 (Rev. CoP17), para. 1 a) ix)]	**Methods used in the case study to collect local and traditional knowledge**	**Methods used in the case study to validate local and traditional knowledge and case study conclusions**	**Source**
A: Species biology & life-history B: Species range C: Population status & trends D: Threats E: Mortality from all sources F: Management measures G: Population monitoring H: Conservation status	Species: *Dendrobium nobile*, *Cistanche deserticola*, and *Nardostachys grandiflora* in China. Participatory approach: Stakeholders were contacted during face to face surveys, online contacts, or through introduction from other stakeholders, and included local village or party authorities, company or institution staff, and individuals such as religious lamas, local doctors, and teachers. Information was collected in interviews, questionnaires and information sharing forums. Contributions of local and traditional knowledge: Contributions of local knowledge included species distribution, trends, concerns, intrinsic vulnerability, habitat quality, uses, harvest impacts, trade impacts, efficiency of local monitoring, management and enforcement, similar species and hybrids or mixed species, interspecies competition, regeneration, material collection and processing, livelihoods, demand and community awareness. Communities can also contribute to the NDF itself, but depending on information confidence, the SA decides how much local knowledge the NDF can incorporate.	Validation of local and traditional knowledge: Assuring credibility is a key challenge, since local knowledge may be blurry, requires more effort to verify, and reasonable verification methods are not always straightforward. The CITES Scientific Authority of China and the Chinese Academy of Sciences used several strategies: - While scientists may not have area- or culture-specific knowledge to directly validate local knowledge, indirect validation of those aspects that are not specific to an area or culture is possible, such as species' life-history. If local knowledge is accurate on these, one can assume is may also be accurate in observing local situations. - The snowball method helps to find knowledgeable people. For example, traders tell where they got the herbs. In these local towns, there will be local agriculture or development departments, or offices, and they will lead to the local specialists and collector families. - China is planning a study to assess coherence of local knowledge and survey techniques through random sampling and sample plots. Conclusions: Local and traditional knowledge is very important in the 9-Steps NDF guidance (Wolf et al. 2016) and can contribute to almost all of its steps. It may supplement some trends and conclusions when scientific information is lacking and suggest inferences or hypothesis for testing. The importance of local knowledge should be highlighted, but the credibility challenge needs to be kept in mind, and some developing countries might not have the required capacity.	Yan Zeng interview
A: Species biology & life-history B: Species range C: Population status & trends D: Threats	Case study species: *Panax quinquefolius, Hydrastis canadensis, Pelargonium sidoides, Nardostachys jatamansi, and Origanum syriacum.* Participatory approach: a) Workshops/symposia based on pre-existing ties between national CITES Authorities and stakeholder/harvester communities; b) field research/interviews; and	Validation of local and traditional knowledge: The COSEWIC-ATK subcommittee has no standard process for data collection and collaboration between federal and territorial authorities. For a national species assessment of polar bears, there was insufficient collaboration and contradictory information between traditional and scientific knowledge, and disagreements on the weight of anecdotal behavioural information. But legally, protocols mandate to give equal weight to both. For plants, such conflicts might be less relevant. The transfer of observational, anecdotal, or non-numerical data into scientific paradigms (sustainable harvest levels, etc.) is difficult for the scientific community to understand, accept and use. There has to be a commitment on both sides to	Danna Leaman interview

E: Mortality from all sources F: Management measures G: Population monitoring H: Conservation status	c) an institutionalized consultation process (Committee on the status of endangered wildlife's aboriginal traditional knowledge sub-committee COSEWIC-ATK) that was jointly developed with Canadian First Nations organizations who have legal authority over resources in their recognized lands. The COSEWIC-ATK subcommittee has aboriginal co-chairs and developed formalized community and species assessment protocols. Contributions of local and traditional knowledge: Information for *P. quinquefolius* and *H. canadensis* contributes to species management. Scientists detected diminished genetic diversity, while local and traditional pointed out to a reduction of harvestable area and material, which were complementary insights. For *P. sidoides* in South Africa, a sustainable harvest protocol was developed to prevent a CITES listing. For *O. syriacum* in Lebanon, a standardized understanding of sustainable harvest and its regulation was developed by looking at comparative harvesting practices, and how they could be managed. In many cases, adopted practices were the old ones used by previous generations.	understand both types of knowledge at the same level. People evaluating that knowledge need to be crossing the boundary, which is very hard. There is an increasing number who cross that barrier, but they are completely oversubscribed. What is needed are bridge persons. Conclusions: There are at least two perspectives on making the use of local knowledge in species assessments. The academic community requests massive structures to manage interpersonal relations, which poses practical challenges. In contrast, the COSEWIC-ATK subcommittee has been designed by First Nation communities in collaboration with indigenous COSEWIC co-chairs. It is important to agree which questions should be asked. If questions are imposed from the outside, it is really difficult for indigenous communities to see why participation would be in their interest. Case studies are very helpful and contribute to identifying factors that made assessments successful or not; rules of engagement; good practice; and how to approach a research question. It is important to agree at the outset; to understanding that local and scientific knowledge would be treated with equal value; and to understand that information does not have to be in the same format, and does not have to be numerical to be given weight. A shared sense of purpose of what the information is used for (trust) is required.	
A: Species biology & life-history B: Species range C: Population status & trends D: Threats E: Mortality from all sources F: Management measures G: Population monitoring H: Conservation status	Species: *Prunus africana* in Cameroon. Participatory approach: One starts contacting civil society organizations already active in the field, including government, traditional authorities, non-governmental or international development organizations. In north-west Cameroon, we worked with a local organization (MOCAP) and traditional authorities. Governmental and academic institutions, including the CITES Scientific Authority (ANAFOR) and the Ministry of forestry are also involved. We explained the purpose of the assessment, its international context, and asked for their permission and collaboration. We then conduct a problem analysis workshop with several actors, and decided with whom to collaborate. Another option is to decide based on observations of how actors work in the field. Workshops also serve to jointly develop implementation strategies. In some instances, these ended up differently from what scientists envisioned beforehand. Such activities also create ownership and help to ensure the sustainability of the initiatives. Contributions of local and traditional knowledge: For species assessments, we researched how people access the products, their utilization and conservation strategies.	Validation of local and traditional knowledge: It is important to consider the gender aspect. Men and women have different knowledge. One needs to understand how communities function. Otherwise a lot of information is lost that is specific to some entities. Conclusions: While people and communities are very diverse, a bottom-up process can work everywhere. Details may change, but a common guideline is possible. Language can be a challenge in areas where local languages are spoken. Middlemen can solve the problem, but they need to be trained to translate accurately. The objective of a collaboration needs to be extremely clear. Communities will not be open if they do not accept external people wishing to collaborate with them. Therefore, things should be presented plainly, without wishful thinking or unrealistic expectations, otherwise the spirit of collaboration in the long term. During any activities, and after their conclusion, steps of the process should be explained along the way, and results should first be reported back to communities.	Abdon Awono interview

