CONVENCIÓN SOBRE EL COMERCIO INTERNACIONAL DE ESPECIES AMENAZADAS DE FAUNA Y FLORA SILVESTRES

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Sexagésimo novena reunión del Comité Permanente
Ginebra (Suiza), 27 de noviembre - 1 de diciembre de 2017

Cuestiones de interpretación y aplicación

Cumplimiento y observancia general

EXAMEN DEL COMERCIO SIGNIFICATIVO DE ESPECÍMENES DE ESPECIES DEL APÉNDICE II

1. El presente documento ha sido preparado por la Secretaría.

Antecedentes

2. La función y las responsabilidades del Comité Permanente al realizar el Examen del comercio significativo de especímenes de especies del Apéndice II se describen en el párrafo 1 k) a p) y en el párrafo 2 de la Resolución Conf. 12.8 (Rev. CoP17), *Examen del comercio significativo de especímenes de especies del Apéndice II*.

3. Estas pueden sintetizarse como sigue: tras consultar con los miembros de los Comités de Fauna o de Flora a través de sus Presidencias, la Secretaría informa al Comité Permanente si las recomendaciones formuladas por los Comités Científicos para garantizar el cumplimiento del Artículo IV para el comercio de especies seleccionadas del Apéndice II han sido aplicadas o no por los Estados del área de distribución concernidos. A tenor del informe de la Secretaría, el Comité Permanente decide sobre las medidas adecuadas en aquellos casos en que la aplicación no ha sido satisfactoria, y formula recomendaciones al Estado concernido, o a todas las Partes. El Comité Permanente también ha de examinar las recomendaciones de suspender el comercio que han estado en vigor durante más de dos años y abordar los problemas encontrados durante proceso de examen que no estén relacionados con la aplicación de los párrafos 2 a), 3 o 6 a) del Artículo IV.

4. Todos los casos identificados para el examen que figuran en el presente documento se refieren a la fauna, y fueron seleccionados para el examen después de las reuniones 14ª o 15ª de la Conferencia de las Partes (CoP14, La Haya, 2007; CoP15, Doha, 2010). De conformidad con la Resolución Conf. 12.8 (Rev. CoP17), se ha consultado a los miembros del Comité de Fauna acerca de todos los casos siguientes.

5. **Después de la CoP14**, el Comité de Fauna seleccionó casos relativos a la fauna en sus reuniones 23ª y 24ª (AC23, Ginebra, abril de 2008; AC24, Ginebra, abril de 2009), que fueron examinados por el Comité Permanente en sus reuniones 62ª, 63ª, 65ª y 66ª (SC62, Ginebra, marzo de 2013; SC63, Bangkok, marzo de 2013; SC65, Ginebra, julio de 2014, SC66, Ginebra, enero de 2016).

   a) La SC62 determinó que Mozambique no había aplicado las recomendaciones del Comité de Fauna para *Hippopotamus amphibius* y se suspendió el comercio el 7 de septiembre de 2012 (Notificación a las Partes No. 2012/057).

   b) La SC63 recomendó que se suspendiera el comercio de *Pandinus imperator* de Togo hasta que el país hubiera demostrado que cumplía con los párrafos 2 a) y 3 del Artículo IV para esta especie, y presentara a la Secretaría información detallada sobre el cumplimiento de las recomendaciones del Comité de Fauna (Notificación No. 2013/13).

c) Ambas suspensiones del comercio fueron examinadas y mantenidas en la SC66. Sobre la base de la información reciente comunicada y en consulta con los miembros del Comité de Fauna a través de su Presidencia, en los párrafos 7 y 8 a continuación y en el Anexo 1 se examina y describe la situación de la aplicación de las recomendaciones del Comité de Fauna en relación con estas dos combinaciones de especies/Estados del área de distribución. En el Anexo 2 del presente documento se incluyen observaciones y recomendaciones adicionales del Comité de Fauna sobre ambos exámenes.

6. **Después de la CoP15**, el Comité de Fauna seleccionó casos en su 25ª reunión (AC25, Ginebra, julio de 2011), que fueron examinados por el Comité Permanente en sus reuniones 66ª y 67ª (SC66, Ginebra, enero de 2016; SC67, Johannesburgo, septiembre de 2016).

a) En la SC66, el Comité Permanente felicitó a Malasia por los progresos realizados en la aplicación de las recomendaciones a) y b) para *Python reticulatus*, y alentó al Estado del área de distribución a que finalizara la aplicación de las recomendaciones c) y d) antes del 2 de junio de 2016.

b) En la SC66, el Comité Permanente felicitó a Tailandia por los progresos realizados en la aplicación de las recomendaciones a), b) y c) del Comité de Fauna para *Hippocampus trimaculatus*, señalando sin embargo que no se había dado cumplimiento a las recomendaciones d) y e) en los plazos previstos. Se solicitó a Tailandia que finalizara la aplicación de las recomendaciones d), e), f) y g) antes del 2 de junio de 2016.

c) En la SC67, el Comité Permanente instó a Togo a que establezca cupos de exportación para *Chamaeleo gracilis* y *Kinixys homeana*, y a que aplique todas las recomendaciones pendientes antes del 2 de junio de 2017. Las recomendaciones del Comité Permanente figuran en el Acta resumida de la SC67.

d) En los párrafos 9 a 12 a continuación, y en el Anexo 1 del presente documento, se tratan las combinaciones de especies/Estados del área de distribución antes indicadas, así como la situación de aplicación de las recomendaciones. En el Anexo 2 del presente documento se incluyen observaciones y recomendaciones adicionales del Comité de Fauna en relación con *Python reticulatus* y las dos especies de Togo.

Casos seleccionados para el examen después de la CoP14

7. **Mozambique*: Hippopotamus amphibius***

Contexto del caso

a) El Comité de Fauna seleccionó *Hippopotamus amphibius* para el Examen del comercio significativo en la AC23. Mozambique no proporcionó una respuesta a las consultas de la Secretaría y, en la AC24, el Comité de Fauna mantuvo la combinación de especie/Estado del área de distribución en el Examen del comercio significativo basándose en las preocupaciones acerca de la disminución de las poblaciones y el aumento del comercio. En la AC25, el Comité de Fauna determinó que el comercio de *H. amphibius* de Mozambique era de "posible preocupación" y formuló recomendaciones.

b) Ante la falta de una respuesta de Mozambique, la Secretaría, tras consultas con las Presidencias del Comité de Fauna y del Comité Permanente, determinó que Mozambique no había dado cumplimiento a las recomendaciones. En la SC62, el Comité Permanente tomó la decisión de suspender el comercio de *H. amphibius* de Mozambique. La suspensión entró en vigor el 7 de septiembre de 2012 (Notificación a las Partes No. 2012/057).

c) El caso fue examinado en la SC66 (véase el documento SC66 Doc. 31.2), y se mantuvo la suspensión. En esa reunión, Mozambique informó de que estaba llevando a cabo investigaciones con relación al estado y la gestión de *H. amphibius* en respuesta a las recomendaciones del Examen del comercio significativo, y que una vez concluidas las mismas compartiría sus resultados con la Secretaría y el Comité Permanente.

Respuesta del Estado de distribución

d) En mayo de 2017, Mozambique presentó dos documentos a la Secretaría a fin de iniciar el proceso descrito en el párrafo o) de la Resolución Conf. 12.8 (Rev. CoP17), y para que el Comité Permanente considerase retirar la suspensión del comercio para *H. amphibius*. La información presentada incluyó

el estudio *"Status, management and Non-Detriment Finding for* Hippopotamus amphibius *(Common Hippopotamus) in Mozambique"*, que figura en el Anexo 4 del presente documento en el idioma y el formato en que se recibió, y un informe titulado "*Study of the distribution, abundance and conservation status of common hippopotamus* (Hippopotamus amphibius)" (BassAir 2017). Este último contiene los resultados de un relevamiento aéreo nacional centrado en los hipopótamos que se realizó en 2016. Mozambique ha solicitado que este informe se considere de carácter confidencial, aunque los resultados del estudio se presentan en el documento que figura en el Anexo 4.

Conclusión sobre la aplicación

e) En el Anexo 1 se presentan las recomendaciones originales del Comité de Fauna y las decisiones anteriores del Comité Permanente pertinentes, un análisis resumido de la información presentada por Mozambique en respuesta a estas recomendaciones y la evaluación de esta por la Secretaría, tras consultar con los miembros del Comité de Fauna a través de su Presidencia. El Comité de Fauna ha formulado otras observaciones detalladas y recomendaciones que figuran en el Anexo 2.

f) Basándose en la información mencionada, la Secretaría ha determinado que Mozambique ha aplicado las recomendaciones a), b) y c) del Comité de Fauna.

8. **Togo: *Pandinus imperator***

Contexto del caso

a) El Comité de Fauna seleccionó Pandinus imperator para el Examen del comercio significativo en la AC24. Determinó que el comercio de *P. imperator* de Togo era de "posible preocupación" y formuló recomendaciones en la AC26.

b) En junio de 2012, la Autoridad Administrativa de Togo acusó recibo de las recomendaciones, pero no se recibió ninguna otra comunicación; por lo tanto, en la SC63, el Comité Permanente estuvo de acuerdo con la conclusión de la Secretaría y la Presidencia del Comité de Fauna en cuanto a que no se había dado cumplimiento a las recomendaciones a) y b). El comercio de *P. imperator* de Togo posteriormente se suspendió hasta que el país hubiera demostrado que había cumplido los párrafos 2 a) y 3 del Artículo IV para esta especie, y proporcionara a la Secretaría información completa acerca del cumplimiento de las recomendaciones del Comité de Fauna (véase la Notificación No. 2013/13).

c) La suspensión se examinó en la SC66, y se mantuvo debido a que se requería más información para demostrar que las exportaciones previstas no serían perjudiciales para la especie en cumplimiento del Artículo IV de la Convención (véase la Notificación 2014/039). También se plantearon preocupaciones acerca del estado de la especie en Togo, los cupos elevados y los niveles de comercio de especímenes criados en granjas y de origen silvestre del país antes de la suspensión del comercio, habiéndose superado aparentemente los cupos.

d) En la SC67, se examinó el documento SC67 Doc. 15 Anexo 3 en relación con el Examen del comercio significativo respecto a *Chamaeleo gracilis* y *Kinixys homeana* de Togo, pero el documento también contenía algo de información sobre *P. imperator*. Este documento se somete a examen nuevamente en vista de la suspensión del comercio de *P. imperator* de Togo en vigor.

Respuesta del Estado de distribución

e) En la SC67, Togo presentó un estudio en el que se determinó que el cupo de extracción actual de 16.500 especímenes criados en granjas y 1.000 especímenes silvestres no resultaba perjudicial. En el estudio además se recomendaba que un aumento del cupo anual de exportación de especímenes vivos de *P. imperator* criados en granjas de 16.500 a 20.000 ejemplares no resultaría perjudicial.

Conclusión sobre la aplicación

f) En el Anexo 1 se presentan las recomendaciones originales del Comité de Fauna y las decisiones anteriores del Comité Permanente pertinentes, un análisis resumido de la información presentada por Togo en respuesta a estas recomendaciones y la evaluación de esta por la Secretaría, tras consultar con los miembros del Comité de Fauna a través de su Presidencia. Si bien reconoce que Togo ha desplegado esfuerzos para abordar algunas de las recomendaciones, el Comité de Fauna ha

formulado algunas observaciones y recomendaciones adicionales que pueden resultar útiles a Togo para abordar con mayor precisión las preocupaciones del Comité de Fauna (véase el Anexo 2).

g) Basándose en esta información, la Secretaría ha determinado que Togo no ha aplicado las recomendaciones del Comité de Fauna. Sin embargo, se han aplicado parcialmente las recomendaciones b) y c).

Casos seleccionados para el examen después de la CoP15

9. **Malasia: *Python reticulatus***

Contexto del caso

a) El Comité de Fauna seleccionó *Python reticulatus* para el Examen del comercio significativo en la AC25. Malasia presentó una respuesta a las consultas en la AC26, pero se mantuvo la especie en el proceso de examen. El Comité de Fauna determinó que el comercio de *P. reticulatus* de Malasia era de "posible preocupación" y formuló recomendaciones en la AC27.

b) Malasia presentó información completa en la que abordaba las recomendaciones del Comité de Fauna a corto plazo, que debían ser aplicadas antes del 31 de agosto de 2014. En la SC66, el Comité Permanente felicitó a Malasia por los progresos realizados en la aplicación de las recomendaciones a) y b), y alentó al país a que finalizara la aplicación de las recomendaciones c) y d) antes del 2 de junio de 2016.

Respuesta del Estado de distribución

c) El 2 de junio de 2016, Malasia presentó un informe titulado "*Information in Peninsular Malaysia's Non-Detriment Findings approach for trade in reticulated python (*Python reticulatus*) skins*" en respuesta a las recomendaciones c) y d) del Comité de Fauna. Este estudio figura en el Anexo 5 del presente documento. Durante este examen, se tuvo en consideración otra información disponible, en la que se incluye lo siguiente:

i) AC29 Doc. 31.1 *"Dictámenes de extracción no perjudicial para las serpientes: Guía para las Autoridades Científicas CITES";*

ii) AC29 Inf. 16 *"Sustainable management of the trade in reticulated python skins in Indonesia and Malaysia"; y*

iii) AC29 Inf. 17 *"Trade in python skins: Impact on livelihoods in Peninsular Malaysia".*

Evaluación provisional de la Secretaría

d) En el Anexo 1 se presentan las recomendaciones originales del Comité de Fauna y las decisiones anteriores del Comité Permanente pertinentes, un análisis resumido de la información presentada por Malasia en respuesta a estas recomendaciones y la evaluación de esta por la Secretaría, tras consultar con los miembros del Comité de Fauna a través de su Presidencia. El Comité de Fauna ha formulado otras observaciones detalladas y recomendaciones que figuran en el Anexo 2.

e) Basándose en la información mencionada, la Secretaría ha determinado que Malasia ha aplicado las recomendaciones c) y d) del Comité de Fauna pendientes.

10. **Tailandia: *Hippocampus trimaculatus***

Contexto del caso

a) El Comité de Fauna seleccionó *Hippocampus trimaculatus* para el Examen del comercio significativo en la AC25. Determinó que el comercio de *H. trimaculatus* de Tailandia era de "urgente preocupación" y formuló recomendaciones en la AC27.

b) En la SC66, el Comité Permanente felicitó a Tailandia por los progresos realizados en la aplicación de las recomendaciones a), b) y c) del Comité de Fauna, señalando sin embargo que no se había dado

cumplimiento a las recomendaciones d) y e) en los plazos previstos. Se solicitó a Tailandia que finalizara la aplicación de las recomendaciones d), e), f) y g) antes del 2 de junio de 2016.

d) En la SC67, se examinó el documento SC67 Doc. 15 Anexo 2 en relación con otras tres especies de *Hippocampus* de Tailandia (*H. kelloggi, H. kuda* y *H. spinosissimus*). En la SC67, el Comité Permanente recomendó que se excluyera a Tailandia del proceso de Examen del comercio significativo sobre *H. kellogi, H. kuda* y *H. spinosissimus*, reconociendo que Tailandia había suspendido la exportación de especímenes de *Hippocampus* spp. desde el 1 de enero de 2016 hasta próximo aviso, y que Tailandia informe a la Secretaría y a la Presidencia del Comité de Fauna sobre cualquier cambio en la suspensión del comercio de *H. kellogi, H. kuda* y *H. spinosissimus*, junto con una justificación, para obtener su aprobación (Acta resumida de la SC67). Dado que esta suspensión abarca todas las especies de *Hippocampus*, también se aplicaría a *Hippocampus trimaculatus.*

Respuesta del Estado de distribución

d) El documento SC67 Doc. 15, Anexo 2, incluía información sobre las actividades de investigación relacionadas con *Hippocampus* que se habían llevado a cabo en el país en 2013 y el primer semestre de 2014 en el contexto del proyecto de investigación denominado “Aplicación de la CITES para los caballitos de mar en Tailandia”, una iniciativa de colaboración entre Project Seahorse (Universidad de British Columbia) y el Departamento de Pesca de Tailandia. Algunas de estas actividades también resultan pertinentes en relación con las recomendaciones formuladas por el Comité de Fauna sobre *H. trimaculatus*. El documento también incluía información específica sobre *H. trimaculatus*, que comprendía una nota de Tailandia, de fecha 27 de mayo de 2016, con detalles pertinentes en relación con las recomendaciones d) a g). Esta información se está examinando ahora nuevamente en vista del examen en curso para esta especie de Tailandia.

Evaluación provisional de la Secretaría

e) En el Anexo 1 se presentan las recomendaciones originales del Comité de Fauna y las decisiones anteriores del Comité Permanente pertinentes, un análisis resumido de la información presentada por Tailandia en respuesta a estas recomendaciones (que figura en el documento SC67 Doc. 15, Anexo 2) y la evaluación de esta por la Secretaría, tras consultar con los miembros del Comité de Fauna a través de su Presidencia.

f) La Secretaría, en consulta con los miembros del Comité de Fauna a través de su Presidencia, ha determinado que, basándose en la información que Tailandia presentó a la SC67 y en ocasiones anteriores, no se ha dado cumplimiento o no se han cumplido en grado suficiente las recomendaciones d) a g). No obstante, sujeto a la confirmación por parte de Tailandia de que la suspensión de las exportaciones de *Hippocampus* spp. continúa en vigor, se podría suprimir *Hippocampus trimaculatus* del examen sujeto a las mismas condiciones que se aplican a *H. kelloggi, H. Kuda* y *H. spinosissimus;* es decir, que Tailandia informe a la Secretaría y a la Presidencia del Comité de Fauna sobre cualquier cambio en la suspensión del comercio de *H. trimaculatus*, junto con una justificación, para obtener su aprobación.

11. **Togo: *Chamaeleo gracilis***

Contexto del caso

a) El Comité de Fauna seleccionó *Chamaeleo gracilis* para el Examen del comercio significativo en la AC25. En la AC27, determinó que el comercio de *C. gracilis* de Togo era de “urgente preocupación” y formuló recomendaciones.

b) En la SC66, (véase el documento SC66 Doc. 31.1), la Secretaría explicó que no había recibido ninguna información de Togo en relación con la aplicación de las recomendaciones del Comité de Fauna para *C. gracilis*. La Secretaría, en consulta con la Presidencia del Comité de Flora, recomendó por lo tanto al Comité Permanente que recomendara a todas las Partes que suspendan el comercio de especímenes de *C. gracilis* de Togo hasta que ese país demostrara que había cumplido lo dispuesto en los párrafos 2 a) y 3 del Artículo IV, y proporcionara a la Secretaría información detallada sobre el cumplimiento de las recomendaciones del Comité de Fauna.

c) En la SC67, se examinó el documento SC67 Doc. 15, incluido el documento SC67 Doc. 15 Anexo 3, que contenía un estudio sobre cuatro especies de fauna objeto del comercio internacional en Togo,

incluida *C. gracilis*. El Comité Permanente solicitó a Togo que establezca para 2017 cupos de exportación para *C. gracilis* de 2.500 especímenes vivos criados en granjas y 500 especímenes vivos de origen silvestre; e instó a Togo a aplicar las recomendaciones d) a i) antes del 2 de junio de 2017 (véase el Anexo 1 del documento SC67 Doc. 15). Cabe señalar que en el documento SC67 Doc. 15 se determinó que la recomendación c) se había aplicado solo parcialmente y, por lo tanto, también se la considera en el presente examen.

Respuesta del Estado de distribución

d) Togo estableció para 2017 cupos de exportación de *C. gracilis* de 2.500 especímenes vivos criados en granjas y 500 especímenes vivos de origen silvestre. Estos cupos se publicaron el 6 de marzo de 2017, pero Togo no solicitó la inclusión de la restricción del tamaño con una longitud máxima desde el hocico hasta la abertura cloacal de 8 cm para los especímenes vivos de código de origen R que vayan a exportarse, como se solicitaba en la recomendación f).

e) No se ha recibido ninguna otra información nueva en relación con la aplicación de las recomendaciones d) a i) desde la SC67.