A: Species biology & life-history C: Population status & trends E: Mortality from all sources F: Management measures G: Population monitoring H: Conservation status	Species: NTFPs (*Allium tricoccum, Actea racemosa*, and more tangentially *Panax quinquefolius,* and *Hydrastis canadensis*). Participatory approach: To initiate contacts for *A. tricoccum*, I went to local onion festivals, interviewed community groups and got myself invited to go with harvesters, who were surprised about my interest. Trust building happens by spending time, conversing, and demonstrating interest. For *A. racemosa*, contacts were via industry people, not harvesters. Data collection and fieldwork was via volunteers (students, industry and NGO people). For *H. canadensis*, collaboration was with landowners. Contributions of local and traditional knowledge: For *A. racemosa*, we weighed harvests for the first time ever. Participatory below-ground biomass measurements are the only way to estimate harvestable material of *H. canadensis*. Landowners were trained in plant measurement protocols (height, leaf area, below ground biomass/harvestable material). From the next year onwards, they apply them for data collection.	Validation of local and traditional knowledge: Responses can be validated by repetition. Permanent sampling plots with specific harvest treatments allow for participatory monitoring of harvest impact and for the development of guidelines based on that information. Doing measurements jointly leads to mutual learning, but citizen science needs to pay particular attention to variations of measurement accuracy. Methods and tools require field validation, joint methods design, or co-developed protocols to ensure there are understood and user-friendly. Conclusions: Local and traditional knowledge can assist with CITES NDFs. Informal interviews provide hypotheses, and subsequently joint validation produces reliable data that would otherwise be hard to obtain. Being reliable and building trust is key. At times, unreliable or biased information is provided (e.g. only showing bad harvesting patches). In that case, use the information, analyse it, come back after a few months and present results. That will build trust. Local knowledge is a good place to start. It provides hypotheses and can contribute data that is otherwise hard to obtain, but it needs to be backed up with evidence.	James Chamberlain interview
E: Mortality from all sources F: Management measures G: Population monitoring	Species: *Panax quinquefolius*, among many other NTFP species. Participatory approach: Communities are approached via institutions that they trust, which could include churches, first responders, or community assemblies. A key task is to understand social structure, and which institutions are most authoritative and recognized for the problem at hand. Receiving free, prior, and informed consent is a key requirement, and is a global standard, not a western concept. It entails transparency of purpose and control over how information is gathered and used. It might entail that some available information cannot be used. Further keys are integrity, honesty and respect. Transparency on pressures and requirements is usually appreciated. The integrity of the individuals engaging with the community, the perceived integrity of CITES Authorities as institutions, and of CITES as a global Convention with a common purpose are key to establish a collaboration based on trust. For full and complete collaboration and information, partnerships need to be long term; days or weeks are insufficient. Ethnographic methods are the gold standard for eliciting indigenous knowledge. Communities might have younger members with more formal education who can serve as bridge persons and trust-builders	Validation of local and traditional knowledge and conclusions: Trust-building, including long-term partnership, free, prior and open consent, honesty, integrity and respect are key to the collection of full and honest information. If done participatively, research designs, development of metrics and indicators, analysis and interpretation of results are more robust. For example, awareness of differences in plant taxonomies is key for asking the right questions and for getting a valid interpretation of the responses. Researchers should also demonstrate strong ecological and ethnographical skills, since documentation of local knowledge by pure ecologists might produce results of lesser validity. Therefore, not only the 'how' and the 'methods' are important, but also the required skills. Professional associations, such as the International Society of Ethnobiology (ISE) are well-positioned to help with such standards. Reliability can be further strengthened through triangulation, multiple sources and multiple types of sources, and comparison of local and scientific knowledge. Communities have divisions: gender, class, age, authority structures, and internal power relationships. Communities are not happy, egalitarian, or monolithic institutions. Who is an insider versus an outsider? Who is involved in harvest and distribution along the commodity chain? Where do profits accumulate? Understanding supply chain characteristics and social power dynamics and understanding who will benefit or who might be harmed ensure not only comprehensive information but are also a confidence measure. This is particularly relevant for high-volume export harvest. Scale, context and purpose matter. There may be a wealth of knowledge where species were used for several generations for subsistence purposes with high local salience. When a global market opened up, there were wholesalers who contracted	Marla Emery interview

	between scientific and indigenous knowledge and do data collection and analysis.	people, and drove them to collect in forests that were unfamiliar to them in term of terrain, ecology, and mushrooms. In such instances, collectors still have knowledge, but it has other purposes, is used in other context and scale, and thus results in other impacts. Such influences can also come from armed conflict or climate migration.	
A: Species biology & life-history B: Species range C: Population status & trends D: Threats H: Conservation status	Species: Various species, but focus is on the COSEWIC-ATK sub-committee in Canada, to which Ms. Goulet has been contributing since its initiation 20 years ago. She now serves as indigenous co-chair. Participatory approach: The initial drive of the ATK subcommittee was through the Convention on Biological Diversity (CBD). It was then mandated in the 'species at risk' act. It was developed with the Canadian congress of indigenous people. Processes were discussed at four workshops across the country. Indigenous members are appointed and funded by the government, and three PhD students work on assessment processes. There is a two-step process once COSEWIC identifies a species for assessment with two years' advance notice. ATK scopes how much local knowledge there is available, based on public information. Based on a source report and a gap analysis of existing information, a decision is made on whether ATK gathering reports are conducted. In the case of the latter, all indigenous communities are notified to inquire internally, whether they can contribute. If so, COSEWIC hires from within the community, usually through a high-level organization. Information is sent back to communities for validation (incl. possible amendments) and integrated into the COSEWIC assessment but can be held confidential. All species-specific COSEWIC committees have indigenous members who review information and identify to which sections they can contribute. They also serve as bridge people to build trust with indigenous communities. Contributions of local and traditional knowledge: There is a legal obligation to include local knowledge in COSEWIC assessments, but there are a lot of species for which no knowledge is available. For some species, e.g. endemic plants in remote areas, there simply is no other information. The COSEWIC-ATK subcommittee provides the legally mandated mechanism to access such knowledge.	Validation of local and traditional knowledge: The integration of information is often quite straightforward and not at all difficult. For several assessments, ATK contributed knowledge that was very accepted by science (e.g. relationship between salmonberry seasons and salmons populations on the west coast, and an assessment on trouts). In one instance, scientists did not accept an ATK differentiation between two kinds of shinnock salmon. Genetic work was done for validation and showed some differences, but the indigenous distinction was nevertheless rejected. An assessment of polar bears was also conflictive. Some communities perceived population increase in some places. When scientists and ATK disagree, the assessment will most likely be done with more precaution. But Inuit knowledge basically says that species go away for a while and then come back – animals move around. Scientists did not believe and found many reasons for why people reported seeing more bears. Individual people have agendas, but if many of them report similar sightings, having been out on their lands a lot, and in various communities, there is something to it. There also is a built-in validation system, since people in communities know each other and who can be trusted, and they understand that report outcomes can affect them, and they want to do it right. The chair of COSEWIC reminded members to give equal weight to both knowledge systems and the assessment came out with the conclusion that the bear was ´of special concern´ (rather than ´threatened´ which it would have been otherwise). Conclusions: Overall, one starts with a political process to ensure people have a chance to recommend how they would like to do the assessment. We started like that and it was then incorporated into an existing COSEWIC process. Financial and other support is needed. One identifies knowledge holders (individuals that have knowledge) and knowledge keepers (individuals that know how knowledge sharing works and who are the centre of a network of people who would then conduct ATK gathering) and understands how communities work with their information. It is important to provide infrastructure so that communities can maintain their own information. One ought to be respectful to spiritual connections to the species – the loss of a species is a loss for the people's future and existence.	Gloria Goulet interview

C: Population status & trends D: Threats E: Mortality from all sources F: Management measures	Species: MAPs used by nomadic tribes in coastal deserts of north-west Egypt (e.g. *Panicum turgidum*, *Urginea maritima,* and *Colchicum* spp.). Participatory approach: Once fieldwork started, people got curious and asked what we were doing. From there, we got to know more people through fieldwork (snowball sampling). We talked to different types of people (knowledge holders, healers, herbalists, collectors, elders (men and women), herd keepers who collect plants while keeping herbs), but questionnaires were done informally, since people do not accept formal interviews. Where we could, we met heads of families or tribes. Contributions of local and traditional knowledge: Questions included whether habitats were shrinking, drivers of decline, enrichment planting, and collection activities.	Validation of local and traditional knowledge: One needs to ask people whether they would be able to help. Informal interviews and snowball sampling work best. To enhance accuracy and understanding, it helps to ask more than once in different ways, in non-direct ways, in a chatting way to get the answer validated. One should ask more than one person and distribute questions between men and women - they have their own tasks and specialised knowledge. The older the person, the more information they have. Conclusions: Collaboration should be of benefit to both sides. It will work better if it is positively impacting people's lives, especially if outcomes might require behavioural change. There should be something communities understand and benefit from. Therefore, conservation should be connected to livelihoods and innovative ways to ensure the plants' sustainable use, such as access of certified products to larger markets. Communities need to understand it is not about stopping their practice, but about being in international supply chains.	Marwa Halmy interview
F: Management measures	Case study species: MAPs and NTFPs in Madagascar, Mozambique, and Peru. Participatory approach: Research was carried out in collaboration with local NGOs that had long-term relations with communities. The research was introduced at community assemblies, where formal authorization was given. There were always some products or booklets to give results back to the community. Collaborators were herbalists, local herbariums, laypeople with plant knowledge and communities at large. Methods included questionnaires, sample collection, participatory tools like community workshops, focus groups, group discussions, group ranking evaluations, in addition to in-depth interviews and walks. Joint learning is usually a long process and requires good facilitation skills from researchers. An example of a tool for joint learning is the agro-ecological knowledge toolkit (University of Bangor) software to codify and document local ecological knowledge. Contributions of local and traditional knowledge: We analyzed management practices and elaborated recommendations to come up with agroforestry options that are based on local knowledge and local perceptions of needs and benefits.	Conclusions: Including experiential knowledge is extremely useful, since it is often very rich, even in areas where there is not much literature. Some experiential knowledge is more cultural, spiritual, or relates to worldviews, norms and social organization. Experiential knowledge cannot simply be taken out of context. But practical knowledge is rather similar all around the world. Methods and tools are transferable and should be applicable in any context. Choices depend a lot on how much time can be invested. When time is limited, it is best to do a more participatory rapid assessment; when there is more time, ethnographic and in-depth fieldwork can be used. Work with local experts can be quicker than with the general population. But expert knowledge may not be representative of the knowledge of women or other societal groups. Ethical aspects are important - how to engage with local knowledge, legal requirements, and research ethics. The International Society of Ethnobiology has an elaborated ethics code.	Sarah-lan Mathez Stiefel
E: Mortality from all sources	Species: Wild MAPs in Germany and Eastern Europe, including *Arnika* spp., *Primula* spp., *Euphrasia* spp. and *Crataegus* spp. Participatory approach: Dialogues included NGOs and local biodiversity experts or biodiversity amateurs.	Validation of local and traditional knowledge: Due to the lack of evidence-based knowledge of collectors and harvesters, it makes only limited sense to work with their qualitative judgements. Conclusions: Working with traditional knowledge in wild collection is challenging. There is no corporate social responsibility or sustainability management in large commercial MAP supply chains, and various factors lead to supply chain problems	Rainer Luick interview

	Contributions of local and traditional knowledge: In Germany, there are some professional collectors with limited plant knowledge. In Eastern Europe, harvesters and collectors are not experts, with very little empirical knowledge. They are precarious day laborers, transported to harvest areas they do not know, who are shown plant pictures and collect anything looking remotely similar to those.	(climate change, socio-economic change, land use chains, and others). Quality is decreasing and there are fights for claims – resources are kept secret. Therefore, artificial propagation is thriving.	
B: Species range C: Population status & trends E: Mortality from all sources F: Management measures G: Population monitoring	Species: Wild MAPs in Germany and Eastern Europe, including *Arnica montana*. Participatory approach: Contacts were established through snowball sampling, sometimes initiated through pre-existing established contacts. They include local farmers with grassland properties, local collectors, local traders, national park employees, and companies. Both informal and semi-structured interviews are used, with some more structured questions. Contributions of local and traditional knowledge: Questions focused on which species and plant parts are collected, their identification, range and habitat, collection methods, quantities and seasons, and changes in the population over time. Questions to national park employees and traders also focused on trade controls and supply chain characteristics.	Validation of local and traditional knowledge: Knowledge is reliable if cross-checked with different people since this indicates that it is real community knowledge. If it has been learnt from other generations, then it is likely to have been there for a while and is not only an opinion., Identification, pictures and visual stimuli are used to aid elderly people who cannot go anymore on field walks. Language issues can be challenging. Researchers can be perceived as strangers. Local communities can consider nature protection regulations as limitations and that research could lead to additional regulatory burden. Sensitive economical aspects might make informants hesitate to be completely honest. Contact should not be stressful and take place in an atmosphere of trust. It helps to have a long relationship with community representatives. Group discussions or asking various people are best and help identify repetitive information. Transparency, dialogue on an equal footing, meetings and plenary discussions with neutral moderators are important. Conclusions: Local knowledge also exists in Europe. It is less common, and elderly people with more special knowledge are also dying out, but even here we have it. Knowledge is heritage. One should consider the rewards for using their knowledge. Partners should have the feeling to be empowered and to have influence, not controlled and voiceless.	Joanna Sucholas and Anja zur Loye interview
E: Mortality from all sources F: Management measures G: Population monitoring	Species: *Panax quinquefolius, Allium tricoccum, Hydrastis canadensis* and other native MAP and NTFP species in Madagascar, Nicaragua and the United States of America. Participatory approach: People might be intimidated by academic scientists; it is important to tear down walls. It is all about relations and starts with learning. It is key to get out there, meet harvesters, growers, and to offer educational events, workshops, or forest walk, not behaving as an expert, but as an apprentice in local knowledge. Internationally, snowball sampling works. As relationships deepen, one can educate stakeholders on what is going on and on how big and international this trade is; start mechanisms for conservation and pathways to adopt responsible behaviors; strengthen what works well; address knowledge deficiencies and behaviors; analyse gaps; how to adjust language in regulation; and understand how to strategically use information. There is reticence towards cooperation if	Validation of local and traditional knowledge: - It is important to understand what people know and do not know, and why they act as they do; and to learn to ask the right questions. A lot of people not trained in social sciences could go out and engage in very arrogant ways, not thinking about how they come across. They should listen first before standing up with a presentation. - Interviews and meetings can shed light on reasons for misreporting. These reasons may include intentional acts ('reporting as wild-sourced enhances prices', 'keep good sourcing areas secret from competitors', 'fear to be taxed once artificially propagated resources are classified as crops'), but also differences in concepts, vocabulary, and understanding, sometimes even superstition. - Certification can improve evidence and reporting by encouraging the establishment of a paperwork trail. Conclusions: Overall, regulation tends to leave proactive stuff behind and go to the reactive side of things. Not everybody acts in the best interest of the resource. One has to engage to get more buy-in and check on what is going to work or not and to understand correct reporting categories. Therefore, a framework is needed to identify	Eric Burkhart interview