Evaluación provisional de la Secretaría

f) En el Anexo 1 se presentan las recomendaciones originales del Comité de Fauna y las decisiones anteriores del Comité Permanente pertinentes, un análisis resumido de la información presentada por Togo en respuesta a estas recomendaciones (que figura en el documento SC67 Doc. 15, Anexo 3) y la evaluación de esta por la Secretaría, tras consultar con los miembros del Comité de Fauna a través de su Presidencia. El Comité de Fauna ha formulado otras observaciones detalladas y recomendaciones que figuran en el Anexo 2.

g) La Secretaría, en consulta con los miembros del Comité de Fauna a través de su Presidencia, ha determinado que Togo aún debe aplicar plenamente la recomendación c) y no ha aplicado aún las recomendaciones d) a i) del Comité de Fauna.

12. **Togo: *Kinixys homeana***

Contexto del caso

a) El Comité de Fauna seleccionó *Kinixys homeana* para el Examen del comercio significativo en la AC25. En la AC27, determinó que el comercio de *K. homeana* de Togo era de “posible preocupación” y formuló recomendaciones.

b) En el documento SC66 Doc. 31.1, preparado para su examen en la SC66, la Secretaría explicó que no había recibido ninguna información de Togo en relación con la aplicación de las recomendaciones del Comité de Fauna para *K. homeana*. La Secretaría, en consulta con la Presidencia del Comité de Flora, recomendó por lo tanto que el Comité Permanente recomendara a todas las Partes que suspendan el comercio de especímenes de *K. homeana* de Togo hasta que ese país demostrara que había cumplido lo dispuesto en los párrafos 2 a) y 3 del Artículo IV, y proporcionara a la Secretaría información detallada sobre el cumplimiento de las recomendaciones del Comité de Fauna.

c) En la SC67, se examinó el documento SC67 Doc. 15 Anexo 3, que contenía un estudio sobre cuatro especies de fauna objeto del comercio internacional en Togo, incluida *K. homeana*. El Comité Permanente solicitó a Togo que establezca para 2017 cupos de exportación para *K. homeana* de 400 especímenes vivos criados en granjas con un tamaño límite inferior a 10 centímetros y ningún espécimen de origen silvestre; e instó a Togo a aplicar las recomendaciones c) a h) antes del 2 de junio de 2017 (véase el Anexo 1 del documento SC67 Doc. 15). Cabe señalar que en el documento SC67 Doc. 15 se determinó que la recomendación d) se había aplicado solo parcialmente y, por lo tanto, también se la considera en el presente examen.

Respuesta del Estado de distribución

d) De conformidad con lo solicitado por la SC67, Togo estableció cupos de exportación para *Kinixys homeana* para 2017 de 400 especímenes vivos criados en granjas y ningún espécimen de origen silvestre. Estos cupos se publicaron el 6 de marzo de 2017. Sin embargo, Togo no solicitó que el límite

de tamaño recomendado por la SC67 e incluyera en el cupo y estos [por lo tanto] no están incluidos en los cupos indicados en la página web de la Secretaría.

e) No se ha recibido ninguna información nueva en relación con la aplicación de las recomendaciones c) a h).

Evaluación provisional de la Secretaría

f) En el Anexo 1 se presentan las recomendaciones originales del Comité de Fauna y las decisiones anteriores del Comité Permanente pertinentes, un análisis resumido de la información presentada por Togo en respuesta a estas recomendaciones (que figura en el documento SC67 Doc. 15, Anexo 3) y la evaluación de esta por la Secretaría, tras consultar con los miembros del Comité de Fauna a través de su Presidencia. El Comité de Fauna ha formulado otras observaciones detalladas y recomendaciones que figuran en el Anexo 2.

g) La Secretaría, en consulta con los miembros del Comité de Fauna a través de su Presidencia, ha determinado que Togo aún debe aplicar las recomendaciones c) a h), con la excepción de la recomendación d) que la SC67 consideró que se había aplicado parcialmente.

Problemas identificados por los Comités de Fauna y de Flora que no están relacionados con la aplicación de los párrafos 2 a), 3 o 6 a) del Artículo IV.

13. En la Resolución Conf. 12.8 (Rev. CoP17), párrafo 2, se encarga al Comité Permanente que aborde los problemas identificados durante el proceso de examen que no están relacionados con la aplicación de los párrafos 2 a), 3 o 6 a) del Artículo IV, de conformidad con otras disposiciones de la Convención y de las resoluciones relevantes. Al respecto, los casos identificados durante la 29ª reunión del Comité de Fauna y la 23ª reunión del Comité de Flora se presentan en el Anexo 3 para que sean examinados por el Comité Permanente.

Examen de las recomendaciones de suspender el comercio que han estado en vigor durante más de dos años

14. En virtud de la Resolución Conf. 12.8 (Rev. CoP17), párrafo 1 p), el Comité Permanente, en consulta con la Secretaría y la Presidencia del Comité de Fauna o de Flora, revisará las recomendaciones de suspender el comercio que hayan estado en vigor durante más de dos años, evaluará las razones para ello en consulta con el Estado del área de distribución, y, según proceda, tomará medidas para resolver la situación. Esos exámenes se han llevado a cabo en forma irregular, en las reuniones SC57, SC59 y SC62, y más recientemente en la SC66 (véase el documento SC66 Doc. 31.2). La Secretaría informa que presentará el próximo informe completo para que sea examinado en la SC70.

Progresos logrados en la aplicación de las Decisiones 17.108 a 17.110

15. En la CoP17, la Conferencia de las Partes adoptó las Decisiones 17.108 y 17.110, sobre el *Examen del comercio significativo*, cuyo texto es el siguiente:

Dirigida a la Secretaría

17.108 *Sujeto a la disponibilidad de financiación y en un plazo de seis meses tras la adopción de una revisión de la Resolución Conf. 12.8 (Rev. CoP17), sobre* Examen del comercio significativo de especímenes de especies del Apéndice II*, basándose en la labor efectuada hasta la fecha, la Secretaría deberá preparar, poner a prueba y establecer una base de datos para el seguimiento y la gestión del Examen del comercio significativo como un instrumento esencial para la aplicación efectiva y la transparencia del proceso.*

17.109 *Sujeto a la disponibilidad de financiación y en un plazo de seis meses tras la adopción de la Resolución Conf. 12.8 (Rev. CoP17), la Secretaría deberá preparar una guía fácil de usar sobre el Examen del comercio significativo que pueda incluirse también en la carta inicial a los Estados del área de distribución.*

17.110 *Sujeto a la disponibilidad de financiación y en un plazo de seis meses tras la adopción de la Resolución Conf. 12.8 (Rev. CoP17), la Secretaría deberá preparar un módulo de formación exhaustivo sobre el Examen del comercio significativo (incluyendo estudios de caso, según proceda).*

16. La Secretaría se complace en informar que se han conseguido fondos para lograr avances en todas las decisiones relacionadas con el Examen del comercio significativo. La Secretaría desea agradecer especialmente el generoso apoyo de la Unión Europea para este fin.

17. En lo que respecta a la Decisión 17.108, ya se han logrado algunos progresos. Teniendo en cuenta el nuevo proceso del Examen del comercio significativo, así como los avances tecnológicos en la gestión electrónica de documentos, la Secretaría desarrollará un nuevo sistema interno de base de datos para el seguimiento y la gestión del Examen del comercio significativo, centrándose en mejorar la facilidad de uso, especialmente para las Partes que están sujetas al Examen del comercio significativo. El desarrollo de este nuevo sistema requerirá profesionales altamente experimentados en tecnología de semántica de web y la asignación de tiempo suficiente para planificar y ejecutar cuidadosamente las tareas requeridas. La Secretaría elaboró un plan de proyecto y cronograma realista, como se describe en el documento AC29 Inf. 19/PC23 Inf. 13. El plan de trabajo se ha revisado teniendo en cuenta las observaciones de los Comités científicos, y la Secretaría está logrando progresos en la ejecución del proyecto. Probablemente, habrá un proceso continuo de desarrollo y mejoras en los próximos años. No obstante, como medida provisional, la Secretaría CITES ha desarrollado un sistema tabular, en el que ha incluido funciones de búsqueda según varios parámetros (tales como Parte, orden taxonómico, fases/etapas y reunión). Esta herramienta provisional está disponible en el sitio web de la CITES (https://cites.org/eng/imp/sigtradereview/interim_rst_system).

Recomendaciones

18. Se invita al Comité Permanente a adoptar las recomendaciones formuladas por la Secretaría que se detallan en el Anexo 1 del presente documento, y a tomar nota de las observaciones adicionales y el asesoramiento formulados por el Comité de Fauna que figuran en el Anexo 2.

19. La Secretaría recuerda que en su 59ª reunión (SC59, Doha, marzo de 2010), el Comité Permanente señaló que todas las recomendaciones que formule de suspender el comercio en el contexto del Examen del comercio significativo se aplicaban únicamente al comercio abarcado por el Artículo IV de la Convención, y no al comercio abarcado por el Artículo VII. Es decir, no se aplican a los especímenes de especies animales criados en cautividad o las especies de plantas reproducidas artificialmente (códigos de origen “C” y “A”).

20. Se invita al Comité Permanente a considerar dónde se requieren medidas en los casos remitidos por los Comités de Fauna y de Flora que se presentan en el Anexo 3.

21. Se invita al Comité Permanente a tomar nota de la información que se presenta en los párrafos 14 a 17.

RECOMENDACIONES DEL COMITÉ DE FAUNA Y EL COMITÉ PERMANENTE PARA LAS ESPECIES SELECCIONADAS PARA EL EXAMEN DEL COMERCIO SIGNIFICATIVO; RESPUESTAS DE LOS ESTADOS DEL ÁREA DE DISTRIBUCIÓN; CONCLUSIÓN SOBRE LA APLICACIÓN Y RECOMENDACIONES DIRIGIDAS AL COMITÉ PERMANENTE

Recomendaciones del Comité de Fauna y decisiones del Comité Permanente cuando estas existen	**Resumen de respuestas de los Estados del área de distribución**	**Conclusión sobre la aplicación y medidas recomendadas**
***Hippopotamus amphibius* (Hipopótamo anfibio o común)**		
Mozambique (MZ) (Posible preocupación) En el plazo de 90 días (para el 4 de enero de 2012): a) La Autoridad Administrativa debe proporcionar una explicación del "sistema interno de cupos anuales" y otras medidas de gestión en vigor, y aclarar las discrepancias observadas entre los datos de aduanas comunicados (importaciones) y los datos de la CITES (exportaciones) a que se hace referencia en el documento AC25 Doc 9.4; b) Información derivada de la encuesta nacional realizada en 2008 sobre la distribución, la abundancia y el estado de conservación de *H. amphibius* en MZ, incluidos detalles de metodologías empleadas; y c) Justificación, y detalles, de la base científica que han servido para determinar que las cantidades de *H. amphibius* exportadas no eran perjudiciales para la supervivencia de la especie, y están en conformidad con los párrafos 2 a) y 3 del Artículo IV. *En su 62ª reunión (SC62, Ginebra 2012), el Comité Permanente recomendó la suspensión del comercio de* Hippopotamus amphibius *de Mozambique. La suspensión entró en vigor el 7 de septiembre de 2012. Se examinó en la SC66 (Ginebra, 2016) y se mantuvo.*	- En mayo de 2017, Mozambique presentó dos documentos en respuesta a la nota de consulta de la Secretaría: 1) un informe titulado "*Status, management and Non-Detriment Finding for* Hippopotamus amphibius *(Common Hippopotamus) in Mozambique"* y 2) un informe titulado "*Study of the distribution, abundance and conservation status of common hippopotamus (*Hippopotamus amphibius*)*", que es el informe final del relevamiento aéreo centrado en los hipopótamos realizado en 2016 (BassAir 2017). Mozambique ha solicitado que el informe BassAir se considere de carácter confidencial, aunque los resultados del estudio se presentan en el documento del DENP. - El DENP de Mozambique para los hipopótamos, que incluye detalles sobre el estado general de la especie en el país y el régimen de gestión propuesto, se aplicará en forma adaptable. En el DENP se determina que el bajo nivel de extracción generado por la caza deportiva no es perjudicial para la supervivencia de la especie y que la cantidad de ingresos generados son de esencial importancia para la conservación de la especie, especialmente considerando los beneficios que aportan a las comunidades locales. En el informe también se señala que las principales amenazas a las poblaciones de hipopótamo en Mozambique son la	<u>Conclusión de la Secretaría y el Comité de Fauna en relación con la aplicación de las recomendaciones</u> Se han cumplido las recomendaciones del Comité de Fauna. <u>Medidas recomendadas por la Secretaría</u> **Se invita al Comité Permanente a suprimir *Hippopotamus amphibius* de Mozambique del Examen del comercio significativo.**

	modificación del hábitat y los conflictos con los seres humanos. - El informe BassAir se refiere a un relevamiento aéreo nacional centrado en los hipopótamos, iniciado por la Administración Nacional de Áreas de Conservación de Mozambique como parte del proyecto MOZBIO (Banco Mundial), que se llevó a cabo entre el 20 de noviembre y el 4 de diciembre de 2016. En los resultados del relevamiento se estima que hay alrededor de 7.300 individuos en las áreas estudiadas en Mozambique. Las áreas relevadas por Mackie *et al.* (2012) fueron relevadas nuevamente para comprobar la uniformidad. Teniendo en cuenta los factores de corrección y la existencia de otras áreas de hábitat adecuadas, se estima que la población mínima de hipopótamos es de mayor que 8.000 individuos. La extracción máxima propuesta de 80 animales (incluidos el control de animales problemáticos y los cupos para las comunidades) representa el 1% de la población. <u>Con relación a la recomendación a):</u> - Mozambique ha confirmado que la asignación del cupo para caza se limitará a los puntos críticos identificados en el relevamiento hipopótamos realizado en 2016, específicamente a lo largo de los ríos Rovuma-Lugenda (en la Reserva Nacional Niassa), en el Embalse Cahora Bassa y en el río Zambezi. El cupo para caza deportiva se establecerá entre el 0,5% y el 0,6% de la población (limitado a machos adultos) que se encuentra en las áreas de caza. La extracción máxima sostenible es de 80 individuos, lo que representa el 1% la población total estimada de 8.000 individuos. Anteriormente (2009-2012), los cupos de Mozambique para los hipopótamos se establecieron entre el 1,27% y el 2,07% de la estimación de la población de 2008, de 8.388 individuos (AGRECO, 2009). El cupo revisado, por lo tanto, es más conservador que el cupo anterior. Mozambique también presentó aclaraciones acerca de las discrepancias señaladas entre los datos notificados	

	por la aduana (importaciones) y los datos de la CITES (exportaciones) a las que se hace referencia en el documento AC25 Doc. 9.4, en el que se señaló que los exportadores habían notificado un número de dientes de origen silvestre que duplicaba el número que había notificado Mozambique. Un análisis del informe anual de 2012 determinó que se habían notificado 12 “cráneos” en lugar de 12 “dientes”, que figuraban en 66 de los 98 permisos expedidos para 99 hipopótamos ese año. Si se tiene en cuenta que 12 dientes equivalen a un hipopótamo, esto puede ayudar a explicar las discrepancias señaladas. Con relación a la recomendación b): Mozambique no ha facilitado información resultante del estudio nacional realizado en 2008 sobre la distribución, la abundancia y el estado de conservación de *H. amphibius* en MZ, incluidos detalles de las metodologías empleadas. En su lugar, ha facilitado información más actualizada de un relevamiento aéreo centrado en los hipopótamos realizado en 2016, con detalles pormenorizados acerca de las metodologías empleadas. Con relación a la recomendación c): Mozambique ha presentado un DENP detallado que abarcará un período de cinco años (2017-2022), pero que se actualizará anticipadamente si hay nueva información disponible. En el DENP se reconoce que no hay un plan nacional de gestión de la especie, pero ser indica que ahora se pueden comenzar los trabajos relacionados con este plan gracias a la financiación recibida a través del proyecto MOZBIO. - Para resumir, el documento del DENP presentado describe con gran detalle la situación actual de la población y la compara con las estimaciones anteriores y los resultados del relevamiento realizado. En particular, abordar las preocupaciones vinculadas con las estimaciones de la Unión Internacional para la Conservación de la Naturaleza (UICN), de alrededor de 18.000 animales, que indica una marcada disminución de la población de hipopótamos en	

	Mozambique. Parece haber motivos fundados para poner esa cifra en duda, y puede haberse tratado de una sobreestimación de las cifras reales. En relación con la distribución actual, el tamaño de la población y las amenazas a la especie, estos aspectos están muy bien presentados y confirman un estado actualmente estable de la población, con más de 8.000 individuos. La gestión propuesta para la especie, con una captura máxima de 80 individuos, incluida la posible matanza de animales problemáticos, parece ser una captura sostenible. Además, el anuncio de la elaboración de un plan nacional de gestión, así como la continuación de la evaluación del estado de la población también son buenos indicios de que se está aplicando un programa de captura sostenible en consonancia con los requisitos de la CITES.	
***Pandinus imperator* (Escorpión emperador)**		
Togo (TG) (Posible preocupación) Antes de 90 días, la Autoridad Administrativa debería: a) informar a la Secretaría de que Togo mantendrá un cupo de exportación anual a un nivel que no sobrepase el cupo de exportación publicado actualmente (1.000 especímenes silvestres y 16.500 criados en granjas) como medida cautelar, mantendrá la restricción de tamaño de una longitud máxima total de 10 cm (o una longitud máxima del cuerpo, excluyendo la cola, de 5 cm) de los especímenes vivos de código de origen R que vayan a exportarse, que debería publicarse con los cupos de exportación ; y b) proporcionar a la Secretaría información detallada sobre las medidas de control utilizadas para diferenciar entre los especímenes criados en granjas y los capturados en el medio silvestre, a fin de garantizar que las exportaciones autorizadas de especímenes criados en granjas no se aumentan con especímenes silvestres declarados indebidamente.	En la SC67, Togo presentó un estudio relativo a cuatro especies, entre las que se incluye *P. imperator*, en respuesta a las recomendaciones del Comité de Fauna. Con relación a la recomendación a): No se ha notificado un cupo de exportación, pero esto resulta comprensible si se considera la suspensión del comercio en vigor para esta especie de Togo. Con relación a la recomendación b): La recomendación se ha aplicado parcialmente. En el informe se facilitan algunos detalles sobre las operaciones de cría en granjas en Togo, indicando que, según Ineich (2006), la especie se explota en cría en granjas en un área definida durante cinco años consecutivos en los diferentes establecimientos de cría en granjas. Sin embargo, la sección 4.1.1 sobre cría en granjas no menciona los métodos utilizados para *P. imperator*. En la sección se incluye algo de información sobre el método de recolección. El informe genera algunas dudas sobre las tasas de producción informadas para los establecimientos de cría en	Conclusión de la Secretaría y el Comité de Fauna en relación con la aplicación de las recomendaciones Las recomendaciones b) y c) se han aplicado parcialmente. No se ha dado cumplimiento a las recomendaciones a), d) y e) del Comité de Fauna. Medidas recomendadas por la Secretaría **Se invita al Comité Permanente a:** **i) mantener *Pandinus imperator* de Togo en el Examen del comercio significativo, e** **ii) instar a Togo a que aplique plenamente las recomendaciones a) a e) antes del 27 de abril de 2018.**