	imposed, but willingness to participate in conservation programmes that engage people as partners. Contributions of local and traditional knowledge: Joint fieldwork can engage communities for mapping their territories, including boundaries of cultural sites and natural resource extraction areas, including for NDFs. The United States of America is attempting to set up a citizen science platform for reporting information, a national phenology network.	who should be involved; to make sure to ask the right questions; and to involve both top-down and bottom-up mechanisms. How researchers engage is important. Some stakeholders do not want friends and family to "give away" knowledge. How to gently correct is important. We should think about it creatively and passionately. Traders are often considered the best information sources, since they buy the material.	
A: Species biology & life-history B: Species range C: Population status & trends D: Threats E: Mortality from all sources F: Management measures G: Population monitoring H: Conservation status	Species: NTFPs in Cameroon, including *Prunus africana*. Participatory approach: Contacts started through field botanists from a botanical garden and proceeded quite organically and informally, via traditional leaders, and by going from house to house in communities, and also with community meetings at large. There is a need for constant dialogue and clarity about benefits. There were community research agreements to define what knowledge is used and what for, since they do not want to share much information on MAPs. Conversations can be very superficial for a long time, and they can collapse due to a few individuals. For twenty years, methods included local field researchers independently implementing research protocols, but the instruments need to be straight and clear. Contributions of local and traditional knowledge: The more communities use locally a species, the more they understand the relationships between species, where they grow, habitats, management, ecological roles, interspecies relations, even microorganisms. Research questions addressed uses (spiritual, building, food, medicine, etc.) and species management (how people use different habitats, differences between communities, indigenous vs. migrant communities and between different groups in the communities).	Validation of local and traditional knowledge: It is best to start with understanding local management strategies and to start a consultation process to explain what, why and how. It is often not obvious how it works, not like 'seeing a field with the species'. One should hire people who have already done that, wildlife experts with local expertise, and use a team approach, with initial pilot research and community consultations. One needs two sets of expertise: ethno/community/local, and sustainability expertise. There may be many cultural sensitivities. Initially, it takes a year to get information that is remotely of interest. The information gets better over five years. Conclusions: It takes a long time to build relationships and get proper consent, and to understand traditional knowledge. It is easy to look at only one species, but traditional medicine systems are incredible complex and manage hundreds of species at a time. To access that complexity of knowledge is not easy, and to get the most interesting knowledge is really hard. People will not always tell, not only because of hiding, but also because they do not understand what researchers want, because of different taxonomies, and because they will not take just any specimen - they may have one single tree in a particular place that they know. The shortcut is to work with people in the communities, to get the right team with local skills, but even with that it remains challenging. In Cameroon, there are lots of tensions between communities and the State. *Prunus africana* is overharvested, but it is of not much use in local medicine, and is only one among many NTFPs, and not a critical one locally. A lot of overharvesting is through outside people, not the locals.	Sarah Laird interview
A: Species biology & life-history B: Species range C: Population status & trends D: Threats	Species: Highly traded MAPs and NTFPs in Bhutan, Indonesia, Micronesia (Federated States of) and the United States of America, including Kava (*Piper methysticum*), and *Sabal palmetto*. Participatory approach: Government databases were used to identify landowners. On excursions, local students that take part in teaching activities might know relatives who collect, and who can be asked for information. Once there are first contacts, the snowball system works to identify buyers, middlemen, traders, companies. Immigrants tend to be	Validation of local and traditional knowledge: There are multiple strategies to ensure truthfulness and reliability of information: - To verify information in several different ways, and mixed methods approaches. If someone talks about money they make, ask middlemen or companies what they pay. Habitats can be participatively mapped in GIS to see where populations should be. This information can be verified in the field, to see whether they talk about the right habitats. If there is a drought according to satellite information and informants do not report that populations have been affected, they do not tell the truth.	Christine Mitchell interview

F: Management measures G: Population monitoring H: Conservation status	cautious and current generations are less interested. Even the pharmaceutical industry does not find enough collectors and hires more and more Roma people and immigrants, but they have no relevant knowledge. Local people conducting fieldwork or implementing assessment, monitoring or management protocols is complicated. If authorities preselect people, you may not control the selection criteria. Whether it works and you receive unbiased information depends of people's motivation. Jointly designing assessment, monitoring or management protocols are absolutely useful and can be learnt by trial and error, asking informants for better ways to ask questions. Methods can be qualitative and quantitative. One can start with open-ended questions, then semi-structured interviews, and then a survey. Focus groups may not work, since topics can be sensitive to the industry because species are protected or because participants fear competition. Contributions of local and traditional knowledge: Knowledge may include conservation status, trends, and concerns, intrinsic biological risk, vulnerability, regeneration, which parts to harvest to allow regeneration, or impact of major disasters, plant populations and trends, artificial propagation, and uses.	- One can partner with local institutions and develop reliable resources in a long-term relationship, as part of a long-term development of trusted sources from middlemen and industry. - One should make the relevance of the work understood and highlight its financial and other benefits to the community. Conclusions: People do not like to share information outside of their personal trust circle. It is thus crucial to find entry into the community, understand whether activities are legal, and design studies accordingly. If there are language challenges, it is necessary to use interpreters. One needs the right people and the right funding. Overall, it is important to understand the historical context of the place, to put aside judgement and to adapt the research to the context as one goes along. Culturally pertinent communication and becoming an expert on the region is key.	

Summary of literature case studies on using local and traditional knowledge in species assessments, and of participatory monitoring and management

Addressed considerations [Res. Conf. 16.7 (Rev. CoP17) Para. 1 a) ix)]	Methods used in case studies to collect local and traditional knowledge	Methods used in case studies to validate local and traditional knowledge and conclusions	Source
C: Population status & trends G: Population monitoring H: Conservation status	Species: 6 MAP taxa, including *Orchis* spp. in Albania. Participatory approach: Participative resource assessments along with four groups of eight key informants, who represent the currently most active and experienced harvesters for each species. Contributions of local and traditional knowledge: Locally used assessment indicators were elicited with semi-structured interviews. 45-73 plots per species along random transects in areas in which the species were perceived as 'rare' or 'common' were assessed against local indicators. Harvesters used between 6 and 25 indicators per taxon including: - Population status by area (areas in which species are perceived by harvesters to be 'rare', 'locally abundant' or 'common'). - Population status and harvest-related aspects by sampling plot (presence-absence, density, age classes, harvest signs, habitat, vegetation community, soil characteristics). - Population trends ('decreasing', 'stable', 'increasing') during three periods of time: before 1990, 1990-2010, 2011-2015.	Validation of local and traditional knowledge: Harvesters were shown pictures of assessed species to ensure correct identification. For each species, 20 plots along transects in areas in which the species was 'common', and 'rare' were jointly assessed by harvesters and scientists. Reliability of each statement was assessed against five binary criteria of the reliability index developed by Ziembicki et al. (2013): - informant correctly identified species; - informant was an active harvester at the time of the research; - informant was an active harvester under communism; - informant' statements were confirmed by other informants; and - informant was a recognised knowledge holder by other harvesters. Conclusions: Local and scientific assessments mostly matched, in particular when ordinal (ranking) scales were used, for common, culturally and economically significant species, and in areas in which such species are 'rare'. Harvesters detect signs of previous harvests better than scientists. Mental models of harvesters refer to harvestable material and tend to holistically integrate observations from extended time spans or areas, while scientists refer to the totality of specimens of a species in a particular plot or area at a given time. Harvester's indicators tend to be fuzzy, overlapping and complementary, distinguishing quantitative ranges perceived to be 'normal' vs. 'outliers'. Scientists use fewer, more concise indicators, but cannot easily contextualize observations.	Tomasini, Theilade (2019)
C: Population status & trends H: Conservation status	Species: Forest taxa (4 mammals, 3 birds, 3 plants) in Nicaragua. Participatory approach: Two communities were contacted through a civil society organization, and the survey was approved by their general assemblies. Scientists and community members agreed on the taxa important to the communities. The survey was co-designed in participative planning workshops. Two focus groups of 10-20 harvesters, hunters, loggers, and local park rangers were established, each facilitated by non-indigenous park rangers. Information provided by the community members was discussed in indigenous language. Focus group validation involved time, commitment, and underlying trust. Community members were in control of the process -	Validation of local and traditional knowledge: Focus group assessments were validated by line transect walks in nine sites. Scientists and community members (selected by village leaders based on their interest and experience with hunting and collecting forest products) recorded taxa signs and sightings over 2 hours along predetermined 2 km transects, once every 3 months. Scientists and community members kept similar walking speeds and starting times along the same routes, but on different days. Persons involved in transect walks were not involved in focus groups. Conclusions: Scientists and locals observed similar numbers of most taxa, especially birds and plants, with a tendency for community members to observe higher numbers. According to transect line data, focus group discussions were precise in distinguishing taxa with 'many individuals' from other categories but could not distinguish between categories 2-4. The definition of 'many' used by focus groups varied by taxon – focus group discussions integrated expectations of species' natural density. Line transect assessments incurred costs eight times higher than focus groups. The study recommended to:	Danielsen et al. (2014)