Antes de 2 años, la Autoridad Administrativa debería: c) realizar una evaluación de la situación nacional, incluyendo una evaluación de las amenazas para la especie; e informar a la Secretaría sobre las medidas de gestión en vigor, subrayando si se han introducido nuevas medidas de gestión para tomar en consideración toda nueva información disponible sobre la situación de la especie en Togo; d) establecer cupos de exportación anual revisados (según proceda) para los especímenes capturados en el medio silvestre o criados en granjas a tenor de los resultados de la evaluación; y e) presentar la justificación y los pormenores de la base científica a partir de la que se ha determinado que esos cupos no serán perjudiciales para la supervivencia de la especie en el medio silvestre y están en conformidad con los párrafos 2 (a) y 3 del Artículo IV.	granjas. Por ejemplo, según los datos del Cuadro 10, de seis establecimientos, cuatro parecen no tener animales o tienen muy pocos animales. Teniendo en cuenta que se requieren por lo menos 8 a 10 meses para producir especímenes de un tamaño adecuado para la exportación, existen dudas acerca del número de especímenes que se sostiene que se han exportado. El informe no contiene ninguna explicación acerca de cómo se mantienen los animales capturados en el medio silvestre separados de los especímenes criados en granjas en los establecimientos en cuestión, o de qué medidas de control se utilizan para diferenciar los especímenes silvestres de los especímenes criados en granjas en el comercio. En el estudio se señala que generalmente no se comprende la diferencia entre los códigos de origen C y R y que no resultaría posible hacer verificaciones rigurosas de las entradas y salidas de cada establecimiento. Aún se debe establecer un sistema permanente de marcado para diferenciar entre los especímenes silvestres y los especímenes criados en granjas. <u>Con relación a la recomendación c):</u> La recomendación se ha aplicado parcialmente. El estudio indica que “hay poblaciones muy abundantes de esta especie en el sur de Togo y que la especie es muy frecuente en todo el país”, aunque no se cita la fuente de esta afirmación. Se ha realizado una evaluación de la población, pero más a nivel local que en el área de explotación. El informe se basa la evaluación de la población en visitas a seis establecimientos de cría aprobados y estudios de campo en las áreas de recolección que utilizan los establecimientos para establecer la tendencia y el estado de la población. Como se indica en el Cuadro 9, se relevaron cinco áreas, identificando el número de “galerías” de escorpiones en un sector de 50 m de ancho, con registradores colocados a intervalos de 10 m, abarcando superficies de 1 hectárea. El número de individuos se estima a partir del número de “galerías” existentes, o si se contaron los especímenes	

	reales. Aparentemente, todas las áreas eran tierras de barbecho. Los datos presentados en el documento acerca de la abundancia y las densidades de *Pandinus imperator* indican entre 122 y 147 individuos por hectárea en Ahépé y entre 181 y 217 individuos por hectárea en Adangbe. No obstante, estas cifras no se extrapolaron en función de la superficie del hábitat adecuado para la especie o que este ocupa actualmente. Tampoco hay una comparación entre las zonas en las que no se realiza ninguna captura con aquellas donde se capturan especímenes. Esto permitiría confirmar la conclusión del informe en cuanto a que la captura no tiene efectos negativos en las poblaciones. En el informe, se señalan el cambio climático y la sobreexplotación como amenazas. No se incluyeron detalles sobre medidas de gestión. <u>Con relación a la recomendación d):</u> En el estudio se afirma que la captura no tiene efectos negativos en las poblaciones, sosteniendo que "el cupo de 16.500 especímenes para Togo parece adaptarse bien a la posible producción y la demanda internacional" y que el cupo de exportación para los especímenes criados en granjas podría incluso aumentarse. Llega a la conclusión de que un aumento a 20.000 especímenes criados en granjas no sería perjudicial para la supervivencia de la especie, pero no respalda esa afirmación con información de apoyo. <u>Con relación a la recomendación e):</u> El informe proporciona algo de información respecto a esta recomendación. Afirma que los cupos establecidos por Togo ya han sido relativamente constantes desde que se establecieron, aunque también se señala que "los cupos se han superado regularmente y que no tienen en cuenta ningún fundamento científico". En el informe se recomienda que los cupos futuros se establezcan teniendo en cuenta no solo el número de hembras si no también la proporción real de hembras reproductoras.	

	Por último, en el informe se afirma que existen varias preocupaciones en relación con la capacidad operativa de las Autoridades tanto Científica como Administrativa en Togo. Esto arroja dudas sobre la manera en que se formulan los DENP y se hace un seguimiento de las operaciones de cría en granjas.	
***Python reticulatus* (pitón reticulada)**		
Malasia (MY) (Posible preocupación) En un plazo de 90 días (para el 31 de agosto de 2014) la Autoridad Administrativa debe: a) proporcionar una justificación, y los detalles, de la base científica por la que se ha establecido que los cupos de exportación de especímenes silvestres de *P. reticulatus* no son perjudiciales para la supervivencia de la especie y están en conformidad con los párrafos 2 a) y 3 del Artículo IV; b) proporcionar detalles a la Secretaría de la CITES sobre las medidas de control utilizadas para diferenciar entre especímenes procedentes de MY peninsular y Sabah; Antes de 2 años (para el 2 de junio de 2016): c) proporcionar a la Secretaría los resultados del estudio del dictamen de extracción no perjudicial que deberá quedar terminado a finales de 2015; y d) establecer, en consulta con la Secretaría, un cupo de exportación anual revisado (con inclusión de un cupo nulo, si procede) de especímenes capturados en el medio silvestre, sobre la base de los resultados del estudio mencionado anteriormente. *En la SC66, el Comité Permanente determinó que se habían aplicado las recomendaciones a) y b) y alentó a MY a que finalizara la aplicación de las recomendaciones c) y d) antes del 2 de junio de 2016.*	- El 2 de junio de 2016, Malasia presentó un informe titulado "*Information in Peninsular Malaysia's Non-Detriment Findings approach for trade in reticulated python (*Python reticulatus*) skins*" en respuesta a las recomendaciones c) y d) del Comité de Fauna. Durante este examen, se tuvo en consideración otra información disponible, en la que se incluye lo siguiente: - AC29 Doc. 31.1 *"Dictámenes de extracción no perjudicial para las serpientes: Guía para las Autoridades Científicas CITES"* - AC29 Inf. 16 *"Sustainable management of the trade in reticulated python skins in Indonesia and Malaysia"* - AC29 Inf. 17 *"Trade in python skins: Impact on livelihoods in Peninsular Malaysia"* Con relación a la recomendación c): El informe titulado *"Information on Peninsular Malaysia's Non-Detriment Findings approach for trade in reticulated python (*Python reticulatus*) skins"* es el estudio de 2015 al que se hace referencia en la recomendación c). Este informe ha sido preparado por las Autoridades Administrativa y Científica CITES, en estrecha consulta con los comerciantes y cazadores de pitón de Malasia peninsular, así como con la Asociación para la conservación de la pitón (PCP) y el Grupo de Especialistas en Boas y Pitones de la Comisión de Supervivencia de Especies de la UICN. Se indica que los objetivos del informe fueron los siguientes:	Conclusión de la Secretaría y el Comité de Fauna en relación con la aplicación de las recomendaciones Se ha dado cumplimiento a las recomendaciones c) y d) pendientes. Medidas recomendadas por la Secretaría **Se invita al Comité Permanente a:** **i) suprimir *Python reticulatus* de Malasia del Examen del comercio significativo, e** **ii) instar a Malasia a que publique su cupo revisado de 162.000 pieles de Malasia peninsular.**

	1. proporcionar un resumen de la biología y el comercio de la pitón reticulada en Malasia; 2. proporcionar resultados detallados de los estudios de los dictámenes de extracción no perjudicial de Malasia; 3. presentar las medidas adoptadas para revisar los protocolos de gestión y programas de seguimiento de los futuros DENP para la pitón reticulada en Malasia; y 4. proporcionar información para apoyar la conclusión acerca del comercio no perjudicial de pieles de pitón de Malasia. El informe proporciona detalles acerca de la distribución de la pitón reticulada y la variedad de hábitats que ocupa esta especie generalista, una reseña histórica de los niveles de comercio, la legislación nacional que ofrece protección a la especie en el medio silvestre y las condiciones en las que se puede cazar y comercializar la especies, así como el régimen de seguimiento de los comerciantes de pieles de pitón. El informe también presenta detalles acerca del estudio de marcado y recaptura, de cuatro años de duración, que se realizó en Malasia peninsular y de la manera en que este estudio se ha utilizado para estimar la población de pitón reticulada. A fin de mejorar la calidad de la estimación de la población, el Departamento de Vida Silvestre y Parques Naturales comenzó a recopilar datos biológicos de las pitones capturadas y a hacer un seguimiento de las instalaciones de procesamiento (2012-2016). Los resultados sugieren que estas pitones poseen un conjunto de atributos que las hacen resilientes a la explotación. Por ejemplo, se determinó que el tamaño corporal estaba aumentado, lo que no hubiera sido esperable si la población fuera objeto de sobreexplotación. También se realizaron entrevistas con los interesados directos para tratar de identificar tendencias temporales en los atributos de la explotación de las pitones. En el informe también se destacan los cambios que se realizarán para mejorar la gestión y regulación del comercio, aumentar la	

	seguridad de que la extracción continuará siendo no perjudicial para la supervivencia de la especie en el medio silvestre, lo que incluirá la prohibición de la caza y la captura de pitones de menos de 240 cm de longitud desde el hocico hasta la abertura cloacal. Se estima que esta restricción de tamaño reducirá 13% el volumen total del comercio. En el informe se llega a la conclusión de que el comercio de pitones reticuladas es sostenible siempre que: a) las pitones reticuladas continúen siendo abundantes, b) se las extraiga solamente de una parte de su área de distribución, c) prosperen en hábitats modificados, d) la frecuencia de captura sea baja, e) la extracción de pitones sea estacional, f) una gran proporción de pitones se reproduzcan antes de su explotación, g) los interesados directos sigan activamente prácticas sostenibles, h) el seguimiento sea continuo, i) la gestión del comercio sea sólida y pueda ser adaptable si es necesario y j) si no hay pruebas de que exista comercio ilegal. <u>Con relación a la recomendación d):</u> En el estudio del DENP se llega a la conclusión de que el cupo de captura de 162.000 especímenes por año es sostenible. El informe menciona una estimación de la población de entre 181.424 y 651.177 animales en 2013, lo que significaría que la captura podría representar entre el 25% y el 89% de la población total. No obstante, Malasia sostiene que estas estimaciones (en función de la índole de la metodología de muestreo utilizada) no son confiables y que es probable que la población sea mucho más alta que las estimaciones extrapoladas, de entre 181.424 y 1.904.952 animales, lo que representaría entre 26% y 1175% de la población. Por lo tanto, Malasia propuso, en lugar de revisar el cupo, establecer niveles adicionales de regulación para controlar las extracciones (imponiendo límites de tamaño) a fin de ayudar a garantizar que la extracción no sea perjudicial. Cabe recordar que Malasia comenzó a imponer un cupo de exportación voluntario de 180.000 pieles de pitón	

	desde 2005, como una forma de control del comercio a nivel nacional. En 2010, el Departamento de Vida Silvestre y Parques Nacionales había iniciado estudios de la población de pitones reticuladas utilizando el método de marcado y recaptura como parte de sus dictámenes de extracción no perjudicial (DENP). En 2011, el cupo se redujo a 162.000 pieles de pitón en función de las tendencias de caza y comercio, así como de las pieles restantes como existencia de los comerciantes en Malasia peninsular. Si bien se redujo el cupo, se continuó realizando el estudio para el DENP utilizando el método de marcado y recaptura. El cupo de exportación anual de 162.000 pieles de pitón que se estableció en 2011 representa menos del 27% de la población estimada en Malasia peninsular, según los cálculos de Malasia, lo que se considera no perjudicial para la población, dado que la naturaleza de esta especie representa una alta probabilidad de supervivencia. Para resumir, el documento presentado por Malasia presenta una síntesis adecuada de las deliberaciones que se mantuvieron en el seno de la CITES sobre el uso sostenible de esta especie. La dificultad para obtener estimaciones precisas de las poblaciones de serpientes es real, dado que los métodos que se aplican usualmente, como la estimación de la población basada en la biología y el posible hábitat de la especie, o relevamientos de marcado y recaptura, no arrojan datos confiables. Las deficiencias de las estimaciones anteriores de la población están bien explicadas en el informe. Las pruebas mucho más convincentes que demuestran que la extracción intensiva durante los últimos 20 años no ha tenido un efecto negativo en los parámetros esenciales de las poblaciones de la especie pueden considerarse un buen indicio de que las cantidades exportadas han sido sostenibles. Considerando todos los conocimientos sobre la biología que se han recopilado, el inicio de un régimen de gestión que incluye el uso de límites de tamaño para las extracciones en lugar de cupos parece ser un camino a seguir conservador. También guarda conformidad con la	

	orientación sobre los DENP que se aprobó recientemente en la AC29.	
Hippocampus trimaculatus		
Tailandia (TH) (**Urgente preocupación)** Tomando en cuenta las medidas descritas en el documento AC27 Inf. Doc. 9 y sin menoscabo del trabajo que ya ha sido realizado para las especies de *Hippocampus* en TH: En un plazo de seis meses (para el 2 de diciembre de 2014) la Autoridad Administrativa debe: a) aclarar la protección legal que se otorga a *H. trimaculatus* en TH y proporcionar información a la Secretaría sobre los controles o la regulación de la actividad pesquera que de otro modo podría tener efectos perjudiciales para las poblaciones de caballitos de mar; b) proporcionar la información disponible a la Secretaría sobre la distribución, la abundancia, las amenazas y el estado de conservación de *H. trimaculatus*, y cualesquiera medidas de gestión establecidas actualmente en TH; y c) proporcionar una justificación, y los detalles, de la base científica por la que se ha establecido que las cantidades de *H. trimaculatus* exportadas no serán perjudiciales para la supervivencia de la especie y están en conformidad con los párrafos 2 a) y 3 del Artículo IV, teniendo en cuenta toda captura y todo comercio potencial no regulados y/o ilegales. En el plazo de un año (para el 2 de junio de 2015) la Autoridad Administrativa debe: d) proporcionar información de los estudios (existentes o nuevos) para evaluar la variación de la abundancia espacial o temporal de *H. trimaculatus* a fin de poder identificar zonas de gran densidad de caballitos de mar, como base para considerar las restricciones en la zona de las artes de pesca no selectiva para obtener especies de Hippocampus como captura incidental, y presentar un informe a la Secretaría;	Tailandia proporcionó información parcial relativa a las recomendaciones del Comité Permanente, que se examinó en la SC67, pero solo en relación con otras tres especies de caballitos de mar: *Hippocampus kelloggi, H. kuda* y *H. spinosissimus*. La comunicación se somete ahora nuevamente a examen en relación con *H. trimaculatus*. Se señala que muchas de las acciones y actividades sobre las que se informa se referían a todas las especies de *Hippocampus* y por lo tanto también son pertinentes en relación con *H. trimaculatus*. La comunicación incluye una nota del 29 de junio de 2016 en la que Tailandia presentó información actualizada acerca de su programa se seguimiento de los caballitos de mar, que había comenzado en 2016. No obstante, aparentemente, no se recolectó *Hippocampus trimaculatus* durante el estudio realizado en 2016. La nota señala además que Tailandia está trabajando actualmente con el Proyecto Seahorse para desarrollar modelos de población de los caballitos de mar en respuesta a la presión de la explotación, usando un modelo basado en la edad, y que los conocimientos existentes acerca del ciclo vital de *H. trimaculatus* se han incorporado y tenido en cuenta en este estudio. No se ha presentado información actualizada sobre los progresos realizados en el estudio desde entonces. Tailandia también informó de que el Departamento de Pesca ha elaborado un plan de trabajo para que 10 Centros de Investigación y Desarrollo de Pesca Costera establezcan criaderos y proporcionen alrededor de 100.000 individuos de caballitos de mar anualmente, lo que prevé que reducirá la presión sobre la población silvestre y promoverá la acuicultura de caballitos de mar. No se facilitaron otros detalles.	<u>Conclusión de la Secretaría y el Comité de Fauna en relación con la aplicación de las recomendaciones</u> Las recomendaciones d) a g) se han aplicado parcialmente. <u>Medidas recomendadas por la Secretaría</u> **Se invita al Comité Permanente a:** **i) suprimir *Hippocampus trimaculatus* del Examen del comercio significativo, sujeto a la confirmación de Tailandia de que la suspensión de las exportaciones de todas las especies de *Hippocampus* spp. permanece en vigor, e** **ii) instar a Tailandia a informar a la Secretaría y a la Presidencia del Comité de Fauna acerca de sobre cualquier cambio en la suspensión del comercio de *H. trimaculatus*, junto con una justificación, para obtener su aprobación.**

e) elaborar y aplicar medidas de control adecuadas y realizar inspecciones para mejorar la aplicación de la prohibición comunicada de la pesca de arrastre a 3-5 km de la costa, como principal medio de reducir la captura incidental de *H. trimaculatus;* En un plazo de 2 años (para el 2 de junio de 2016) la Autoridad Administrativa debe: f) establecer un programa de vigilancia detallado de los desembarques de *H. trimaculatus* en lugares representativos, teniendo en cuenta los distintos tipos de artes de pesca y medios de extracción y el registro de métricas de captura y esfuerzo, y presentar un informe a la Secretaría; g) aplicar medidas adicionales, con inclusión de restricciones espaciales y/o temporales de las actividades pesqueras, para apoyar los dictámenes de extracción no perjudicial, de conformidad con los puntos 2.a) y 3 del Artículo IV. *En la SC66, el Comité Permanente felicitó a Tailandia por los progresos realizados en la aplicación de las recomendaciones a), b) y c) del Comité de Fauna, señalando sin embargo que no se había dado cumplimiento a las recomendaciones d) y e) en los plazos previstos. Se solicitó a Tailandia que finalizara la aplicación de las recomendaciones d), e), f) y g) antes del 2 de junio de 2016.*	En la comunicación que Tailandia presentó a la SC67 se afirmaba que había establecido programas de gestión adaptable para que pueden prevenir eficientemente el deterioro de los recursos de caballitos de mar causado por las actividades pesqueras, facilitar el seguimiento del comercio de *Hippocampus* spp. y permitir el examen de las medidas de gestión pertinentes para garantizar que el comercio no sea perjudicial para la supervivencia de los caballitos de mar en el medio silvestre. Con relación a la recomendación d): Tailandia hizo referencia a los resultados del proyecto de investigación que se presentó a la SC67, con información general sobre los caballitos de mar (*Hippocampus* spp.), aunque no específica sobre *H. trimaculatus*. Este presenta los resultados preliminares de estudios de campo y entrevistas, así como incluye mapas de distribución. Los estudios siguen en curso. Con relación a la recomendación e): Tailandia informa de que el Departamento de Pesca ha elaborado un nuevo plan de ordenación pesquera, que facilita la adopción de medidas de vigilancia más eficaces; por ejemplo, inspección de los buques pesqueros a la entrada y la salida del puerto, aplicación de un sistema de localización de buques y mejora de la coordinación entre los buques patrulla y las comunidades locales. También se establecieron medidas para limitar la capacidad de pesca, y se estima que se desplazarían 2.051 buques arrastreros y de rastrillo sin licencia. Además, también se prohibió estrictamente la entrada de buques pesqueros de 30 toneladas brutas y más en las zonas prohibidas del Golfo de Tailandia y el mar de Andaman durante la veda estacional por medio de la aplicación del sistema de localización de buques, lo que ayuda a garantizar la aplicación y el cumplimiento efectivos de las medidas de conservación y gestión de los caballitos de mar. Además, el Ministerio de Agricultura y Cooperativas publicó una notificación sobre la restricción de aparejos de alta mar, métodos de pesca y zonas de pesca prohibida para 2016.	

	Con relación a la recomendación f): Tailandia afirma que ha aplicado el proyecto para hacer un seguimiento de las capturas de caballitos de mar, la composición de la especie y la distribución en función de la longitud y la frecuencia por medio de lo siguiente: i) recopilación de datos de arrastreros de investigación: se recopilaron datos cuatro veces por año en 63 sitios de muestreo en el Golfo de Tailandia y 22 sitios en el mar de Andaman; ii) recopilación de datos de relevamientos de desembarque; se recopilaron datos anualmente de: a) pesca de arrastre y con trampas y redes de enmalle; y b) comerciantes de primer nivel para determinar los cambios en el comercio. Con relación a la recomendación g): El Gobierno de Tailandia ha respaldado la nueva Ordenanza Real sobre la Pesca (noviembre de 2015) con la finalidad principal de reformar la Ley de pesca vigente en el país y de facilitar la implementación de medidas para combatir la pesca ilegal, no declarada y no reglamentada (INDNR). También se publicaron varias políticas y reglamentos nuevos respecto a los arrastreros. Además, del Departamento de Pesca de Tailandia elaboró un nuevo Plan de ordenación de la pesca marina, que establece las acciones y medidas necesarias, especialmente para reemplazar la pesca de "acceso abierto" por pesca de "acceso limitado" a fin de equilibrar el nivel de esfuerzo de pesca y los recursos pesqueros disponibles en función del máximo rendimiento sostenible (MRS) (véase el Anexo 5 de este documento). Para resumir, resulta claro que Tailandia ha introducido varias medidas y mejoras en sus políticas sobre la pesca y la ordenación de la pesca en relación con los caballitos de mar en general, pero no resulta claro qué medidas se han tomado específicamente en relación con *Hippocampus trimaculatus.*	

	No obstante, en lo que respecta al comercio de *Hippocampus kelloggi, H. kuda* y *H. spinosissimus* de Tailandia, la 67ª reunión del Comité Permanente recomendó que se excluyera a Tailandia del proceso de Examen del comercio significativo para estas tres especies de caballitos de mar. El Comité Permanente reconoció que Tailandia había suspendido la exportación de especímenes de *Hippocampus* spp. desde el 1 de enero de 2016 hasta próximo aviso, y recomendó que Tailandia informase a la Secretaría y a la Presidencia del Comité de Fauna sobre cualquier cambio en la suspensión del comercio de *H. kellogi, H. kuda* y *H. spinosissimus*, junto con una justificación, para obtener su aprobación. Dado que esta suspensión abarca todas las especies de *Hippocampus*, también se aplicaría a *Hippocampus trimaculatus.*	
***Chamaeleo gracilis* (Camaleón grácil)**		
Togo (TG) (Urgente preocupación) En un plazo de 90 días (para el 31 de agosto de 2014) la Autoridad Administrativa debe: a) proporcionar a la Secretaría la información disponible sobre el estado, la distribución y la abundancia de *C. gracilis* en TG; b) informar a la Secretaría de que TG mantendrá un cupo de exportación anual a un nivel que no sea superior al cupo de exportación publicado actualmente; c) proporcionar información sobre la gestión de los animales criados en granjas (p.ej., instalaciones de cría en granjas, inclusive el número del plantel, las fuentes, los niveles de producción, la tasa de supervivencia de las hembras utilizadas en el establecimiento de cría en granjas) y detalles de los impactos sobre las poblaciones silvestres; d) justificar, y facilitar detalles de, la base científica por la que se han establecido los cupos de exportación actuales de x animales vivos (origen W) y de x animales vivos (origen R) y se ha determinado que no serían perjudiciales para la	TG presentó información parcial en relación con las recomendaciones del Comité de Fauna. Esta información fue examinada en la SC67. Togo no ha proporcionado información nueva desde la fecha de esa reunión. *Con relación a la recomendación a):* El estudio presentado por TG proporciona información parcial en relación con esta recomendación. Indica que *C. gracilis* es fundamentalmente una especie de la sabana. También se presenta en los bordes de las zonas forestales, pero no penetra los bosques ribereños. La especie presenta una muy alta distribución a nivel nacional. En la estación húmeda, se encuentran muchos individuos en los caminos principales del país, donde usualmente son embestidos por vehículos. La especie se captura en las zonas de Notsé, Assrama, Tététou, Tomety-Kondji, Kpele y otras. Aparentemente, se presenta especialmente en los bosques de galería. El estudio indica además que los trabajos actuales no	Conclusión de la Secretaría y el Comité de Fauna en relación con la aplicación de las recomendaciones La recomendación del Comité Permanente de que Togo establezca cupos se ha cumplido en parte. Se ha cumplido la recomendación b), aunque se señala que esto se debería haber hecho en tándem con la recomendación f). Las recomendaciones a) y c) se han cumplido aún solo parcialmente. No se ha dado cumplimiento a las recomendaciones d), e), f), g), h) y i) del Comité de Fauna. Medidas recomendadas por la Secretaría **Se invita al Comité Permanente a:**

supervivencia de la especie en el medio silvestre y estaban en conformidad con los párrafos 2 a) y 3 del Artículo IV; e) proporcionar información detallada a la Secretaría sobre las medidas de control utilizadas para diferenciar entre los especímenes criados en granjas y los capturados en el medio silvestre para garantizar que las exportaciones autorizadas de especímenes criados en granjas no se aumenten con especímenes silvestres declarados indebidamente; y f) como medida cautelar, imponer una restricción del tamaño con una longitud máxima desde el hocico hasta la abertura cloacal de 8 cm para los especímenes vivos de código de origen R que vayan a exportarse y que debería publicarse con el cupo de exportación anual. En un plazo de 2 años (para el 2 de junio de 2016) la Autoridad Administrativa debe: g) realizar una evaluación nacional sobre el estado de la especie, incluyendo una evaluación de las amenazas para la especie; e informar a la Secretaría de cualquier medida de gestión en vigor (destacando cuando se han introducido nuevas medidas de gestión para tener en cuenta cualquier nueva información disponible sobre el estado de la especie en TG); h) establecer cupos de exportación anual revisados (según proceda) para especímenes capturados en el medio silvestre y criados en granjas, a tenor de los resultados de la evaluación; y i i) justificar, y facilitar detalles de, la base científica por la que se ha determinado que esos cupos revisados no serían perjudiciales para la supervivencia de la especie en el medio silvestre y estaban en conformidad con los párrafos 2 a) y 3 del Artículo IV. *La SC66 recomendó que se suspendiera el comercio de* C. gracilis *de TG hasta que el país hubiera demostrado que cumplía con los párrafos 2 a) y 3 del Artículo IV para esta especie, y presentara a la Secretaría información detallada*	proporcionan datos sobre el tamaño de la población de la especie. Se indica que el estado de la población de la especie es relativamente estable en TG. <u>*Con relación a la recomendación b):*</u> TG informó a la Secretaría un cupo para 2016 de 500 especímenes de origen silvestre y 2.500 especímenes criados en granjas. Se publicaron los mismos cupos para 2017 (de conformidad con las instrucciones de la SC67). No obstante, no se solicitó la restricción de tamaño recomendada en la recomendación f). <u>*Con relación a la recomendación c):*</u> El estudio contiene información parcial acerca de seis establecimientos de cría en granjas seleccionados. No incluye detalles acera de los efectos de la cría en granjas en la población silvestre. Se indica que los establecimientos de cría en granjas capturan ejemplares de hembras silvestres gestantes que, después de que ponen sus huevos, son liberadas dentro de las zonas de captura. <u>*Con relación a la recomendación d):*</u> El estudio no contiene información al respecto. <u>*Con relación a la recomendación e):*</u> El estudio no contiene información al respecto. <u>*Con relación a la recomendación f):*</u> La información que figura en el estudio no resulta clara. Se afirma que, para las exportaciones a Europa, la longitud máxima actual es de 6 cm. En otras secciones, también se indica que la medida cautelar propuesta, de 8 cm, está adecuadamente justificada, y se recomienda modificar la longitud máxima a 10 cm. <u>*Con relación a la recomendación g):*</u> Esta recomendación no ha sido aplicada. El estudio recomienda hacer un inventario de la población nacional de la especie para fundamentar el establecimiento de los	**i) solicitar a Togo que establezca un cupo nulo para los especímenes de *C. gracilis* de origen silvestre y criados en granjas, e** **ii) instar a Togo a que aplique las recomendaciones a), c), d), e), f), g), h) y i) del Comité de Fauna antes del 27 de abril de 2018.**

sobre el cumplimiento de las recomendaciones del Comité de Fauna. *En la SC67, el Comité Permanente solicitó a Togo que establezca para 2017 cupos de exportación para* C. gracilis *de 2.500 especímenes vivos criados en granjas y 500 especímenes vivos de origen silvestre; e instó a Togo a aplicar las recomendaciones d) a i) antes del 2 de junio de 2017 (véase el Anexo 1 del documento SC67 Doc. 15).*	cupos anuales de manera más racional. Se indica que en ese ejercicio se deberían proponer nuevas zonas de captura. <u>*Con relación a la recomendación h)*</u>*:* Esta recomendación no ha sido aplicada. <u>*Con relación a la recomendación i):*</u> Esta recomendación no ha sido aplicada.	
***Kinixys homeana* (Tortuga angular)**		
Togo (TG) (Posible preocupación) Para el plazo de 90 días (para el 31 de agosto de 2014) la Autoridad Administrativa debería proporcionar la siguiente información a la Secretaría, para que la transmita a la consideración del Comité de Fauna en su 28 a reunión: a) la información disponible sobre el estado, la distribución (incluido el grado de distribución en zonas protegidas) y la abundancia de *K. homeana* en TG; b) la confirmación de que TG mantendrá un cupo de exportación a un nivel no superior al cupo de exportación publicado actualmente; c) una justificación, y los detalles, de la base científica por la que se ha establecido que las cantidades de *K. homeana* exportadas como especímenes silvestres y criados en granjas no son perjudiciales para la supervivencia de la especie y están en conformidad con los párrafos 2 a) y 3 del Artículo lV; d) la gestión de los animales criados en granjas en el comercio (por ejemplo, instalaciones de cría en granja, cantidades de población, fuentes, niveles de producción, tasa de supervivencia de los especímenes hembras utilizados en el establecimiento de cría) y sobre las poblaciones silvestres; e) las medidas de control para diferenciar especímenes criados en granjas, producidos en cautividad y capturados en el medio silvestre, a fin de garantizar que las exportaciones autorizadas de especímenes criados en	TG presentó información parcial en relación con las recomendaciones del Comité de Fauna. Esta información fue examinada en la SC67. Togo no ha proporcionado información nueva desde esa fecha. <u>*Con relación a la recomendación a)*</u>*:* En el estudio presentado por TG se indica que el área de distribución actual de *K. homeana* es la zona forestal entre Togo y Ghana. Los lugares donde actualmente se capturan especímenes vivos son Badou Tomegbe, Akloa, Kpélé Elé, Kpadapé y Hanyigban, entre otras. Es probable encontrar esta especie en las áreas protegidas de Assoukoko y Fazao Malfakassa. Las investigaciones recientes indican la presencia de la especie en el Parque Nacional Togodo. Se dice que las poblaciones de la especie en toda su área de distribución están seriamente amenazadas y que ahora es una especie rara en TG. Sin embargo, el estudio indica que, en otros lugares, es común a lo largo de los arroyos de las zonas forestales. <u>*Con relación a la recomendación b)*</u>*:* TG informó a la Secretaría un cupo para 2016 de 500 especímenes de origen silvestre y 2.000 especímenes criados en granjas, igual al de años anteriores. El informe recomienda además reducir este cupo en el futuro a ningún espécimen de origen silvestres y 400 especímenes criados en granjas. Togo estableció para 2017 cupos de exportación de *Kinixys homeana* de	<u>Conclusión de la Secretaría y el Comité de Fauna en relación con la aplicación de las recomendaciones</u> La recomendación del Comité Permanente de que Togo establezca cupos se ha cumplido en parte. La recomendación d) se ha cumplido parcialmente. No se ha dado cumplimiento a las recomendaciones c), e), f), g) y h) del Comité de Fauna dentro de los plazos prorrogados. <u>Medidas recomendadas por la Secretaría</u> **Se invita al Comité Permanente a:** **i) solicitar a Togo que establezca un cupo nulo para los especímenes de *K. homeana* de origen silvestre y criados en granjas.** **ii) instar a Togo a que aplique las recomendaciones c), d), e), f), g) y h) del Comité de Fauna antes del 27 de abril de 2018.**

granjas y producidos en cautividad no aumenten debido a los especímenes silvestres declarados engañosamente. En el plazo de dos años, la Autoridad Administrativa debe: f) realizar una evaluación nacional sobre el estado de la especie, incluyendo una evaluación de las amenazas para la especie; e informar a la Secretaría de cualquier medida de gestión en vigor (destacando cuando se han introducido nuevas medidas de gestión para tener en cuenta cualquier nueva información disponible sobre el estado de la especie en TG); g) establecer cupos de exportación anual revisados (según proceda) para especímenes capturados en el medio silvestre y criados en granjas, a tenor de los resultados de la evaluación; y h) proporcionar una justificación, y una explicación, de la base científica por la que se ha determinado que esos cupos no serían perjudiciales para la supervivencia de la especie en el medio silvestre y se han establecido en conformidad con los párrafos 2 a) y 3 del Artículo IV. *En la SC67, el Comité Permanente solicitó a Togo que establezca para 2017 cupos de exportación para* K. homeana *de 400 especímenes vivos criados en granjas con un tamaño límite inferior a 10 centímetros y ningún espécimen de origen silvestre; e instó a Togo a aplicar las recomendaciones c) a h) antes del 2 de junio de 2017 (véase el Anexo 1 del documento SC67 Doc. 15).*	400 especímenes vivos criados en granjas y ningún espécimen vivo de origen silvestre. Estos cupos se publicaron el 6 de marzo de 2017. No obstante, Togo no solicitó que se publicase la restricción de tamaño para los especímenes criados en granjas junto con el cupo. *Con relación a la recomendación c):* El estudio no contiene información sobre este asunto. *Con relación a la recomendación d):* El estudio contiene información parcial acerca de seis establecimientos de cría en granjas seleccionados. El estudio no incluye detalles acera de los efectos de la cría en granjas en la población silvestre. *Con relación a la recomendación e):* El informe no contiene información al respecto. *Con relación a la recomendación f):* Esta recomendación no ha sido aplicada. El estudio recomienda hacer un inventario de la población nacional de la especie para determinar el tamaño de la población y evaluar si se puede comercializar. *Con relación a la recomendación g):* Esta recomendación no ha sido aplicada. *Con relación a la recomendación h):* Esta recomendación no ha sido aplicada.	

Observaciones del Comité de Fauna acerca de las combinaciones de especies/Estados del área de distribución

Con relación a *Hippopotamus amphibius* de Mozambique

El Comité de Fauna es de la opinión de que la repuesta de Mozambique aborda adecuadamente las preguntas formuladas por el Comité de Fauna en lo que respecta al Examen del comercio significativo. Por lo tanto, recomienda a la SC69 que levante la suspensión del comercio y suprima la combinación de especie/país del proceso del Examen. Felicita a Mozambique por su informe y desea añadir algunas observaciones más detalladas.

- La extracción de hasta 80 animales en una población estimada de más de 8.000 animales se puede considerar no perjudicial para la supervivencia de la especie, especialmente considerando que la extracción se limita a las poblaciones más sólidas del país.

- El futuro seguimiento de la población con relevamientos regulares garantizará que se cree un plan de gestión adaptable.

- Además, los 80 animales eran la suma de 40 animales como trofeo de caza y la eliminación de otros 40 animales problemáticos, por lo que se garantiza que no se extraigan más de 80 animales de las poblaciones.

- El Comité de Fauna considera que la coordinación entre estos dos tipos de extracción (caza de trofeos y eliminación de animales problemáticos) debería estar bien gestionada e integrarse en un plan de gestión futuro.

- El Comité de Fauna desea que se le mantenga actualizado respecto a los progresos logrados por Mozambique a fin de mostrar este caso como un buen ejemplo de gestión de las especies, e invita a Mozambique a presentar su plan de gestión, una vez que se establezca, en futuras reuniones del Comité de Fauna.

Con relación a *Pandinus imperator* de Togo

El Comité de Fauna es de la opinión de que la repuesta de Togo no aborda adecuadamente las preguntas formuladas por el Comité de Fauna en lo que respecta al Examen del comercio significativo de esta especie. Por lo tanto, recomienda a la SC69 que mantenga la suspensión del comercio para esta especie y que la mantenga en el Examen del comercio significativo. Desea formular las siguientes observaciones a fin de que Togo aborde con mayor precisión las preocupaciones del Comité de Fauna:

- El estudio presentado no muestra esfuerzos de Todo por demostrar que *Pandinus imperator* se puede considerar una especie común y que, por lo tanto, el cupo de exportación de 20.000 animales se podría considerar sostenible. Además, intenta demostrar la capacidad de los procedimientos de cría en granjas para producir una gran cantidad de los animales que se exportarán. No obstante, en relación con estas opiniones, el Comité de Fauna desea formular a Togo las observaciones y recomendaciones siguientes:

    i) El estudio de la población en tierras de barbecho demuestra una densidad relativamente alta de la especie. No obstante, no se incluye una extrapolación de los números de animales detectados para estimar la población total comparando la presencia de ese tipo de hábitat y el área de distribución de la especie. Además, no hay datos sobre las densidades de la especie en los diferentes tipos de hábitat y sobre la disponibilidad de ese hábitat adecuado y posiblemente no habitado por la especie. La combinación de esta información permitiría estimar la posible población para la captura.

    ii) Además, el tipo de captura descrito en el estudio (es decir, la extracción de todos los especímenes de la zona hasta que no se encuentren otros antes de avanzar a otra zona) se considera un tipo de captura perjudicial, en particular si se deben desenterrar los animales y se destruye una gran proporción de las madrigueras necesarias para la supervivencia de la especie. La captura debería realizarse en una proporción limitada de las poblaciones, en forma rotativa, a fin de que el efecto en la población no sea perjudicial.

iii) En lo que respecta al procedimiento de cría en granjas, en Comité de Fauna es de la opinión de que el estudio no muestra de manera convincente que la captura esté en consonancia con el uso correcto del código de origen R. Los establecimientos indicados en el estudio y la cantidad de animales observados en estos establecimientos, combinado con el período prolongado que se requiere para obtener crías que puedan exportarse, plantea dudas acerca de si las cantidades que se sostiene que se producen en este programa de cría en granjas pueden provenir de estos establecimientos.

- En general, el Comité de Fauna es de la opinión de que todos los animales exportados de Togo parecen ajustarse al código de origen W y un DENP apropiado para la especie debería abordar las preocupaciones que indicadas en los párrafos anteriores.

Con relación a *Python reticulatus* de Malasia

El Comité de Fauna es de la opinión de que la repuesta de Malasia aborda adecuadamente las preguntas formuladas por el Comité de Fauna en lo que respecta al Examen del comercio significativo. Por lo tanto, recomienda a la SC69 que suprima la combinación de especie/país del proceso del Examen. Felicita a Malasia por su informe e invita a Malasia a que mantenga al Comité de Fauna informado acerca de sus niveles de captura en una futura reunión del Comité de Fauna, a fin de mantener al Comité actualizado acerca de los progresos realizados y mostrar este caso como un buen ejemplo.

Con relación a *Chamaeleo gracilis* de Togo

El Comité de Fauna es de la opinión de que la repuesta de Togo no aborda adecuadamente las preguntas formuladas por el Comité de Fauna en lo que respecta al Examen del comercio significativo de esta especie. Togo no ha demostrado de manera convincente que la captura o la cría en granjas de esta especie sean sostenibles. Por lo tanto, recomienda a la SC69 que la mantenga en el Examen del comercio significativo. Desea formular las siguientes observaciones a fin de que Togo aborde con mayor precisión las preocupaciones del Comité de Fauna:

En particular, siguen existiendo interrogantes acerca de los aspectos siguientes:

- Los datos recopilados acerca de la abundancia y las densidades de *C. gracilis* deben elaborarse más detalladamente. Por ejemplo, a fin de obtener una estimación aproximada de la población total de la especie, las cifras que se obtuvieron de los estudios de transectos deberían evaluar en relación con la zona del hábitat adecuado o que ocupa actualmente la especie. Además, debería presentarse una comparación de las densidades en diferentes hábitats, lo que permitiría perfeccionar esta estimación.
- Se afirma que la población es estable; no obstante, deberían incluirse datos para apoyar esta afirmación.
- Debe incluirse una comparación entre las zonas en las que no se realiza ninguna captura con aquellas donde se capturan especímenes. Esto permitiría confirmar, como se afirma repetidas veces en el informe, que la captura no tiene efectos negativos en las poblaciones.
- El método de captura no se aplica actualmente en forma rotativa, lo que daría tiempo para que las zonas se recuperen. Deberían tenerse en cuenta la biología y, en particular, los detalles del reclutamiento.
- Se debe explicar de qué manera los establecimientos mantienen los especímenes capturados en el medio silvestre separados de los especímenes criados en granjas.
- También deben explicarse las operaciones de cría en granjas. Si, como se describe en el documento que se presentó en la SC67, los animales son distribuidos por varios intermediarios en los establecimientos de cría según las necesidades de los establecimientos, existen dudas acerca de cómo se hace un seguimiento de los animales individuales a fin de volverlos a colocar en el lugar de donde se los capturó.
- Es necesario explicar las discrepancias entre los números de animales que hay en los establecimientos y los números que se sostiene que se producen en ellos, lo que plantea dudas acerca de la afirmación de que la especie se cría en granjas.