	agreeing what was right and wrong. From 2007-2009, focus group meeting took place every three months to discuss the abundance of each taxon. Contributions of local and traditional knowledge: Abundance estimates in the following categories: (1) "Many individuals": more than 10 individuals were recorded in 4 hours of forest walks; (2) "Some individuals": 1–9 individuals were recorded in 4 hours of forest walks; (3) "Few individuals": More than 4 hours of forest walks are required to record one individual, but the taxon is recorded more than four times during the 3-month period; and (4) "Very few individuals (or none)": The taxon is recorded less than four times during the 3-month period.	1. establish independent focus groups in multiple communities that know resource abundance in the same geographical area (triangulation across communities); 2. convene regularly village meetings to present and discuss data and interpretation and obtain feedback from the community (triangulation across community members); 3. facilitate the collection of auxiliary data through, e.g., community members' direct counts of resources in the same area (triangulation across methods); 4. include individuals within the focus groups who are directly involved with using and observing natural resources (thereby increasing the number of primary data providers); 5. use unequivocal categories for resource abundance; and 6. ensure that the moderator of the focus group discussions has skills and experience in facilitating dialogues.	
A: Species biology & life-history C: Population status & trends D: Threats E: Mortality from all sources H: Conservation status	Species: Mistletoe-infected trees in southern India. Participatory approach: The study collects local knowledge of 47 tribal harvesters from 16 out of 57 villages located in a forest sanctuary. Harvester had 10-30 years of harvest experience and were selected based on peer recognition. All respondents were interviewed in the local language by a local research assistant, who was well trusted by harvesters to the point that they would also share practices which they knew were prohibited by the forest department. Contributions of local and traditional knowledge: Species ecology and management, population trends, ecological relations between trees and mistletoe parasites, reproduction, and threats. Local and traditional knowledge also contributed information on current and past (between 1990 and 2015) harvesting activities: average yield per day, number of harvest days, and standard rate earned per unit collected. The perceived total amount collected per season for each harvester was calculated based on the number of days spent harvesting multiplied by the individual daily collection amount.	Validation of local and traditional knowledge: Interview responses were compared with ecological data from field studies. Accuracy of recalled harvest quantities during a 15-year period was inferred indirectly, by comparing their recalled yields per unit to official price records. Conclusions: In general, data from ecological studies and local knowledge matched well. Local knowledge provided information more efficiently (in terms of data collection effort expended by scientists) and of equivalent or higher accuracy than conventional ecological studies. For example, phenological studies required 288 man hours over a 12 month period, while social science methods for gathering closely matching harvester information took approximately 70.5 hours. For some rare events, for example rare mistletoe associations or uncommon dispersal mechanisms, local knowledge provided insight which a survey of 60 forest plots was not able detect. Authors emphasise that scientific studies may offer precise measurement but can be narrow in focus and expensive to implement. Local knowledge may compromise on accuracy for some variables but may be inexpensive and draw on larger temporal or spatial sample sizes. Trade-offs between information accuracy, precision and available resources make rapid surveys of local knowledge valuable information sources.	Rist et al. (2010).
C: Population status & trends	Species: Four arctic bird species in Canada. Participatory approach: Knowledge is gathered through structured interviews, and meta-analysis of previously recorded local and traditional knowledge. Contributions of local and traditional knowledge: Comparison of local and scientific knowledge regarding population status and population trends.	Validation of local and traditional knowledge: Local knowledge is compared to scientific data on population status and trends of the species. Good degrees of coherence between the sources of knowledge are observed for three out of four species. Conclusions: Reliability depends the relationship of the species in question to the local community. Quality is higher for species with which local peoples had greater familiarity through harvest or year-round contact. Since the accuracy of knowledge varies, an adequate sample size of individuals must be questioned to increase confidence in the	Gilchrist et al. (2005)

		information. Quantitative information may be available for the distribution of species, but lacks the necessary detail for tracking population change, except for catastrophic declines.	
A: Species biology & life-history C: Population status & trends D: Threats H: Conservation status	Species: Trout populations in 3 remote Canadian rivers at 200km distance from next settlements. Participatory approach: Longitudinal study (2000-2002 and 2011). Local fishermen were selected with the indigenous trapper's association. Traditional knowledge was accessed in consultative meetings of 2-9 participants, and 14 semi-directed interviews. Contributions of local and traditional knowledge: Spatiotemporal distribution, trends over 11 years, and conservation concerns. For two rivers, local knowledge suggested stable spatial distribution and stable population trends. In one river, stable or slightly decreasing overall population trends were observed, but populations reportedly show higher mobility, and are caught in places where they did not previously appear. In all three rivers, trout arrival in rivers had shifted to later periods of fall. Identified population pressures were intense fishing, and climate change. Respondents were almost unequivocal about most responses.	Validation of local and traditional knowledge: Degree of consistence of responses between 14 local experts in three locations allows to distinguish common perceptions and outliers. Traditional knowledge was complemented with an array of scientific studies, including experimental analysis of catch per unit effort, life-history characteristics, genetic and genomic diversity, and breeding numbers in populations. Conclusions: Scientific studies confirmed local knowledge in every aspect. Declining population trends in one river are statistically inconclusive and might not have been noticed without local knowledge. Scientific research additionally detected that trout length-at-age had reduced within the 11-year time span. Authors recommend pluralistic monitoring approaches for scientific, pragmatic, and financial reasons. Yet, pluralistic studies need to be carefully interpreted, especially if there is some overlap in the samples used for each individual line of evidence. If multiple interpretations of results derive from the same biased sample, then one becomes more confident in a biased result. A trade-off exists between increasing the number of metrics adopted and ensuring reliable sample sizes. While not the case in the present study, inconsistent results of multiple data types remain possible. Yet, such inconsistency among data types may reflect true uncertainty in the biological system.	Fraser et al. (2013)
C: Population status & trends	Species: Multiple plant and animal species in two Mexican communities. Participatory approach: Evaluation of rapid rural appraisal and participatory rural appraisal tools, including semi-structured interviews, transect walks and participatory mapping. Contributions of local and traditional knowledge: Detection of biodiversity trends. Between 60% and 96% of useful plants and animal species were considered to have declined within living memory. These declines appear to result from overutilization as well as habitat changes.	Validation of local and traditional knowledge: Authors indirectly assess reliability and accuracy of local knowledge by evaluating indigenous knowledge on patterns of change in vegetation type with remote sensing imagery and GIS tools. Conclusions: Rapid surveys of indigenous knowledge may inform about trends in biodiversity, including changes in abundance of particular species and dynamics of vegetation types. This approach requires to ensure that remote sensing and local knowledge refer to the same spatial and temporal scales and use similar classifications of vegetation and land-use types and might otherwise lead to seemingly contradictory information.	Hellier et al. (1999).
C: Population status & trends E: Mortality from all sources G: Population monitoring	Species: Crayfish and 4 categories of firewood (*Eucalyptus* spp., *Psidium cattleianum, Harungana madagascariensis*, mixtures of undefined forest species) in a community in Madagascar. Participatory approach: A year-long study (2004-2005) and rapid assessment interviews with the same informants. 22 households were regularly interviewed in three-weeks-cycles for their daily resource collection. Informants were asked about the location and nature of each household member's activities that day. Crayfish and firewood	Validation of local and traditional knowledge: Accuracy of rapid (annual) semi-structured interviews was assessed through cumulative harvests elicited during regular interviews of daily harvest. The probability of detecting a change in harvesting behaviour from interview responses was statistically estimated. Conclusions: Interviews provided reliable information on quantities, effort, and the spatial pattern of harvesting, i.e. rapid interviews would detect changes in catches and harvesting effort with sufficient accuracy to allow monitoring of changes in harvester behaviour. Accuracy is higher when the same informants are questioned in repeated interviews. There is a tendency to report closer to the mean of all informants than true personal value, that	Jones et al. (2008).