Con relación a *Kinixys homeana* de Togo

El Comité de Fauna es de la opinión de que la repuesta de Togo no aborda adecuadamente las preguntas formuladas por el Comité de Fauna en lo que respecta al Examen del comercio significativo de esta especie. Togo no ha demostrado de manera convincente que la captura o la cría en granjas de esta especie sean

sostenibles. Por lo tanto, recomienda a la SC69 que la mantenga en el Examen del comercio significativo. Desea formular las siguientes observaciones a fin de que Togo aborde con mayor precisión las preocupaciones del Comité de Fauna:

- Se debe explicar la gestión de las existencias para cría en granjas, incluyendo de qué manera se garantiza que se impida el blanqueo de animales capturados en el medio silvestre a través del establecimiento, si las existencias de los establecimientos de cría se complementan con especímenes silvestres y, en ese caso, cómo se garantiza la sostenibilidad.
- Se debe explicar cómo se pueden producir 400 especímenes con los números de animales observados en los establecimientos, en especial considerando la baja fecundidad de la especie (5 huevos por hembra como máximo).
- Cabe señalar que la longitud del caparazón generalmente se toma como la longitud del caparazón “en línea recta”, medida con calibres (solamente las tortugas marinas se miden “sobre la curva” con una cinta medidora).
- El informe formula una serie de recomendaciones, pero no resulta claro si estas recomendaciones han sido aplicadas por Togo.
- El Comité de Fauna recomienda que Togo, a fin de obtener orientación más clara sobre la formulación de DENP para las tortugas, consulte el contenido del documento AC28 Doc. 15 Anexo 2. *Dictámenes de extracción no perjudicial y gestión del comercio de las tortugas terrestres y galápagos - Guía para la Autoridad Científica y la Autoridad Administrativa de la CITES.*

Problemas identificados por los Comités de Fauna y de Flora que no están relacionados con la aplicación de los párrafos 2 a), 3 o 6 a) del Artículo IV.

A. Los dos casos siguientes fueron identificados en el proceso del Examen del comercio significativo en la 29ª reunión del Comité de Fauna (AC29) y remitidos al Comité Permanente para que los examine en su 69ª reunión (SC69):

1. *Uromastyx aegyptia*/Jordania

El Comité de Fauna tomó nota de que se había notificado comercio ilegal de *Uromastyx aegyptia* a partir de Jordania.

2. *Triceros montium/*Guinea Ecuatorial

Durante los debates sobre el comercio de *Trioceros montium*, una especie endémica de Camerún, como se identifica en el Cuadro 3 del Anexo 1 al documento AC29 Doc. 13.2, el Comité de Fauna tomó nota de las exportaciones de especímenes silvestres de Guinea Ecuatorial, que no es Estado del áreas de distribución de esta especie.

B. Los dos casos siguientes fueron identificados en el proceso del Examen del comercio significativo en la 23ª reunión del Comité de Flora (PC23) y remitidos al Comité Permanente para que los examine en su 69ª reunión (SC69):

1. *Dendrobium chrysotoxum, D. moschatum*/República Democrática Popular Lao

El Comité de Flora toma nota de que pese a que no se ha declarado recientemente comercio legal CITES de especímenes silvestres de *Dendrobium chrysotoxum* y *Dendrobium moschatum* de la República Democrática Popular Lao, los estudios de campo indican que continúa un comercio internacional a gran escala no comunicado de especies *Dendrobium* de ese país, inclusive de *Dendrobium chrysotoxum*. Esto no concuerda con el cambio repentino comunicado en el comercio de especies de origen silvestre por especímenes reproducidos artificialmente, señalando que el cultivo de esas especies es difícil. El Comité de Flora igualmente considera el proceso en curso del Comité Permanente para este país.

REPÚBLICA DE MOÇAMBIQUE

MINISTÉRIO DA TERRA, AMBIENTE E DESENVOLVIMENTO RURAL (MITADER)

NATIONAL ADMINISTRATION FOR CONSERVATION AREAS (ANAC)

ANAC
ADMINISTRAÇÃO NACIONAL DAS ÁREAS DE CONSERVAÇÃO

UNIVERSIDADE EDUARDO MONDLANE

Status, Management and Non-Detriment Finding for *Hippopotamus amphibius* (Common Hippopotamus) in Mozambique.

Prepared under the Mozambique Conservation Areas for Biodiversity and Sustainable Development project (MOZBIO) sub-component 2.2

Maputo, April 2017

Background on CITES Review of Significant Trade (RST) for Hippo in Mozambique

1. Since 2008, the Convention on International Trade in Endangered Species of Wild Fauna and Fauna (CITES) initiated a process under the Review of Significant Trade (RST) as delineated in Resolution Conf.12.8 (now revised at CoP17). At the 23rd Meeting of the CITES Animals Committee (AC23 April 2008) *Hippopotamus amphibius* was included in the RST due to alleged declining populations and increasing trade (AC23 WG1 Doc. 1). All 23 range States, including Mozambique, were retained in the RST at AC24 (AC24 Summary Record).

2. In July 2011 at AC25 (AC25 Summary Record), *Hippopotamus amphibius* was categorised as of "possible concern" for Mozambique on the following basis: *"Widespread and locally abundant with an estimated population size of 18,000 individuals, however whilst stable/increasing in a few areas, thought to be declining overall. Poaching and drought are the main threats. High levels of trade, with consistent exports of 50-90 trophies annually in recent years. Occurs in a number of protected areas yet level of protection unknown and management measures including a detailed basis for non-detriment findings are unknown. On this basis, categorised as Possible Concern" (AC25 Doc.9.4 Annex).* The following recommendations were formulated:

   a) Provide an explanation of the 'internal system of annual quotas' and other management measures in place and clarify the perceived discrepancies between reported Customs data (imports) and CITES data (exports) referred to in document AC25 Doc. 9.4;

   b) Provide information derived from the national survey undertaken in 2008 on the distribution, abundance and conservation status of H. amphibius in Mozambique, including details of methodologies employed; and

   c) Provide justification for, and details of, the scientific basis by which, it has been established that the quantities of H. amphibius exported were not detrimental to the survival of the species and in compliance with Article IV, paragraphs 2 (a) and 3.

3. At the 62nd Meeting of the Standing Committee (SC), as no response was received from Mozambique, the Secretariat and AC Chair determined that recommendations had not been complied with (SC62 Doc.27.1). The SC agreed to suspend trade for *Hippopotamus amphibius* from two range States including Mozambique (SC62 Summary Record). The suspension entered into force on 7 September 2012 (Notification to the Parties No. 2012/057). In January 2016, at CITES SC66 (SC66 Summary Record), Mozambique informed the SC that it was undertaking research on *Hippopotamus amphibius* status and management in the country in response to the Significant Trade recommendations, and that it would share the results with the Secretariat and the Standing Committee when concluded.

Summary of Findings

4. The Common Hippopotamus (*Hippopotamus amphibius)* - hereafter referred to as Hippo - was included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) at the Ninth meeting of the Conference of the Parties (Fort Lauderdale (USA), November 1994) (CITES,1994). In terms of Article IV of the Convention, an export permit shall only be granted for an Appendix II species when a Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of that species.

5. Mozambique has used export quotas, as also recommended in Resolution Conf. 14.7 (Rev. CoP15) on "Management of nationally established quotas", to effectively meet the requirement of Article IV of CITES and to ensure that the species is maintained throughout its range at a level consistent with its role in the ecosystems.

6. In Resolution Conf. 14.7 (Rev. CoP15) the CITES Parties recognized the linkage between export quotas and Non-detriment findings (NDFs) and adopted guidelines to manage these quotas. In particular, they agreed that an export quota system is a management tool, used to ensure that exports of specimens of a certain species are maintained at a level that has no detrimental effect on the population of the species. The setting of an export quota effectively meets the requirement of CITES to make an NDF for species included in Appendix I or II and, for species in Appendix II, to ensure that the species is maintained throughout its range at a level consistent with its role in the ecosystems in which it occurs.

7. The present document fully responds to the CITES Standing Committee recommendations and details the undertaking of a non-detriment finding (NDF) assessment (Figure 1 and Table 1) for the Hippo in

Mozambique in accordance with the CITES NDF checklist available at : https://www.cites.org/sites/default/files/eng/cop/11/info/03.pdf and with Resolution Conf.16.7 (Rev.CoP17). It is based on the best currently available information, as of April 2017. It also contains information on the proposed management regime that will be adaptively implemented and overall on the status of the species in the country.

8. The biological characteristics of the species do not render it at a high risk to over-harvesting (Figure 1). Hippos are generally tolerant of human activities and are regarded as a pest species outside of protected areas, particularly in communal areas. Although restricted to areas in proximity of water, individuals disperse efficiently between water sources. The species is reasonably adaptable to different environments and hippos are known to forage in agricultural lands.

9. A hippo-focused aerial survey, initiated by the Mozambique's National Administration for Conservation Areas (ANAC) as part of the MOZBIO (World Bank) project, was carried out between 20 November and 4 December 2016 (BassAir 2017). The results of this survey estimated around 7300 individuals (6497 hippos observed adjusted to 6742 applying the corrections factors suggested by Mackie et al 2012) in the surveyed areas across Mozambique. For the sake of consistency, the same areas surveyed by Mackie et al 2012 were surveyed. As some areas were only partially surveyed, data from aerial surveys undertaken in the same year, 2016, in Gorongosa National Park, and Sabie Game Park (Corumana Dam), have been added to the total and data from the Maputo Special Reserve have been adjusted in line with the total count of wildlife in the Reserve. However, some areas remain to be surveyed specifically for hippos especially in the Zambezi Delta comprising the Marromeu area and adjacent Coutadas along the Zambezi River. The minimum population of hippo estimated in Mozambique is likely greater than 8,000 individuals.

10. Although the species is categorized as Vulnerable by the IUCN Red List (Lewison, R. & Oliver, W. 2008), the IUCN Red List assessment is now in need of a review on the status of the species in Mozambique based on the information contained in the present document. The same is true for the UNEP-WCMC review as presented at CITES SC66 (SC66 Doc.31.2 Annex 2) as both documents contain outdated information on the status of the species in Mozambique as well as other inaccuracies that are detailed in the present document. The quality of information for the species in Mozambique is now nearly optimal thanks also to the 2016 specialized Hippo survey (Bass Air 2017.

11. The major threats to the hippo populations in Mozambique are: habitat modification and conflicts with humans. There are no specific figures on illegal hunting and trade of hippo in Mozambique, which is thought to be very limited, based on ANAC data.

12. Mozambique hunting quota allocation will be limited to the hotspots identified in the 2016 hippo survey and namely along the Rovuma-Lugenda rivers (in Niassa National Reserve), in the Cahora Bassa Dam comprising the hunting blocks in the Tchuma Tchato Community Area and in the Zambezi river. The legal harvest of hippos, which will include harvesting for hunting trophies as well as harvest for problem animal control, is and will be minimal. The harvest regime is aimed at achieving conservation benefits with the partial reinvestment of revenues in conservation activities with benefits for the local communities thereby increasing tolerance for hippos.

13. The methodology for allocating hippo hunting quotas is discussed in detail in the NDF (point 14) following the recommendations provided in the 2016 hippo survey report (BassAir 2017). In particular, it is recommended to set the quota for sport hunting in Mozambique, at a percentage between 0,5% and 0,6% of the populations (limited to adult males) found in the hunting areas (blocks and coutadas) that are within the three major hotspots found in the 2016 hippo survey (BassAir 2017), integrated by other data. The resulting maximum sustainable offtake, recommended as total quota for Mozambique, including also hippo harvested for problem animal control and community quotas, is of 80 individuals and this limited offtake does not represent a threat to the survival of the species. Although hippos can withstand maximum sustainable offtakes at a level close to their population growth rate (Martin & Thomas, 1991), Mozambique's quotas for hippo for the period 2009-2012 were set at a level between 1.27% and 2.07%, of the 2008 population estimate reported by the countrywide survey (AGRECO 2009) that, although it was carried out at a very low sampling intensity (3%), estimated the hippo population at 8388 (CL 3896–12879). This survey was the scientific basis on which hunting quotas were allocated. The current quota allocation is more conservative than the prior quota, and Mozambique's hippo population appears to have remained stable since 2008, taking also into account the geographic limits of the current survey.

14. Data on exports are presented in the NDF and an analysis of the 2012 Annual Report to CITES was

carried out, to ascertain the origin of the abnormal number of skulls reported for that year that would have represented 764 hippos exported. It was discovered that erroneously 12 "skulls" instead of 12 "teeth" were reported and appeared in 66 out of 98 permits issued for 99 hippos in that year. A similar analysis was done for the year 2011 and there were 94 permits issued for 95 hippos. It is crucial to note that 12 teeth are normally exported as a trophy, the 4 canines and the 8 incisors. Therefore 12 teeth represent a hippo. The discrepancies in reporting suggested by the CITES recommendations are probably based on this mistake and recommendations are presented (see point 19 of the NDF).

15. In order to enhance monitoring of harvest, a specific monitoring system is envisaged, with the main aim to obtain data on hippo population dynamics.

Conclusions

16. Since the CITES trade suspension entered into force in late 2012, Mozambique has witnessed a period of substantial legislative and administrative reforms: a new government was formed in 2014 which made some important structural changes which also affected the CITES management authority. Since 2014, all wildlife matters are under the Ministry of Land, Environment and Rural Development (MITADER), and in particular under the National Administration for Conservation Areas (ANAC). New wildlife legislation has been enacted including the recent amendment (2016) to the Conservation law of 2014 which imposes stiffer penalties for illegal use of wildlife and a new decree on CITES has been approved in 2016 which includes the administrative framework for CITES implementation. It is foreseen that Mozambique's CITES legislation will be evaluated as Category 1, i.e. legislation that is believed generally to meet all requirements for effective implementation of CITES as reported during the 17th Meeting of the Conference of the Parties to CITES. (see https://cites.org/sites/default/files/eng/cop/17/WorkingDocs/E-CoP17-22-A3-R1.pdf). There is a positive momentum for conservation of natural resources in Mozambique.

17. Thanks to the financial contribution of the World Bank, the Mozambique Conservation Areas for Biodiversity and Sustainable Development project (MOZBIO) is operational, including the component that began in 2016 to provide technical assistance on CITES and sport hunting administration, a key sector for wildlife conservation in the country. Through MOZBIO, funding was made available to carry out the recent hippo survey. In the past, a lack of funding delayed implementation of the hippo survey.

18. The radar chart below summarizing the NDF assessment (Figure 1) undertaken for *Hippopotamus amphibius* (Common Hippopotamus - Hippo) demonstrates that international trade, which will be limited to sport hunting trophies, poses a low and non-detrimental risk to the species in Mozambique. The weakest area of the non-detriment finding for *Hippopotamus amphibius* relates to the absence of a national management plan for the species. However, ANAC, through funding from MOZBIO is starting the necessary steps to produce a species-specific management plan, that, although not an international requirement, will provide a useful framework approach to the conservation and management of the species. Implementation of a sustainable sport-hunting program has been targeted to provide sustainable funding for wildlife authorities and rural communities in areas where hippo populations are abundant.

19. Finally, we envisage that the Scientific Authority of the importing countries will accept these findings that the exportation of hippo hunting trophy is not detrimental to the survival of the species. If the importing countries have data that indicate otherwise we are ready to discuss that information in a collaborative way.

20. This NDF, made in accordance with Article IV of CITES and with the non-binding guiding principles of CITES Resolution Conf.16.7 (Rev.CoP17) and CITES Resolution Conf. 17.9, concludes that the low level of off-take generated by sport hunting is not detrimental to the survival and the species and the amount of revenues generated by this low level of off-take are of crucial importance for the conservation of the species, particularly because of the benefits provided to local communities. The NDF covers a five-years period (2017-2022) and will be updated earlier if new information will becomes available.

Figure 1: Radar chart summarizing the non-detriment finding assessment for *Hippopotamus amphibius* (Common Hippo) in Table 1, made in accordance with the CITES NDF checklist (https://www.cites.org/sites/default/files/eng/cop/11/info/03.pdf). Higher scores are indicative of higher risks. The limited area shaded in the radar chart demonstrates an overall moderate risk of legal harvest to the species.

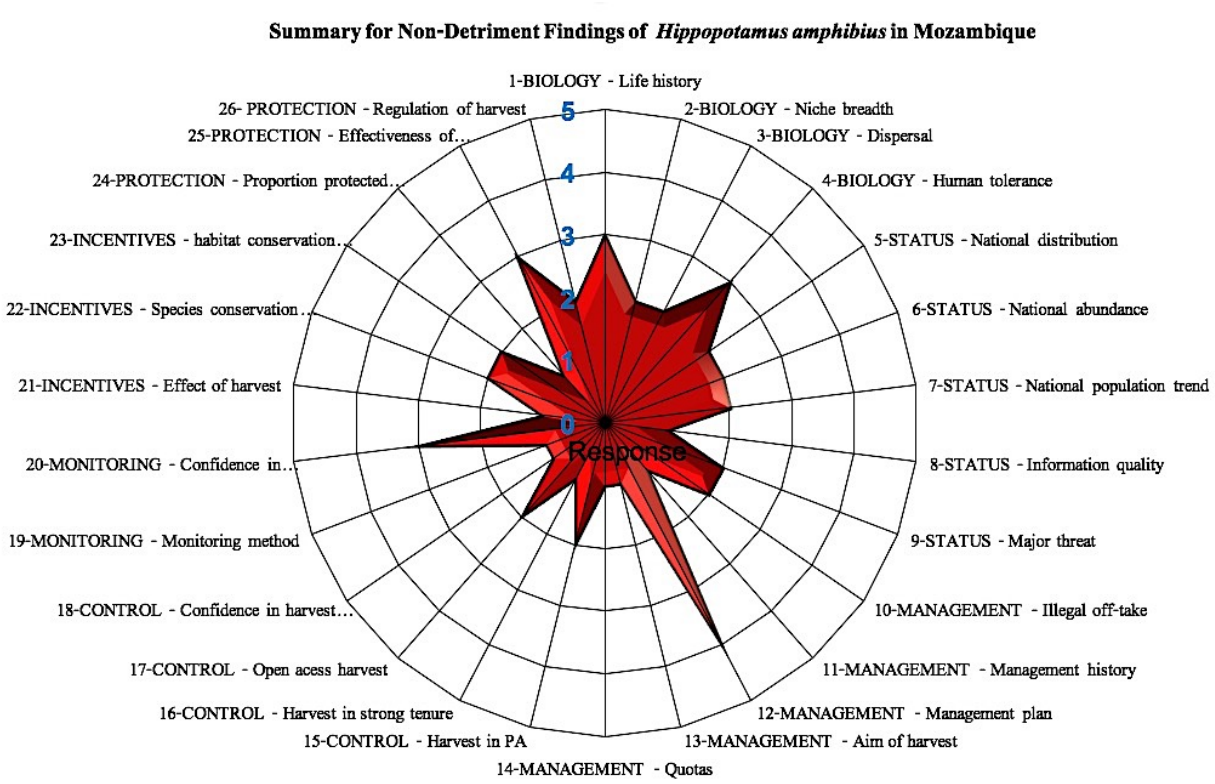


Table 1: Detailed NDF assessment for *Hippopotamus amphibius* (Hippo) conducted in accordance with the CITES NDF checklist available at https://www.cites.org/sites/default/files/eng/cop/11/info/03.pdf . Scores assigned to each question are indicated in bold text along with detailed explanations/justifications where relevant. Higher scores are indicative of higher risks.

Biological characteristics:		
1. Life history: What is the species' life history?	High reproductive rate, long-lived	1
	High reproductive rate, short-lived	2
	Low reproductive rate, long-lived	**3**
	Low reproductive rate, short-lived	4
	Uncertain	5
The common hippopotamus, commonly referred to as hippo, is an unmistakable species, with a barrel-shaped, almost hairless body and short limbs, the males weighing on average 1500 kg and the females 1300 kg (Eltringham 1999) although higher weights are reported (Lewison 2011). Individuals reproduce on average every 2 years with gestation lasting for eight months and lactation lasting for 10-12 months although it can extend to 18 months (Lewison 2011). Hippo typically has an adult *male:female* ratio of 1:1 (Smuts & Whyte, 1981), compared to 1:2 typical of most large mammals. Longevity is reported to be at a maximum of 45 years with a few individuals possibly reaching 48 years (Laws 1968). The intrinsic rate of increase of populations ranges between 8% and 11% (Marshall & Sayer, 1976) and higher rates are recorded with a decrease in the rate of increase as the population approaches carrying capacity (K) (Chomba et al. 2012 and 2014). However, populations sizes can increase and decrease irregularly. In a long-term study in the Luangwa valley (Zambia) the population size and density fluctuated between 5000 (density 29/km) and 7000 individuals (density 42/km) respectively, in 9 irregular cycles of 5 times below K, with each cycle lasting roughly 4 years, and 4 times above K with each cycle lasting roughly 7 years (Chomba et al. 2012 and 2014). Rainfall is assumed to be an important factor in determining the common hippopotamus populations by influencing primary production (grass) and its availability (Lewison 2007, Chansa et al., 2011 and 2012). Smuts & Whyte (1981) describe the reproductive strategy of the hippo as one well adapted to the semi-arid environments of Africa. When resources become limiting, populations remain stable by delayed sexual maturity and fecundity and so adjust to the carrying capacity of the environment. Equally, populations are capable of rapid increase when resources become abundant.		
	Extreme generalist	1

2. Ecological adaptability: To what extent Is the species adaptable (habitat, diet, environmental tolerance etc.)?	**Generalist**	**2**
	Specialist	3
	Extreme specialist	4
	Uncertain	5

Hippos are reliant on freshwater wetland features such as rivers, lakes, and springs. Typically, these animals spend most daylight hours in water, coming out at night to forage on short green grass consuming about 20-45 kg. of grass, daily (Lewison 2011). Although hippos are typically regarded as obligate herbivores and short-grass grazing specialists, the available data indicate that carnivory by hippos is an inherent dimension of their fundamental ecological niche (Dudley et al.2016). They are also known to consume farm crops leading to conflicts with humans. Hippos can be found resting on riverbanks when daytime temperatures are moderate.

3 Dispersal efficiency: How efficient is the species' dispersal mechanism at key life stages?	Very Good	1
	Good	**2**
	Medium	3
	Poor	4
	Uncertain	5

With sufficient grazing available, hippo tend to remain close to rivers. Grazing pressure tends to decrease with distance from water (Lock 1972). However, drought, arid conditions or competition with humans may cause hippo to seek resources some distance from their daily living space. In the Serengeti hippo tend to remain within 1.5km of the Mara River (Olivier & Laurie 1974); in Kruger National Park hippo are found up to about 5km from the Letaba River (Pienaar et al 1966) and up to 7km in the Queen Elizabeth National Park (Field 1970). Individuals of both sexes are prone to vagrant movements and may be found in water bodies far from their normal haunts (Skinner & Smithers, 1990). The wanderings of "Huberta" a hippo that moved from Natal to the Cape Province in South Africa over a period of three years and for a distance of about 1,800 km, is well documented (Chilvers, 1931 in Skinner & Smithers, 1990).

4. Interaction with humans: Is the species tolerant to human activity other than harvest?	No interaction	1
	Pest /Commensal	2
	Tolerant	**3**
	Sensitive	4
	Uncertain	5

The 2016 hippo survey report (BassAir 2017) discusses the correlation between hippo densities and human settlements. Hippo densities were not consistently lower nearer to human settlements, as it was expected. Some areas with higher densities of hippo indeed coincided with lower densities of permanent human settlements (e.g. in the Niassa NR, Maputo SR and along the shores of the Cahora Bassa dam, as well as along the Save, Limpopo and Maputo Rivers;). Similarly, some rivers with high human densities nearby indeed had no (or very few) hippo, e.g. the Lurio and Ligonha Rivers. However, there were also areas where the absence of hippo was not associated with high human densities, and others where hippo were widespread and/or abundant despite high levels of anthropogenic disturbance (e.g. along the Zambezi River). As discussed in point 9 below, the hippo is, after the Nile crocodile and the elephant, the species more often associated with human-wildlife conflicts.

National status

5. National distribution: How is the species distributed nationally?	Widespread, contiguous in country	1
	Widespread, fragmented in country	**2**
	Restricted and fragmented	3
	Localised	4
	Uncertain	5

The results of the 2016 partial aerial survey (BassAir 2017) show that hippo is a widespread species with a fragmented distribution in Mozambique.

Figure 2 shows the Hippo distribution and densities along the major rivers, lakes and dams of Mozambique during the 2016 survey in the late dry season while Figure 3 shows the geographic features of rivers and other waterbodies in the countries to make the reading of Figure 2 easier.

It has to be noted that the 2016 Hippo aerial survey was limited, for the sake of consistency, to the same waterbodies surveyed in 2010 (Mackie et al 2012). In any case Hippos are unquestionably distributed in areas not shown in Figure 2.

Figure 2: Hippo distribution and densities along the major rivers, lakes and dams of Mozambique during the late dry season of 2016 (survey areas in red, major rivers in blue, dispersion of hippo in brown circles). (Source: BassAir 2017.)

Figure 3: Map of Mozambique showing main rivers and waterbodies. Source: FAO, 2016. AQUASTAT website. Food and Agriculture Organization of the United Nations (FAO)

6. National abundance: What is the abundance nationally?	Very abundant	1
	Common	**2**
	Uncommon	3
	Rare	4
	Uncertain	5

The estimated abundance of hippo in Mozambique exceeds 8,000 individuals, more than twice the numbers estimated in 2010 (Mackie et al 2012). This estimate results from a targeted survey of hippo in 2016 (BassAir 2017) and from specific surveys in Gorongosa National Park-GNP (Stalmans M. & Peel M. 2016), Maputo Special Reserve-MSR (Hanekom, C.C. & Cumbane, R. 2016) and Sabie Game Park-SGP (de Villiers 2014,2015 and 2016). GNP and MSR were only partially surveyed and SGP was not surveyed at all during the specialized hippo aerial survey of 2016.

Moreover, as discussed in the 2016 hippo survey Report (BassAir 2017) the Marromeu complex (including the lower reaches of the Zambezi Delta), was purposefully omitted from the survey because the time required to cover their vast areas made this prohibitive during a country-wide count. The most recent data on the Marromeu-Zambezi Delta Complex includes two survey programs that were conducted in 2008 and 2009, the first one covering the late dry season of 2008 and the second one following in late wet season of 2009 of the Marromeu Complex, covering the Marromeu Special Reserve and adjacent parts of Coutadas 10, 11, 12, and 14. 115 hippos were estimated in 2008 and 252 in 2009 (Beilfuss et al 2010). In addition, a survey focused on elephants was conducted in November 2014 with the assistance of the Great Elephant Census project and WCS (Grossmann et al 2014a). This aerial survey estimated 142 (27-327 CL) hippos but only in the Marromeu Special Reserve as adjoining Coutadas and the Zambezi Delta itself were not covered. In 2016, a survey of the Marromeu Complex was carried out (CEAGRE 2017 in prep.). Although the results are still being analysed, 80 hippos were directly observed in the area; it has to be noted that the Marromeu Complex was extremely dry in 2016 and there were signs of hippos moving to the adjoining stretch of the Zambezi River that was not surveyed.

In addition, the Rovuma river in a stratum east and outside of the Niassa National Reserve, was surveyed in 2011 and estimated to contain 262 hippos (CL 27-564) (Craig 2012a). After 2011, this stratum (called WWF North) has never been surveyed again. (Craig 2013, Grossmann et al.2014b, BassAir 2017).

These were surveys of all large mammals and they are likely to be an underestimate for hippo given that they were not targeted at this species. It is a priority to carry out a survey focused on hippo in the Marromeu Complex in the near future, including also the upstream stretch of the Zambezi river where the 2016 hippo survey (BassAir 2017) stopped, in order to establish the abundance of hippo in this area.

Furthermore, ANAC has data on the regular surveys done in Sabie Game Park (355km2), a private Game Reserve on the border with South Africa's Kruger National Park. Between 2014 and 2016 these surveys have estimated 56-136 hippos in the portion of the Corumana Dam and other minor waterbodies pertaining to the Game Park (de Villiers 2014,2015 and 2016), the lowest count being 56 hippos in 2016, due probably to the persistent drought in the region.

To the estimates reported in the 2016 Hippo survey (BassAir 2017) and presented below in Table A, the results of surveys in note (1) substitute the estimate for Lake Urema and other waterbodies within the boundaries of the Gorongosa National Park, and in note (2) substitute the data for Maputo Special Reserve. It has to be noted, importantly, that these estimates represent minimum numbers of hippos present in Mozambique.

The apparent over count of hippo in 1986 (Tello in Lewison & Oliver,2008) followed by what the 2016 hippo survey (BassAir 2017) has confirmed as an undercount in 2010 (Mackie et al 2012), is likely to have led to an exaggeration of hippo decline in Mozambique. Furthermore, as recognized by Mackie et al 2012 their data set included several limitations such as the primary focus of the 2010 river counts was the crocodile (Fergusson, 2010), the estimate of hippo numbers along the south shoreline of Lake Cahora Bassa was from a survey designed to count the land-based wildlife and the estimate of hippo numbers in Maputo Special Reserve was from 5 years earlier.

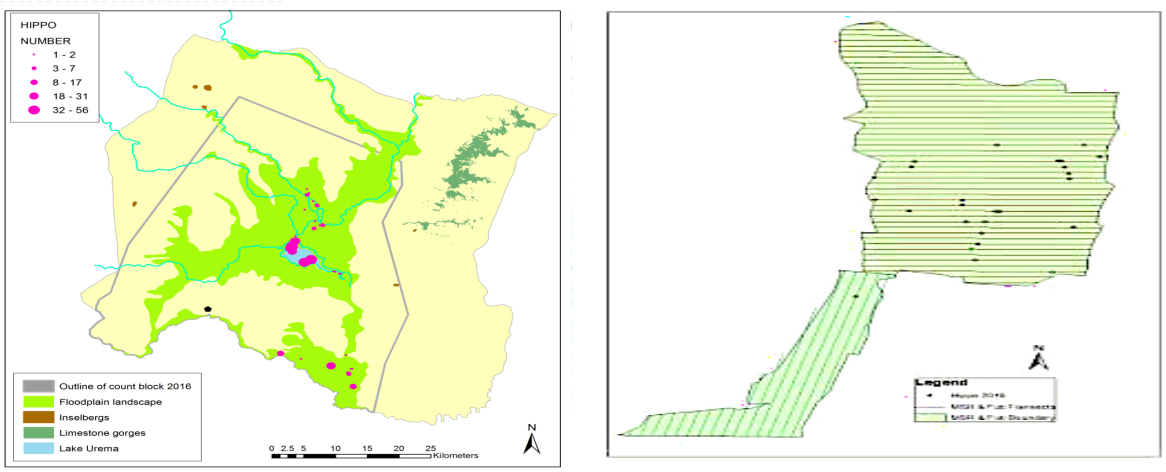
Table A: Summary of hippo population in each of the 2016 survey stretches. Availability biases calculated from counts on multiple photographs of the same hippo pod along waterbodies with different levels of visibility (see Mackie et al 2012). (Modified from BassAir 2017 see notes 1 & 2)

Waterbody	#Hippo observed	Correction factor for availability bias	#Hippo accounting for availability bias	#Hippo estimated for entire waterbody
Lake Malawi (Niassa)	0	1.03	0	0
Lucheringo River	13	1.03	13	20
Rovuma River	289	1.03	298	327
Lugenda River	771	1.04	802	802
Luatize River	0	1.04	0	0

Messalo River	0	1.04	0	0
Lurio River	0	1.04	0	0
Ligonha River	0	1.04	0	0
Zambezi River	1185	1.03	1221	1221
Cahora Bassa	3864	1.04	4019	4420
Pungwe River	4	1.05	4	6
Lake Urema (Note 1)	0	1.05	0	0
Save River	124	1.03	128	179
Limpopo River	15	1.03	15	23
Elefantes River	0	1.03	0	0
Massingir dam	92	1.04	96	96
Incomati River	36	1.04	37	41
Maputo River	22	1.05	23	23
Lebombo dam	0	1.05	0	0
Maputo SR lakes (Note 2)	82	1.05	86	129
TOTAL	**6497**		**6742**	**7288**

Note	Area	Source and comments	Hippo directly counted
(1)	Gorongosa National Park (including part of Pungwe River and Lake Urema). Total Count of 50% of the Park. See Figure 4 (left).	Stalmans M. & Peel M. **2016**. Previous reports (Stalmans 2012 and Stalmans et al 2014) provides figures on hippo recovery in Gorongosa NP, from 50 counted in the year 2000 to 227 counted in 2012, to >430 counted in 2014. Note that these are only the numbers of animals that were directly counted and no extrapolations were made.	**440**
(2)	Maputo Special Reserve (MSR). Total Count of 100% of the Reserve. See Figure 4 (right).	Hanekom, C.C. & Cumbane, R. **2016**. Total counts are done on a yearly basis since 2011 and the population has almost reached the pre-war (1972) estimates of 272 Hippo.	**219**

Figure 4: 2016 hippo distribution in Gorongosa National Park (left), and Maputo Special Reserve (right). (Source in Notes 1 and 2 above).



Priority areas for future, hippo-focused surveys include the above-mentioned Marromeu Complex, Lake Malawi (Niassa) only partially surveyed in 2016, the complete survey of the Rovuma River including the strata surveyed in 2011(Craig 2012a) and the un-surveyed Shire River from the confluence with the Zambezi up to the border with Malawi including adjacent lakes such as Calue and Damablangade and transboundary lakes such as Chilwa and Chiuta and lake Amaramba. Several other waterbodies could hold potential, although maybe minor, hippo populations in Mozambique.

7. National population trend: What is the recent national population trend?	Increasing	1
	Stable	**2**
	Reduced, but stable	3
	Reduced and still decreasing	4
	Uncertain	5

Although it is quite difficult to establish a baseline on which assessing trends in hippo populations in Mozambique and to compare data from the 2016 surveys with previous ones - as different methodologies were used and previous surveys were not devoted to hippos but to other species - it is clear that the hippo population in Mozambique is still large and most likely stable. The 2016 hippo survey is therefore considered the baseline on which to compare future hippo-focused surveys.

The hippo population in Mozambique appears to be large (8,000+) and stable. Note that caution should be exercised in relying upon old surveys or reports in evaluating the population trend, as some used different methodologies or surveyed hippo incidentally to other species.

In particular, the IUCN Red List Assessment for the Common Hippopotamus (Lewison, R. & Oliver, W. 2008) relied on an estimate from Tello (1986) that estimated the hippo population in Mozambique at about 18,000 individuals with most (10,000–12,000) reported to be in an area which includes the Marromeu National Reserve and four coutadas, known as the Marromeu Complex in the Zambezi river delta. However, this estimate is not considered accurate given the devastating impact of the 15-year civil war on Mozambique's biodiversity. Accordingly, this estimate has not been used as a baseline in more recent papers evaluating the hippo population post-war, including a paper on Biodiversity and War in Mozambique (Hatton et al 2001) which summarizes the effects of the 1977-1992 Civil War (the first post-war democratic elections were held in 1994) on the biodiversity in the country. It is also not reported in the survey report of Beilfuss and al 2010 which includes also the history of wildlife surveys in the area. The study from Mackie et al. 2012 also raised doubts on the reliability of the Tello (1986) estimates and their use in the IUCN assessment. As the civil war in Mozambique has had devastating effects on wildlife in many areas of the country, the present document discards completely the Tello 1986 estimate for the Marromeu Complex - as reported in the IUCN Red List Assessment for the Common Hippopotamus (Lewison, R. & Oliver, W. 2008) - which, furthermore was done in a period when it was almost impossible to travel safely within the country. In order to clarify the situation, it is worth noting that Eltringham (1999) reported some estimates from Mozambique as *in litt.* from Tello as follows: Gorongosa National Park (3483 in 1972 and 3597 in 1977) and the Zambezi Delta (2000–3000). Therefore, Eltringham (1999), based on Tello (*in litt.* to Eltringham 1999) has never reported 10,000-12000 hippos in the Marromeu Complex. These data, although no methods were specified and presumably were guess estimates, are in line with the most reliable data on hippo population during the pre-war period as reported for the Marromeu Complex (Zambezi Delta) in Hatton 2011 (250-2820 hippos) and Beilfuss et al 2010 and for Gorongosa National Park in Hatton 2011 and in Stalmans 2012 and Stalsman et al 2014. In particular, Stalsman (2012) provides figures on the wildlife recovery in the Gorongosa National Park since the pre-war estimates of 1972 (Tinley, 1977) and an important analysis of aerial survey methodologies. Therefore, we concur with Mackie et al. 2012 when they stated: "*The origin of the estimate of 10,000– 12,000 hippos [in the Marromeu Complex] is a mystery to us and maybe it was simply an error: perhaps the area of the Complex was mistaken for its hippo population? Whatever its origin, this error has been perpetuated for 25 years*."

In the majority of aerial surveys done in Africa in the last decades, systematic reconnaissance flight (SRFs) methodology has been the primary method used to assess large mammal populations. These surveys use fixed-wing aircraft to observe animals and can be effective for estimating population size and trend across large areas provided that they are methodologically consistent over the years (Craig 2012b), but heterogeneous observation conditions can lead to biases that may significantly underestimate the true population.

Aerial surveys carried out with the Systematic Reconnaissance Flight (SRF) methodology are not suitable for counting Hippos and crocodiles and other species associated with aquatic habitats such as the sitatunga (*Tragephalus spekei*) and they are likely to produce unreliable data due to the meandering nature of the rivers and lakes and the numerous turns and manoeuvres the pilot would be required to make and helicopter surveys with photographs and ground counts are the preferred methodologies for hippo counts (Jachmann 2001). Because population estimates from aerial surveys for large wildlife tends to underestimate the true numbers (Stalmans et. al 2014) and vary due to study-specific factors such as observers and habitat, caution should be taken when interpreting the results of surveys and analysing trends (Schlossberg et al. 2016).

In recent years (2000-to date) several aerial surveys have taken place in Mozambique, the great majority using SRF methodology and carried out to estimate trends in large mammals. This kind of survey is not really suitable for hippos. Even the study of Mackie et al 2012 included several limitations as reported in point 6 above and is considered an underestimate. The first countrywide wildlife survey in Mozambique was carried out in 2008 (AGRECO, 2008) and while it was undertaken at a very low sampling intensity (3%), it did not cover all areas and suffered from the above-described shortcomings of SRF methodology, it provided an important baseline for abundance and distribution of several species. This is the survey upon which the Mozambique Government has calculated hunting quotas since 2009 (see point 14). The 2008 countrywide wildlife survey estimated hippo population in the country at 8388 individuals (CL 3896 – 12879).