	collected were brought to the interview, the number of crayfish counted, and the species and number of firewood bundles recorded. At the end of the study period each household was privately interviewed for overall list of sites they had collected from, and the amount collected per site, distinguished by three locally appropriate seasons. Contributions of local and traditional knowledge: Harvest quantity, timing and spatial collection patterns.	is, informants at the lower range of the population tended to overestimate and those at the higher end tended to underestimate. To yield quantitative information useful for detecting trends, questions must be formulated that respondents can answer accurately. Focusing questions on activities which respondents are likely to remember may make results more reliable. If informants have reasons to under- or over-report activities, results will be biased; thus, possible incentives faced by informants should always be considered. One of the most significant influences on the validity of responses is the perceived attitude of the researcher to harvesting, and researchers must make every attempt to appear neutral.	
C: Population status & trends G: Population monitoring	Species: Ten large-bodied vertebrate species around 161 statistically selected riverine settlements (household size between 1 and 281) located along 7 rivers species in the Brazilian Amazon. Participatory approach: Rapid interview surveys in 2007. In each settlement, all available hunters were asked for the nearest locations in which they had encountered direct or indirect evidence of each species within the last 12 months. Well-known inhabitants of each river assisted as guides and to establish contacts. Research objectives were discussed with hunters and community members prior to interviews and researchers identified themselves as independent of any governmental organization. Contributions of local and traditional knowledge: Estimation of landscape-scale depletion.	Validation of local and traditional knowledge: The plausibility of statements was assessed using triangulation, such as between recall of offtake and distances to nearest observed locations, as well as between statements of different informants. Multiple human settlement and landscape variables were statistically tested with regard to their power to predict the size of observed depletion zones around settlements (including human population density, settlement characteristics, distance to the primary forest, upland terra firme coverage, distance to the nearest urban centre). With these statistical relations, depletion zones for the entire state of Amazonia were modelled. Conclusions: Four species were heavily depleted and had highly predictable responses to both settlement and landscape drivers. The study demonstrates that local knowledge, combined with quantitative data provides a cost-effective way to monitor the depletion of forest wildlife over large spatial scales, ideal for resource-limited and spatially extensive tropical contexts.	Parry and Perez (2015).
A: Species biology & life-history C: Population status & trends F: Management measures	Species: *Warburgia salutaris* (pepper trees) in Southern Mozambique. Participatory approach: Stratified random, semi-structured interviews with 182 informants in 13 villages in three study areas, complemented by 17 focus groups with 5 to 7 key informants, identified by local leaders to explore in-depth knowledge. Contributions of local and traditional knowledge: Local management practices, species ecology, and past, present and expected trends in local abundance and status.	Validation of local and traditional knowledge: Information from interviews and focus groups were triangulated. Conclusions: Two-thirds of respondents could identify harvesting approaches that result in significant damage to plants. Respondents mentioned 17 characteristics that described favored habitats of *W. salutaris*. Very few respondents had knowledge of the flowering time of *W. salutaris* or pollinators. More than half of the respondents stated that the abundance of *W. salutaris* had declined in their areas. Four drivers were identified including bark trade, cutting for charcoal production, wildfires, and opening up land for construction. Respondents felt that the abundance was likely to decrease in the future, largely as a consequence of the bark trade.	Senkoro et al. (2019).
A: Species biology & life-history C: Population status & trends D: Threats	Species: *Caryocar coriaceum*, an important NTFP in protected national forest communities in Brazil. Participatory approach: 61 informants in three communities were interviewed. Selection was by snowball sampling to access the knowledge of collectors that are recognized by their peers.	Conclusions: Frequency of references to indicators, and ecological understanding expressed in judgments of their severity allow to detect instances of strong ecological understanding. Local indicators perceived as higher risks express a holistic view of factors that influence the sustainability of the species. The authors suggest that the local knowledge of extractive populations has the potential to directly contribute with local monitoring processes. In addition, local knowledge can contribute to reduce social-environmental conflicts between resource users and protected	Sobral et al. (2017).

	Contributions of local and traditional knowledge: Local indicators to monitor conservation status, the frequency indicators were mentioned, and the severity of conservation risks they were perceived to indicate. Communities mentioned between 19 and 35 indicators relating to species management, population structure, climate, environment, ecology, and phenology.	area managers, and their observations may constitute new hypotheses for future ecological studies.	
A: Species biology & life-history B: Species range C: Population status & trends E: Mortality from all sources	Case study species: Yangtze finless porpoise (*Neophocaena asiaeorientalis*) in China. Participatory approach: Informants were identified with assistance of community leaders in 27 fishing settlements distributed approximately evenly along the species' entire recent geographical range. Of an estimated total of 1677 fishing vessels, 599 fishers were interviewed by a native Chinese speaker, who followed a questionnaire containing descriptive, structured and contrast questions. Project staff remained neutral during interviews and avoided leading questions. The protocols were field tested to improve clarity of questions and to train interviewers. Concerted attempts were made to ensure that responses were standardized and quantifiable. Particular care was taken to encourage informants to report all known porpoise mortality events, by asking for details about total numbers of dead porpoises they had seen and also about porpoise deaths associated with anthropogenic factors. Contributions of local and traditional knowledge: A spatiotemporal population status assessment of relative spatial abundance and decline. Informants were asked about porpoise sighting frequency, group size and seasonality; perceptions about porpoise decline; their reaction to by-catch events; regional use of rolling hooks and electro-fishing; detailed information about all past sightings of dead porpoises, including date, location, and cause of death if known; and how many hours/day and days/week they typically spent fishing.	Validation of local and traditional knowledge: While not strictly necessary for this iconic species, photographs of wild and captive life specimens were shown to ensure correct identification. Careful in-depth questioning allowed to distinguish responses based on empirical observations (e.g. mortality from observed wounds inflicted by fishing gear and vessel strikes), and indirect hypothetical inferences (e.g. instances of porpoise mortality attributed to general environmental pollution). Representativeness of the sampled ecological experiences was ensured through a large number of informants with varied socio-cultural characteristics and fishing practices, and by excluding from the analysis river sections with few responses. Some information (e.g. excessively large reported group sizes) were considered scientifically implausible and thus excluded. A wide variety of hypotheses relating to spatial and temporal variations among the remaining responses were statistically tested. To validate temporal trends and relative significance of threats, mortality data from interviews were grouped into two decade-long intervals that roughly correspond to independent abundance surveys. Conclusions: Authors suggest that the cumulative experience of informants spending a considerable proportion of their lives on the water may sometimes provide more comprehensive information than is obtainable from short-term surveys. Compared to scientific surveys, interview data added timelines of population dynamics spanning two decades, evidence of seasonal upstream–downstream movements, possibly in response to annual water cycles, and of at least periodical porpoise populations in river sections previously considered depleted. Authors suggest that survey techniques can be labour- and cost-intensive, placing restrictions on survey regularity and limiting the ability to detect population trends. In contrast, community interviews represent a relatively inexpensive approach for collecting data across wide geographical areas and can provide both historical and current information. While local knowledge was very informative for understanding patterns and trends in porpoise abundance and status, the identification of threats may be prone to biases, since fishermen cannot unambiguously distinguish some causes of mortality.	Turvey et al. (2013).
A: Species biology & life-history B: Species range C: Population status & trends	Case study species: 51 mammal species across Australia's northern territories. Participatory approach: Interview protocols, including the selection of appropriate elders and other interview participants (chosen on the basis of in-depth traditional knowledge or continued hunting practice and connections with the land), were developed in consultation with indigenous representative groups, local indigenous	Validation of local and traditional knowledge: A collection of mounted mammal skins in life-like postures was used to help facilitate discussions and verify identifications. Further identification aids were books containing photographs of all species and, in some instances, live specimens. Due to changes in local lifestyle away from subsistence hunting, and inherent susceptibilities to fading memories, mistakes and biases, a system to assess reliability is elaborated. Each record was scored with regard to whether the informant correctly identified species or its local name; was resident, or otherwise familiar with the specific location; statements were confirmed by other informants and/or with scientific or historical data; and whether the participant's overall knowledge was reliable. The database	Ziembicki et al. (2013).