The 2016 Hippo survey (BassAir 2017) was preceded by an inception report on the planning and design of the survey (BassAir

2016) and took place between 20 November – 4 December 2016 during the late dry season, in order to maximize the visibility of hippo when the surface water levels were at their minimum. The survey used a Bell 206 Jet Ranger helicopter, which made it possible to: i) fly with the minimum requirement of four observers, enabling a more accurate count, as well as the inflight training of ANAC field staff in survey techniques; ii) fly slower, turn back, or even hover, enabling observers to recount animals that may have been hidden or submerged when the aircraft first passed, and iii) reduce availability bias, which is one of the largest sources of error in surveys. Availability bias was minimized by the two observers in the front of the aircraft scanning the survey rivers as far as possible ahead, and warning all other observers of any upcoming hippo. Since hippo frequently submerge as soon as the aircraft is overhead, the technical advisor took a series of photographs (as suggested also by Jachmann 2001) from as far away as possible, and counted the hippo pods from each photograph during the analysis component after the completion of the survey. Counting multiple photographs of the same hippo pod also provided a means of quantifying availability bias against the correction factors used by Mackie et al (2012), by calculating the proportion of hippo "available" in each photograph, out of the maximum number of hippo counted in all photographs of that group. In general, the maximum count was used as the final figure for the pod's size (Mackie et al 2012). Since crocodiles occupy the same aquatic habitat as hippo, a secondary count of crocodiles was undertaken simultaneously. Crocodiles encountered during the hippo survey were also counted. Wherever possible, the size of the observed crocodile was subjectively categorized as either small (<1.5m), medium (1.5 – 3m), large (3-4m) or extra-large (>4m). Since care was taken to retain the primary focus of the survey on hippo, the particular method and speed of flying was better suited to observing hippo than crocodiles. It should therefore be accepted that the crocodile count is likely to be an undercount, and as such should be seen as a Minimum Number Alive, rather than a representative population estimation.

In any case, it is certainly required that IUCN prioritize the revision of the Red List assessment (Lewison, R. & Oliver, W. 2008) for the Hippo population in Mozambique.

In conclusion, points 6 and 7 satisfy the CITES request to Mozambique to "*Provide information derived from the national survey undertaken in 2008 on the distribution, abundance and conservation status of H. amphibius in Mozambique, including details of methodologies employed*;" contained in point b) of the outstanding recommendation of the Standing Committee under the CITES Review of Significant Trade.

8. Quality of information: What type of information is available to describe abundance and trend in the national population?		
	Quantitative data, recent	**1**
	Good local knowledge	2
	Quantitative data, outdated	3
	Anecdotal information	4
	None	5

As the quality of information is now nearly optimal thanks to the 2016 specialized Hippo survey (Bass Air 2017), it is suggested that, in light of that survey report and of the information provided in this document, IUCN and UNEP-WCMC review their data for Mozambique, both in the IUCN Red List assessment (Lewison, R. & Oliver, W. 2008) and in the data that UNEP-WCMC provides to CITES and to other institutions such as the European Union.

To this end it is clear that the information provided by UNEP-WCMC to the CITES Standing Committee in document SC66 Doc. 31.2 Annex 2 were not clear and needs to be updated in many areas including alleged decline(see points 6 and 7), sustainable offtake levels (see point 14), main threats (see point 9) and legislation (see point 16 in the Conclusions page 4).

9 Major threats: What major threat is the species facing (underline following: overuse/ habitat loss and alteration/ invasive species/ other: and how severe is it?		
	None	1
	Limited/Reversible	**2**
	Substantial	3
	Severe/Irreversible	4
	Uncertain	5

The major threats to hippo in Mozambique have been categorized as follows:

a) Habitat Loss

It is widely acknowledged that the most important direct threat to biodiversity comes in the form of the conversion, loss, degradation, and fragmentation of natural ecosystems. (Heywood, (ed.) 1995). According to the 2015 Global Forest Assessment (FAO 2015) and based on a model developed during the National Forest Inventory (Marzoli 2007) it is assumed that the deforestation rate in Mozambique is 219.000 ha/year and has anthropogenic causes.

The study "Habitat Mapping in Mozambique" (CEAGRE 2015), illustrates that the country is mostly (586,009 km2, 74.2%) covered with natural habitats, while modified habitats cover 61,831 km2 (7.8%) and mixed habitat cover 141,918 km2 (18%). Modified areas are strictly associated with human population concentration, with the southern coastal zone, the Limpopo Corridor, the Beira Corridor, the provinces of Zambézia and Nampula in general, showing extensive modified areas and coincidentally, areas with greater population concentration.

b) Human-Wildlife Conflict

The Human population in Mozambique was, according to the last official census done in 2007, 20.632.434 people with a density of 26 people per km^2. It was projected at 27.128.530 for 2017 with a human density of about 33 people per km^2. The next national population census is scheduled to take place in the period 1-15 August 2017 (Instituto Nacional de Estatística- National Institute of Statistics).

Human population growth and demand for more land, water and other natural resources are intensifying conflicts between people and wildlife worldwide and Mozambique is no exception. Human-wildlife conflict (HWC) arise from direct and indirect negative interactions, leading to economic losses to agriculture through destruction of crops, human fatalities and injuries, depredation of livestock and retaliatory killings of wildlife. In southern Africa, intensification of land conversion to cultivation and/or human settlement is a key factor driving people into more direct contacts with wildlife (Lamarque et al.2009). HWC has a worldwide dimension but its effects are particularly severe in countries with rural communities living at or near the poverty level.

Without a way of benefiting from wildlife including hippo, wildlife is regarded as a liability and economic cost to rural communities, who suffer crop losses, other damages and lose human lives to wildlife. The most effective strategy to prevent this displacement is to integrate wildlife into rural economies as assets and to demonstrate that wildlife contributes to the welfare and development of people. The involvement and empowerment of rural people in natural resource management, in combination with economic and financial incentives through sustainable use, and linked with skills development and capacity building, should be the driver behind changes in attitudes towards wildlife of communities in Mozambique.

Several researches have been conducted on human wildlife conflict in Mozambique (among others Anderson & Pariela 2005, Lamarque et al. 2009, Dunham et al 2010, Bell et al. 2011).

In 2009, the Council of Ministers of the Government of Mozambique approved a five-years (2009-2014) National Human-Wildlife Conflict Mitigation Strategy (Estratégia de Gestão do Conflito Homem-Fauna Bravia) (Government of Mozambique, 2009). The main objective of the strategy was to ensure the permanent protection of people and goods, contributing to the conservation and sustainable use of wildlife to the economic and social benefit of the current and future generation of Mozambicans. The implementation of the HWC National Strategy involved several state services. The Ministry of Agriculture (MINAG) and the Ministry of Tourism (MITUR) were responsible for wildlife management respectively outside and inside conservation areas. In a supporting role, the Ministry of Public Works and Habitation (MOPH) was in charge of water supply in rural areas and the Ministry for the Coordination of Environmental Action (MICOA) was in charge of land use planning together with the Ministry of the State's Administration (MAE). A total of 32 districts out of 128 (25%), were identified as of critical HWC incidence.

Since 2015, the Ministry of Land, Environment and Rural Development (MITADER), though ANAC, is responsible of all wildlife management in the country implementing the new Conservation Law 16/2014 and the national HWC Strategy, which is now is in process of being revised and updated for the next 5 years, with the support of FAO. Drafts are in an advanced stage of preparation and the revised strategy (Government of Mozambique, in prep.) is expected to be approved by the end of 2017.

Among wildlife species, hippo appears to be, after the Nile crocodile and the elephant, the most involved in human conflicts in Mozambique (Government of Mozambique, in prep.). Human/hippo conflicts involve mainly the loss of human lives, human injuries, loss of crops and associated loss of incomes for local communities and is mainly due to an increase in settlements of people around or inside protected areas.

The following table B shows reported human-hippo conflicts entered in the HWC database maintained by ANAC.

Table B: Human-Hippo conflicts 2012 to 2016

Year	*People killed by hippo*	*People Injured by hippo*	*Crop damaged by hippo (ha)*	*Hippo killed in PAC*
2012	*12*	*3*	*65*	*17*
2013	*3*	*1*	*47*	*16*
2014	*0*	*3*	*52*	*22*
2015	*7*	*8*	*21*	*12*
2016	*10*	*3*	*68*	*42*
Total	***32***	***18***	***253***	***109***

Source: ANAC

In the period 2006- 2011, 27 people were killed by hippos and 85 Hippos were taken in Problem Animal Control (PAC) operations. From a preliminary analysis of these figures it seems that the increase in hippo killed in PAC operations is due to the fact that no hippos were given in quotas for sport-hunting due to the CITES trade suspension and this fact has in some cases exacerbated conflicts especially in areas with a high density of human population.

Harvest management:		
10. Illegal off-take or trade: How significant is the national problem of illegal or unmanaged off-take or trade?	None	1
	Small	**2**
	Medium	3
	Large	4
	Uncertain	5
From information gathered around the country, it appears that poaching is not an issue for hippo in Mozambique. It is believed to be very small but more information is needed.		
11. Management history: What is the history of harvest?	**Managed harvest: ongoing with adaptive framework**	**1**
	Managed harvest: ongoing but informal	2
	Managed harvest: new	3
	Unmanaged harvest: ongoing or new	4
	Uncertain	5

Trophy hunting is managed and regulated at the national level. Since the entry into force of the Forest Law 10/99 and its Regulation 12/2002, hunting has been managed through a quota system (see point 14). Hippo harvest is informed through specific studies and information gathered from authorities at the National, Provincial and district level and from concessionaires of the hunting areas. Management is adaptive with formal oversight and feedback through mandatory safari operator's Activity annual reports. Hunting areas are allocated trough a closed tender process. In Niassa National Reserve the tender process is established by the Reserve Management Authority on the basis of the leasing contract with ANAC.

In the Tchuma Tchato Community Programme hunting blocks are allocated through a direct negotiation between the Safari Operator and the Tchuma Tchato Programme Unit now in the Provincial Department of Land, Environment and Rural Development (MITADER- formerly Provincial Department of Tourism). It comprises 12 Blocks of which one was transformed in the Magoé National Park and three are not operational at the moment and in the process of being possibly transformed into National Reserves.

All hunting concessions are awarded to private safari operators subject to a binding contract. The obligations for the safari operator foreseen in the contract includes but are not limited to:

- Submit a management plan for approval by ANAC
- Submit for approval by ANAC by 30 March each year, the Annual Plan of Activities for the year in question and ensure its proper implementation. This plan is submitted together with the proposed quotas for the next season and the Annual Activity Report of the previous year. The first Annual Activity Plan must be submitted to ANAC within sixty (60) days from the date of the award of the contract. For the following years, the Annual Activity Plan shall be in accordance with the management plan in force;
- Send to ANAC by the 15th of December of each year, the Annual Activity Report prepared according to a format established by ANAC, which include, inter alia, personnel available, days of safaris made and quota utilization;
- Comply with and enforce the applicable laws and use and exploit the Hunting Area only under the terms and limits of this contract and ensure that the Professional hunter complies with applicable law and made the Concessionaire jointly liable for acts done by him;
- Require the approval of ANAC for activities related to hunting and ecotourism operations in the concession area in accordance with the rules established by law;
- Request ANAC, sufficiently in advance, hunting quotas and game hunting and PH licenses and pay their fees under the Act and under this contract;
- Ensure compliance with the hunting quotas approved for the respective hunting season, comply with and enforce hunting regulations and other legislation in force;
- Monitoring of poaching and other illegal activities by establishing and maintaining a supervisory body composed of sworn inspectors, guards and/or community workers which should focus on the recruitment of members of local communities;
- Collaborate with ANAC in the control and prevention of fires, indiscriminate use of natural resources, prospecting and illegal mining, soil erosion, contamination of water courses and the use of poisons and illegal fishing methods and movement of people once approved zoning plan;
- Carry out regular inventory of wildlife populations and their habitats, and simple systems of monitoring the trend of wildlife populations;

- Ensure that local communities currently residing in the Hunting Area be treated with courtesy, that their rights under the law in force are respected, to be established and develop with them, generating partnerships of mutual benefits that can be verifiable and quantifiable;
- Make all the agreements with the local communities in writing and within fifteen (15) days, deliver a copy to ANAC for approval and a copy to the government of the district area where the local community is established for knowledge and monitoring purposes;
- Give the local communities the benefits that have been agreed, as well as those resulting from the legislation that governs the matter, and support the development of income activities that benefit local communities;
- Distribute, whenever possible, part of game meat harvested by tourist hunters to local communities, health institutions, children, prison and school centers, or other places that take care of disadvantaged groups;

Concessions are awarded in general for a period of 5 years' renewable for 10 years if the obligations of the contract have been duly respected. In the Tchuma Tchato Community Programme some of the concessions have been granted for a renewable period of 20 years.

The Concessionaire is required by contractual obligations to purchase a number of licenses and permits, and pay various taxes to Government. Some of these fees are paid by the safari operators while others are paid by hunting clients.

The revenues obtained by the different fees from safari operators and sport hunters are re-invested in the operational costs of the Conservation Areas managed by ANAC including anti-poaching salaries and equipment.

12. Management plan or equivalent: Is there a management plan related to the harvest of the species?		
	Approved and co-ordinated local and national management plans	1
	Approved national /state/ provincial management plan(s)	2
	Approved local management plan	3
	No approved plan: informal unplanned management	**4**
	Uncertain	5

At present, there is no management plan for the species. ANAC, through funding from the MOZBIO project, is starting the necessary arrangements to develop a specific management plan, that, although not an international requirement, will provide a useful framework approach to the management of the species.

At national level ANAC/MITADER is the institution responsible for wildlife management and is also the CITES Management Authority. Other institutions collaborating in wildlife management are:
At National Level:
DNT – National Directorate of Land responsible for land use planning;
DNF – National Directorate of Forest, Ministry of Agriculture, responsible for Forest Management at national level;
Veterinary Services- Ministry of Agriculture;
Universities;
Environmental Police.
At Provincial Level
Provincial Directorate of Land, Environment and Rural Development (DPTADR), cooperates in: conflict resolution and local land use planning and initial advice on quotas allocation.
At District Level
District Services of Economic Activities (SDAE).

13. Aim of harvest regime in management planning: What is harvest aiming to achieve?		
	Generate conservation benefit	**1**
	Population management/control	2
	Maximise economic yield	3
	Opportunistic, unselective harvest, or none	4
	Uncertain	5

The harvest regime is aimed at achieving conservation benefits with the partial reinvestment of revenues in conservation activities with benefits for the local communities thereby increasing tolerance for hippos.

14 Quotas: Is the harvest based on a system of quotas?		
	Ongoing national quota: based on biologically derived local quotas	**1**
	Ongoing quotas: "cautious" national or local	2
	Untried quota: recent and based on biologically derived local quotas	3

	Market-driven quota(s), arbitrary quota(s), or no quotas	4
	Uncertain	5

Sport hunting is governed by the Forestry and Wildlife Law (Law10/99) and its regulations (Decree 12/2002) with a system of hunting quotas. Until the year 2014, the establishment of hunting quotas was made by two bodies (National Directorate of Conservation - DNAC / Ministry of Tourism MITUR and National Land Management and Forestry - DNTF / Ministry of Agriculture) responsible for the management of wildlife resources in the country. With the formation of the new government after the 2014 elections, the management of the natural resource sectors have been integrated into the Ministry of Land , Rural Development Environment (MITADER) and the National Administration of Protected Areas was created (ANAC), which implies the management of national network of conservation areas including the management of hunting in Mozambique and ANAC since 2014 is the sole authority responsible for the implementation of hunting legislations including the allocation of hunting quotas. The hunting regulations are in the process of being revised.

The size and composition of quotas depends on the estimated number of animals present in the hunting area, adjusted upwards and downwards for the various species on offer, depending on their population trends and impact of hunting on trophy quality. (Booth & Chardonnet, 2015)

Hunting quotas are given for areas open to foreign sport hunting such as Coutadas (Hunting Reserves), and Hunting Blocks around Niassa National Reserve, Community Programs hunting blocks (Tchuma Tchatu and Chipanje Chetu) and Game Farms, as well as areas for local national hunting (Multiple Use areas) and community quotas in selected areas.

Quotas are set in a participatory way between ANAC, Provincial Authorities and Safari Operators, whose Annual Activity Report is mandatory for quota setting, and are informed by surveys and local studies following the model described in the Quota setting Manual (WWF 1997 and edition in Portuguese,2004) which is widely used in Southern Africa. Until 2014 the quota was split between Ministry of Tourism and Ministry of Agriculture that was mainly in charge of Fazendas do Bravio (Game Farms).

Although hippos can withstand maximum sustainable offtakes at a level close to their population growth rate (Martin & Thomas, 1991), Mozambique's quotas for hippo for the period 2009-2012 were set, as shown in Table C, at a level between 1.27% and 2.07%, of the 2008 population estimate reported by the countrywide survey done in 2008 (AGRECO 2009) that, although it was carried out at a very low sampling intensity (3%), estimated the hippo population at 8388 (CL 3896–12879). This survey was the scientific basis on which hunting quotas were allocated.

Table C Hippo Hunting Quotas 2009-2012

YEAR	*QUOTA*	*Percentage of the population (estimate 8388 AGRECO 2009)*
2009	*161*	*1.92*
2010	*174*	*2.07*
2011	*123*	*1.47*
2012	*115*	*1.27*

Source: ANAC

Therefore, the assumption made in Mackie et al 2012, reported also by UNEP-WCMC in Standing Committee document SC66 Doc.31.2 Annex 2 , that the quotas were not sustainable as they were approaching the population growth rate, was unfounded as it was based on a wrong quota figure and their undercount of hippo in Mozambique.

The 2016 Hippo survey report (BassAir 2017) includes a series of recommendations on quota setting and in particular that the quotas shall not exceed 1% of the population and that they should be given only in the areas where a significant population of hippo was found.

While there is a wide agreement on the latter recommendation it is important to define the limits of the sport hunting quota. The quota recommended here is a two-tiered quota; the first tier is for sport hunting (restricted to adult males) and the second is for PAC (unselective) and communities. For sport hunting, in a model proposed by Martin (2005a and 2005b) it appears that the proportion of a hippo population which can be sustainably hunted to provide trophies is as low as that for elephant. For the hunting quota, restricted to adult males, the model implies an annual growth rate of about 7% and assumes that sport hunting will be restricted to hippos of 20 years and older (because of their large canines and body size). The model set the sustainable offtake of trophy hunting quotas at 0.5% of the total population, which is very similar to the proportion commonly used for elephant trophy hunting (0,3%-0,5%) around Southern Africa.

Furthermore, the sustainable offtake of trophy hunting quotas at 0.5% of the total population, is not affected by any other management interventions taking place at the same time (for example problem animal control) provided these other uses are unselective with regard to age and sex and fall within the overall sustainable limits (1%). Under adaptive management, the ages

of the animals killed should be monitored and, in succeeding years, the quotas should be adjusted upwards or downwards according to the criterion that a) there should be some animals amongst those killed which have reached an age of 30 years and b) the results of the monitoring in a given area are taken into account.

It is therefore recommended to set the quota for sport hunting in Mozambique, as illustrated in Table D below, at a percentage between 0,5% and 0,6% of the populations (limited to adult males) found in the hunting areas (blocks and coutadas) that are within the three major hotspots found in the 2016 specialized survey (BassAir 2017), integrated by other data as mentioned in point 6.

The quotas could be set at a higher percentage of 0,6% in the Cahora Bassa area and in the Lugenda-Rovuma basin and at 0,5% in the Zambezi River. The quota will include the Marromeu Complex at the condition that a proper monitoring programme, as discussed in the last paragraph of point 19, is started in the area leading to a proper scientifically-based assessment of the hippo population. In any case the sport hunting quota for the whole Zambezi River shall not exceed 6 hippos.