G: Population monitoring	rangers, and ethnologists. In total, 55 semi-structured interviews with open-ended questions were held at 32 locations with 134 participants (aged 25-80) between 2005 and 2009. Records were obtained for 213 localities. Interpreters were used in areas where local languages are still spoken. Contributions of local and traditional knowledge: For each species, interviews addressed local names; species' ecology (i.e. habitat, shelter, diet, breeding biology, behaviour); uses; and the locations the species is or was found in three general time periods: in the past when the participant was a young man or woman, in the recent past, and the current status. For each period, participants were asked to indicate whether the species was common (many individuals seen often), present in low numbers (some seen occasionally) or absent.	thus comprised a set of records, each including participant name, time period, abundance category, species, reliability score and location. Only records of medium and high reliability were used; other records were omitted. The database was statistically analysed, with average scores for each species, period and region combination, and graphically displayed. Conclusions: For common species still hunted, there was no historical trend in the reliability of records, but for many smaller or no longer hunted species, there was a clearly decreasing reliability trend, or participants were unable to give clear information. Overall, reliability declined across the three time periods. Results support previous, numerically precise, but localised and short-term monitoring studies and complement it with a broad geographic scope and longer time frame. Scientific thinking and local knowledge differ regarding the spatial and temporal progression of mammal decline from interior to more coastal areas. The authors suggest that declines in the lower rainfall areas may have preceded the memory span of informants, with some species disappearing from these regions more than 50 years ago.	

Synthesis and lessons learned from 40 case studies involving local and traditional knowledge, and participatory methods for assessments, monitoring and management of CITES-listed MAPs

Benefits of using local and traditional knowledge in species assessments, and of participatory monitoring and management of CITES-listed MAPs: Local and traditional knowledge may in certain cases improve scientific assessments through very detailed and comprehensive information. It is usually location specific and can thus complement global scientific knowledge with local details. It is often holistic and contextual and may thus shed light on aspects that are complementary to scientific analyses, such as complex societal or ecosystem relations, or drivers of change. It frequently spans longer time frames and may thus add longer term perspectives to short scientific data series. It may be the only available source of knowledge for species with very little scientific information, in particular species of high cultural salience and recognizable appearance, but geographically restricted range. Local and traditional knowledge is usually acquired through purposeful utilization of a species. Therefore, it tends to be most detailed and reliable for considerations that are relevant to its use. In many cases, the best local knowledge of a species may be acquired by individuals that are keen observers and have a long-standing personal experience of its use. Where existing, local knowledge may also be acquired through thorough education by traditional experts with high local reputation (plant healers, sages, elders, leaders of traditional collector or trade networks).

Involving local and traditional knowledge and participative species monitoring and management can enhance species conservation. Involving local and traditional community members in monitoring and management can ensure that crucial information (e.g. about local species populations) is included and may contribute valuable recommendations based on local perspectives. It also increases the validity and legitimacy of assessments, monitoring and management from a community perspective, enhances community buy-in, and may strengthen its adherence to and collaboration in conservation efforts. Building on local resources and empowering local capacity can support the long-term autonomy of conservation efforts and the sustainability of their impacts. Overall, conservation efficiency and effectiveness may be enhanced.

Involving local and traditional knowledge and participative species monitoring and management can enhance community livelihoods, which may be generated from the long-term conservation of the utilized resource base, from enhanced local capacity, and from direct benefits through participative monitoring and management programmes. If well explained and maintained over time, these benefits can in turn enhance information provision and collaboration in monitoring and management by local communities.

Challenges of using local and traditional knowledge in species assessments, and of participatory monitoring and management of CITES-listed MAPs: Accession to local and traditional knowledge requires planning and time investment. It is crucial to address communities respectfully, to explain transparently the purpose of collaboration, possible benefits to local livelihoods, and to receive free, prior, and informed consent on all aspects of collaboration and knowledge utilization. To ensure community support, respected community leaders (elders, mayors, government representatives, religious or clerical leaders, or reputed and well-connected individuals) should be contacted first. They will enhance legitimacy, and frequently be able to facilitate contact with knowledge holders, who can in return recommend others (snowball sampling). In many cases, their knowledge of community members is influenced by their geographic context and their societal roles and positions. Ideally, there should thus be numerous informants that represent geographic and cultural diversity. To collect tacit knowledge, interactive methods that trigger a variety of inputs may be appropriate, such as landscape walks or group discussions. The longer good relations are maintained, the more likely it is to build trust and to receive access to full and undistorted local and traditional knowledge.

The utilization of local and traditional knowledge is not always straightforward. Botanical and local or traditional taxonomies are not usually identical, which is why emphasis should be put to clarify the species in question, for example through pictures, or joint identification in the field or in gardens, where available. Local and traditional knowledge is almost always qualitative and might be inconsistent between different local and traditional sources, or with scientific information. As any other knowledge, it may also be biased, or in some cases even purposefully incomplete or misleading. Semi-quantitative weighting of information, and assessments of information quality are possible through the best possible selection of sources, observing their reliability and motivations for collaboration, and the frequency of similar information among informants. Likewise, careful interviewing, ranking exercises, triangulation of methods, or partial validation through scientific knowledge or field observations are useful tools. Some disagreements may derive from local or traditional assumptions, terminologies and explanations that may seem unfamiliar or even implausible to scientific investigators. Reflection, and where required, additional dialogue can serve to distinguish key empirical content, cultural explanations that may be deemed less relevant to conservation science, and those explanations that may be considered additional, valuable perspectives. To ensure information quality, reduce misunderstandings, build trust, and enhance local ownership, results and conclusions should be presented to, and validated with the communities from which knowledge was gathered.

Managing participative processes in species monitoring and management is a challenging task that may frequently require intercultural skills and commitment. Where feasible, it would greatly benefit from institutional arrangements that can maintain long-term community relationships, and staff with dedicated training, for example in anthropology, ethnobotany, or

community-based participative work. It is often observed that trust-building and collaboration greatly benefits from 'bridge-persons': individuals with a personal, long-standing background and trustworthy reputation in both scientific or governmental and local communities.

Methods to obtain relevant local and traditional knowledge that can inform the making of NDFs for CITES-listed MAPs:

i) Case studies and expert interviews emphasize the importance of building trustful relationships between communities and researchers. Key features widely referred to are: (i) transparency regarding the objectives of the research (reported by Abdon Awono and many others); (ii) obtaining free, prior, and informed consent from communities and informants (reported by Marla Emery, among others); (iii) ensuring that collaboration provides tangible benefits for the community (including livelihood benefits, reported by Marwa Halmy and others); and (iv) try to establish long-term collaboration, which is reported to build trust and improve quality of collected knowledge over time. In the context of NDFs, this could be realized in repeated or annual joint quota setting, which are exemplified by various NDFs for mammals and other hunting trophies available in the NDF database on the CITES website. But case studies indicate that useful knowledge can also be obtained from short assessments (e.g. Parry and Perez 2015, Jones et al. 2008, Hellier et al. 1999).

ii) The Canadian '*Committee on the status of endangered wildlife's aboriginal traditional knowledge sub-committee*' (COSEWIC-ATK) provides an institutional model that combines long-term engagement with relatively short-term individual species assessments. It was jointly developed with Canadian First Nations organizations that have legal rights over resources and lands. The COSEWIC-ATK subcommittee has aboriginal co-chairs and members. It developed formalized community and species assessment protocols that are called upon when, for example, NDFs are to be made (reported by Danna Leaman and Gloria Goulet). COSEWIC thus coordinates the provision, integration and validation of information through participatory mechanisms that are adopted and implemented by scientific and local or indigenous experts and institutions. This approach seems to have commonalities with the approach taken at a global level by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) (see Annex II to IPBES Decision IPBES-5/1 on *Approach to recognizing and working with indigenous and local knowledge in the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*).

iii) Almost all experiences show that initial contacts between researchers and communities was established through institutions or individuals that were locally reputed, trusted, and recognized. Crucially, such institutions do not need to be specialized in a topic relevant to NDFs, but rather need to be willing and able to facilitate relevant local networks and help gaining the trust of local resource users or local experts with relevant knowledge. Such institutions could be councils of elders, mayors, party representatives, other local authorities, or religious leaders. Once initial contacts were made, almost all report that the snowball method (chains of referrals from one resource user or local expert to the next) ensure that relevant knowledge holders can be accessed. Only in few cases were there opportunities to strategically select informants from comprehensive databases (such as landowner registries reported by Christine Mitchell).

iv) Sources emphasize the benefits of collaborating with individuals who are part of and rooted in both western (possibly even academic) education and local communities (reported by Joanna Sucholas, Anja von der Loye, Danna Leaman, among others). Such persons not only facilitate the building of mutual understanding and trust, help to overcome potential cultural or language challenges, but can also be key in analysing, interpreting and validating results.

v) The tools that were applied to collect information ranged from semi-structured interviews, questionnaires, and facilitated workshops, to joint mapping exercises or collaborative field projects. They should be simple, understandable and tangible. In some instances, case studies mention the use of photographs (Turvey et al. 2013), mounted animal skins (Ziembicki et al. 2013), or field walks and herbarium specimens (Tomasini and Theilade 2019) to ensure that species identification is clear to informants. Otherwise, methods and tools seem as manifold as the case studies themselves, allow for much creativity, and need to be adapted to local context. For example, formal or semi-structured interviews would not be accepted by nomads in Egypt (reported by Marwa Halmy) and focus groups or moderated workshop discussions can be challenging in situations of high economic competition between knowledge holders, or where some activities might be considered controversial within the community (reported by Christine Mitchell).

Methods to ensure information is complete and objective, enabling science-based assessments in accordance with Resolution Conf. Res. 16.7 (Rev. CoP17):

i) Many of the approaches referred to in the section *supra*, in particular the involvement of bridge persons, building trustful relations with communities and ensuring selection of good informants through locally recognized institutions and snowball sampling are tools that enhance the quality and validity of responses.

ii) Participation and involvement of community members and informants in the research design is a form of pre-testing tools and methods, detecting possible misunderstandings of differences in assumptions early on, ensuring to ask the right questions (Eric Burkhart), and to make communities see their interest in providing information (Danna Leaman, Gloria Goulet).

iii) Similarly, validating results by presenting and re-discussing them with communities and informants reduces misinterpretations, and allows communities to share their interpretation of observed patterns. It is also described as a demonstration of respect to communities, and a means to give something back in exchange for their knowledge (Eric Burkhart, Sarah-Lan Mathez Stiefel).

iv) Virtually all sources concur that validity can be enhanced by triangulating information across multiple informants, communities or methods. Multiple examples of such validation approaches can be found in extensive detail in the case studies.

v) Many literature sources empirically validated indicators (e.g. for population trends, conservation status) by direct comparison of observations made by local community members and scientists. Examples are joint fieldwork, the comparison of observations of scientists and community members after clearly defined 'experimental forest walks' or sampling plots collaboratively monitored between scientists and local informants (Danielsen et al. 2014, Tomasini and Theilade 2019, Yan Zeng, James Chamberlain, Eric Burkhart).

vi) Several case studies indicate that local knowledge might not in all cases be directly validated with scientific sources (it also is particularly useful where no such knowledge exists), but overall plausibility can be judged by indirect inference. For example, Yan Zeng reports that the scientific plausibility of local knowledge in Chinese species assessments is reviewed through specific questions of more general, verifiable nature that reveal the accuracy of informant statements (such as questions on a species' life-history). Turvey et al. (2013) exclude certain observations from their analysis, due to perceived scientific implausibility.

vii) Assessments of plausibility can be elaborated into reliability indices, in which informant statements are rated according to various indicators of an informant's knowledge. Indicators may include whether an informant correctly identified a species, was an active harvester at the time of the research, was already actively harvesting for extended time spans, whether his statements were confirmed by other informants; and whether he is a recognised knowledge holder by other harvesters (see for example Tomasini and Theilade 2019, and Ziembicki et al. 2013). Based on overall plausibility ratings, certain statements may be excluded from an analysis, or considered less credible.

viii) When global markets open up for trade in a species that was previously used for local subsistence purposes, utilization and harvest might change, for example through large-scale collection activities in areas that were not previously exploited, or the employment of harvesters who are taken to sites where they have no interest in long-term conservation. Therefore, collectors may still have knowledge, but the scale and purpose of its utilization might result in different conservation impacts (reported by Marla Emery and Rainer Luick). An understanding of the scale and purpose of the documented knowledge is an important confidence measure of particularly relevance for high-volume export harvest. Such understanding can be improved by understanding the social structure (gender, class, age, authority structures, internal power relationships) and context of a community (who is an insider versus an outsider? Who is involved in harvest and distribution along the commodity chain, where do profits accumulate?).

ix) Where divergences between local and scientific knowledge persist despite validation and discussion with community members, deeper understanding of their causes might improve species assessments. Such causes might include differing spatial or temporal observation scales used in scientific reports and by local informants, differing species and ecosystem taxonomies, scientifically unrecognized rare or extreme events, or different implicit assumptions about species management strategies (Ziembicki et al. 2013, Rist et al. 2010, Christine Mitchell, Sarah Laird, among others). While intentional or unintentional biases might be at play in some instances, contradicting knowledge could also lead to new or better hypotheses (Moller et al. 2004), or point to the need for additional monitoring.

x) Several experts suggested that, under ideal circumstances, well designed research of local and traditional knowledge would require researchers or assessors that have both ecological, and anthropological skills (Marla Emery, Sarah Laird).

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