Table D: Recommended Sport Hunting Quota for Hippo in Mozambique

Area	*Quota*	*Comments*
Lugenda-Rovuma Complex *(Only in Niassa National Reserve Hunting Blocks bordering the rivers)*	*Set at 0,6%* *7*	*5 Lugenda River* *2 Rovuma River*
Cahora Bassa Dam *Only in Hunting Blocks in the Tchuma Tchato Community Program.*	*Set at 0,6%* *27*	*The majority of the quota should be given to hunting blocks in the southern shores of the Cahora Bassa Dam.*
Zambezi River	*Set at 0,5%* *6*	*3 hippos Coutada 7* *3 hippo in the Marromeu Complex coutadas.*
TOTAL	*40*	

The second quota tier, which includes PAC activities, shall carried out in accordance with the above-mentioned limits and shall be limited to serious cases. Caution should be taken in areas with low hippo densities, as removal of these animals is highly unlikely to be compensated for by natural dispersal from other source areas. This includes quotas in Multiple Utilization Areas (provincial hunting areas with no tourism hunting).

A small community quota can be maintained in hunting areas (besides coutadas and hunting blocks) with established community conservation activities.

It has to be understood that quotas are representing the maximum sustainable offtake in a given year. Real and actual offtakes are normally much lower thus enhancing sustainability. Furthermore the peculiar reproductive strategy of hippos (see point 1) as described by Smuts & Whyte (1981), has important implications for hippo management. It should be possible to maintain a hippo population in a highly productive state by harvesting: the corollary is that by not harvesting the population is unlikely to increase greatly – its own regulatory mechanisms will come into play to limit population growth.

In conclusion, the maximum sustainable offtake is of about 80 hippos (CL 70-90), representing about 1% of the estimated country population, with half of this number for sport hunting, spatially limited to the hotspots identified in the 2016 aerial survey (BassAir 2017) and to adult males, and the remaining part for PAC and community use.

Finally, the above satisfies the CITES request to Mozambique to "*Provide an explanation of the 'internal system of annual quotas' and other management measures in place*" contained in the first part of point a) of the outstanding recommendation of the Standing Committee under the CITES Review of Significant Trade as quotas for the period 2009-2012 were sustainable and they will be significantly reduced.

Control of harvest

15. Harvesting in Protected Areas: What percentage of the legal national harvest, occurs in State-controlled Protected Areas?	High	1
	Medium	**2**
	Low	3
	None	4
	Uncertain	5

The 32,5% (13 Hippos) of the proposed sport-hunting quota for hippo (see point 14) will be limited to State-controlled Protected Areas such as Coutadas, and some of the hunting blocks of the Niassa National Reserve.

Mozambique's system of Conservation Areas (CAs) has two purposes: to conserve ecosystems, wild habitats, biological diversity and natural resources for the benefit of present and future generations; and secondly, to contribute to the development and the social-economic well-being of Mozambicans, particularly the poor communities that live nearby.

The system is currently made up of seven National Parks, eight National Reserves, 17 Forest Reserves, 20 official hunting reserves (coutadas) and two Community Conservation Programs. Furthermore, Community Conservation Areas are now foreseen in the new Conservation Law and when established they will add to the system of CAs.

The currently legally established CAs cover about 219,231 km^2, which represent nearly the 28% of the country's land surface (799,380km^2). The approval of the Conservation Areas Law 16/2014 and its recent revision in 2016, the establishment of the Administração Nacional das Areas de Conservação (ANAC, National Administration of Conservation Areas) as an autonomous public agency tasked with the management of all Conservation Areas, the establishment of the Fundação para a Conservação da Biodiversidade (BIOFUND, Foundation for the Conservation of Biodiversity), mandated to raise funds to support the long-term management of Mozambique's Conservation Areas through innovative conservation financing tools, including the establishment of an endowment fund, the recent creation of new CAs (e.g. Ponta d'Ouro Marine Reserve, Lake Niassa Reserve, Magoe National Park and several new coutadas) and the improvement in the management effectiveness of CAs in the past 15 years, is a strong basis for ensuring the sustainable development of Mozambique's CAs and their contribution to poverty alleviation, biodiversity conservation and economic growth.

Hunting areas included in Conservation Areas (NNR Blocks, Coutadas, Community Programs and Game Farms) cover an extension of 131,425 km^2, equivalent to nearly the 17% of the country's land surface.

The extension of Conservation Areas is shown in Table E and they are mapped in Figure 5.

Table E: Extension of Conservation Areas in Mozambique (ANAC)

CONSERVATION AREAS FOR SUSTAINABLE USE (HUNTING AREAS)	Size in km^2	Percentage (%) of the country land area. (799,830 km^2)
Official Coutadas (20)	62,495	7,82
Niassa National Reserve Buffer Area Blocks (9)	27,977	3,50
Community Programs - Tchuma Tchato (12 blocks) + Chipanje Chetu	36,418	4,55
Game Farms (42)	4,535	0,57
TOTAL HUNTING AREAS	**131,425**	16,44
STRICTLY PROTECTED AREAS		
National Parks (7)	36,470	4,56
National Reserves (8)	49,096	6,14
Forest Reserves (17)	2,240	0,28
TOTAL STRICTLY PROTECTED AREAS	**87,806**	10,98
TOTAL CONSERVATION AREAS	**219,231**	**27,42**

Source: ANAC

Coutadas (Official Hunting Reserves) were created by colonial legislation in the 1930s. During the 1960's these were consolidated so that by the 1970's some 17 of these hunting areas had been gazetted as official reserves. Much of the hunting at that time focused on meat harvesting with limited sport hunting taking place.

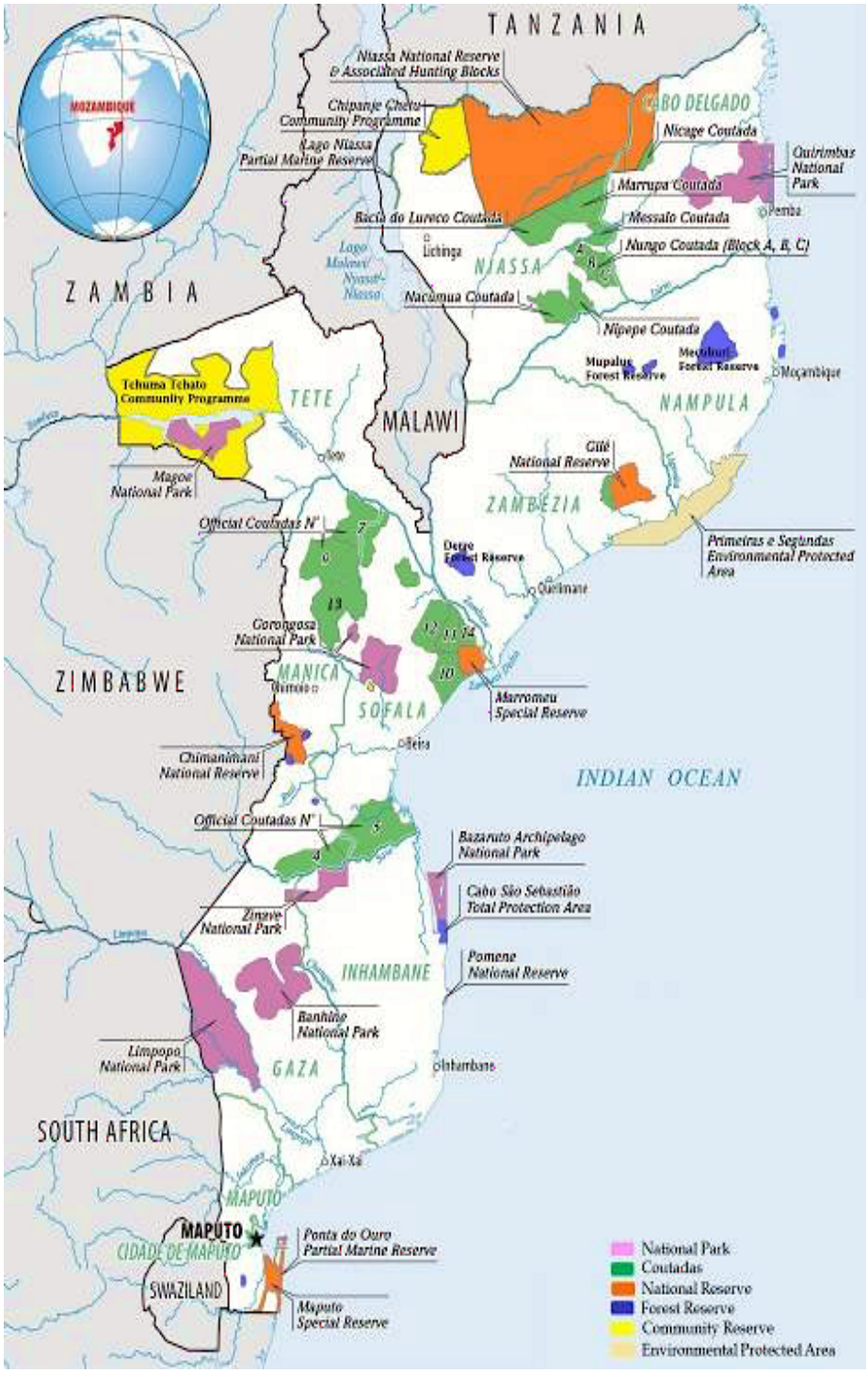
During the civil war period (1977-1992), organized sport hunting was effectively closed down and uncontrolled wildlife harvesting for meat was widespread across the country to feed the troops, leading to a decline in wildlife in many areas (Anstey, 2009, Hatton et al 2011).

As the hunting sector emerged from this period following the General Peace Agreement of 1992, so too were there changes in the number of hunting coutadas that were available. Some, such as Coutada 16, were incorporated into the Limpopo National Park while others were overrun by human settlements. Some coutadas were closed as the wildlife populations had been depleted and were not suitable to support a sustainable hunting industry. Those that remained open (Coutadas 4, 5, 7, 9, 10, 11, 12, 13,14 and 15) went through various periods of rehabilitation and only became active from 2002 onwards.

Following the creation of ANAC in 2014 several areas that were designated as Multiple Utilization Areas were transformed and gazetted as coutadas that according to the Conservation Law 16/2014 are designated as Conservation Areas for sustainable utilization and managed in accordance with a management plan duly approved by ANAC.

The right to hunt is only recognized by means of the concession contract between the State and the operator.

Figure 5 Conservation Areas of Mozambique (ANAC)



16. Harvesting in areas with strong resource tenure or ownership: What percentage of the legal national harvest occurs outside Protected Areas, in areas with strong local control over resource use?		
	High	**1**
	Medium	2
	Low	3
	None	4
	Uncertain	5

67,5% (27 Hippos) of the proposed sport-hunting quota for hippo (see point 14) will be allocated to the Hunting blocks in the southern shore of Lake Cahora Bassa where 50% of the Mozambique Hippo population is found, benefiting the rural communities in the area.

As an area with strong resource tenure, the Tchuma Tchato Community Programme in Tete Province originated in 1993 as an effort to start Community Based Natural Resource Management in the area around the Cahora Bassa Dam. The programme was initiated by the Direção Nacional de Florestas e Fauna Bravia (National Directorate for Forestry and Wildlife, DNFFB) and later

supported by IUCN, Ford Foundation and others (Filmao et al.1999) Local institutions were developed to manage the relationship with the operator, manage the local resources (including fisheries) and most importantly create a benefit sharing mechanism to re-distribute a portion of the state's royalties back to the local level from taxing of the hunting (Cunliffe, 2002). A specific Ministerial Decree of 2003 authorized a share of these taxes with 33% going to the local communities. The Tchuma Tchato Community area, including the Magoè National Park, hold the largest hippo population in Mozambique, the second largest elephant population in the country, shared with Zambia and Zimbabwe, and, among other species, important populations of lion, leopard and buffalo.

Other areas with strong local control over resource use are represented by Game Farms (Fazendas do bravio). Formerly established under the Ministry of Agriculture as areas designated to the breeding of wild species, Game Farms (Fazenda do bravio) are now considered Conservation Areas for sustainable use by the new Conservation Law 16/2014 and are fenced areas of private domain, designated for the conservation of fauna and flora where the right to hunt is limited to the holder of the land use rights (Land License or DUAT) or to those who have been authorized by that holder, provided that both acquire the respective license issued by the competent authority. There are 43 registered Game Farms in Mozambique covering an area of 4834km^2(483,414 hectares). The holder of the game farm may set up the balanced exploitation of certain species for meat production and utilization of by-products and other remains. The holder of the game farm who puts animals in captivity is responsible for their feeding, health and maintenance and he/she is the owner of the animals he introduces. If the holder of the game farm intends to claims ownership of the animals found in the area, he can buy them from the State. The repopulation of species is allowed on game farms, subject to the provisions in national legislation and in the management plan.

As of 2016 only 7 Game Farms are fully fenced. To obtain a license to operate a Game Farm. the applicant must meet the following criteria: Obtain land license (DUAT in accordance with Land Law); submit a Management Plan; introducing the wildlife in accordance with the law and carrying capacity. Since February 2016 the management and licensing of Game Farms is under ANAC. No Hippo Harvesting will take place in Game Farms except for potential PAC operations or community quotas.

17. Harvesting in areas with open access: What percentage of the legal national harvest occurs in areas where there is no strong local control, giving *de facto* or actual open access?	None	1
	Low	**2**
	Medium	3
	High	4
	Uncertain	5

A very limited number of hippos were allocated in quotas given to free areas designated a Multiple Use areas, managed at provincial level. This quota was given mainly for Problem Animal Control (PAC).

18. Confidence in harvest management: Do budgetary and other factors allow effective implementation of management plan(s) and harvest controls?	High confidence	1
	Medium confidence	2
	Low confidence	3
	No confidence	4
	Uncertain	5

The main constraints to effectively implement harvest controls are of financial nature. Now that since 2014-15 all hunting areas are under the control of ANAC and through the World Bank MOZBIO project, a better coordination of activities is underway. Training of provincial directorates on hunting issues is also important to improve the quality of the controls they are already performing.

Monitoring of harvest

19. Methods used to monitor the harvest: What is the principal method used to monitor the effects of the harvest?	**Direct population estimates**	**1**
	Quantitative indices	2
	Qualitative indices	3
	National monitoring of exports	4
	No monitoring or uncertain	5

Harvest Monitoring in Mozambique is based on a variety of systems:

a) Aerial surveys (see points 6 and 7);

b) An important monitoring tool is represented by the regular verification of the conditions included in the Management Plan of the hunting area, in the Annual Plan and in the Annual Activity Report that is done according to a specified format, valid for all hunting areas in the country (Hunting Blocks, Community Programs, Coutadas and Game Farms) Safari operators enter in a contractual agreement with ANAC in accordance with law 10/99 and law 16/2014 and among the various obligations for the safari operator prescribed in the contract, there is the Safari Operator's Annual Activity Report, where the operators are obliged to report all the activities related to the hunting season. These reports, developed by ANAC in a format to be compiled by the operators, contain an important amount of information such as quota and harvest monitoring, wildlife monitoring, law enforcement activities and communities and social aspects. These reports are analysed by ANAC also to verify any differences between the activities implemented and planned in the Annual Plan, which is another obligation of the safari operators;

c) The provincial offices of MITADER monitor the harvest of hippos through the trophy ownership certificates issued for every trophy harvested in Mozambique and through periodical visits to the hunting areas;

d) The Niassa National Reserve (NNR) developed internal hunting regulations since 2006 when it was managed by the Sociedade para a Gestão e Desenvolvimento da Reserva do Niassa Moçambique (SRN) in partnership with the then Ministry of Tourism. These hunting regulations were revised in 2013 since the Reserve is now co-managed by Wildlife Conservation Society and ANAC/MITADER since 2012. The Niassa Carnivore Project (NCP) is conducting regular monitoring of wildlife, in particular on large carnivores, in the NNR and some of the adjacent hunting blocks and other concessions since 2003. Regular counts of hippo in the Lugenda River between the Mbamba River confluences and the Msangezi River confluence (26 km) were done on foot and by canoe between 2004 and 2015. The hippo population in the monitored stretch of the Lugenda river has steadily increased from 76 hippos in 2004 to 183 hippos in 2015 (NCP 2015); and

e) CITES Annual Report data could play a very important role in monitoring, and better use of these data, along with better communication between CITES Authorities of different countries, would allow to build up increasingly accurate pictures of the effects of international trade on population trends. An analysis was done in accordance with the "Guide to using the CITES Trade Database", available at: http://trade.cites.org/cites_trade_guidelines/en-CITES_Trade_Database_Guide.pdf , with the following methodology: a search was done on the online CITES trade database (http://trade.cites.org/en/cites_trade/) using the trade terms, "trophies", "teeth", "tusks" and "skulls" and selecting the year range 2004-2013, Mozambique as the country of export, "All countries" for importing countries, "All sources", "All purposes", selecting "trophies", "teeth", "tusks" and "skulls" for trade terms, searching by taxon: *Hippopotamus amphibius*, selecting output type "csv", and selecting report type "Comparative Tabulations". The records where the origin was provided were deleted as these data represent re-exports. The following data were retrieved and are presented in table F.

Table F: Trade in Hippo hunting trophies from Mozambique 2004 – 2013 (source CITES Trade Database- MZ CITES Annual Reports)

Year	*Trophies*	*Teeth*	*Tusks*	*Skulls*
2004	*50*			
2005	*90*	*12*		
2006	*65*			
2007	*67*			
2008	*51*			
2009	*83*	*168*	*56*	*10*
2010	*68*	*36*	*402*	*6*
2011	***0 (95) see Note***	268	860	82
2012	***0 (99) see Note***	102	130	764
2013	*0*		*12*	

Note: 94 permits were issued for 95 hippos in 2011 and 98 permits were issued for 99 hippos in 2012 based on the analysis of the CITES annual reports of Mozambique.

In particular, an analysis of the 2012 Annual Report to CITES was carried out, to ascertain the origin of the abnormal number of skulls reported for that year that would have represented 764 hippos exported! It was discovered that erroneously 12 "skulls" instead of 12 "teeth" were reported and appeared in 66 out of 98 permits issued for 99 hippos exported in that year. A similar analysis was done for the year 2011 and there were 94 permits issued for 95 hippos.

12 teeth are normally exported as a trophy (Moore J. (AMOS Mozambican Association of Safari Operators) pers.comm.), the 4 canines and the 8 incisors. Therefore 12 teeth represent a hippo. The discrepancies in reporting suggested by the CITES recommendations are probably based on this mistake. The analysis is available on request. For the sake of clarity, sometimes a tooth is broken or missing and a tooth or a couple of teeth will not slide out of the jaw. If a client wants the skull, the tooth / tusk in the skull is left in the skull instead break open the skull / jaw in order to remove it. The taxidermist will take care of the removal before export. Adult hippos have thirty-six teeth including two incisors, one canine, three premolars and three molars on each half of the jaw on both sides. However, Adult hippos can retain some of their milk teeth for some years after developing their adult teeth meaning some hippos can have as many as forty teeth for a few years. (Laws 1968).

Moreover, it takes time to prepare a trophy for shipment and trophies that come from hunts conducted towards the end of the year are not likely to be exported in that year leading to a misjudgement of harvest levels.

Furthermore, as we cannot judge the annual reports of the importing countries we recommend a series of actions based on the following assumptions; a) trade analysis based on the CITES Trade Database is at least outdated by two years, and therefore it cannot detect with the necessary timing possible infractions and b) as mentioned above, it takes time to prepare a trophy for shipment and trophies that come from hunts conducted towards the end of the year are not likely to be exported in that year leading to a misjudgement of harvest levels.

Taking the above into account it is recommended that permits issued by the CITES Management Authority of Mozambique for

hippo or in general for hunting trophies of CITES-listed species be verified as follows:

a) Any Party that wishes to verify the authenticity of CITES permits and certificates issued by Mozambique should make a request for verification of CITES documentation to the CITES Management Authority of Mozambique;
b) On request, the CITES Management Authority of Mozambique will provide information to allow permit verification (e.g., provide a copy of the permit or certificate as issued, or verify a copy of the document provided by the importing country); and
c) The CITES Management Authority of Mozambique will provide information within 15 business days of the request for verification. If this is impossible, the Management Authority shall indicate a date by which they consider it will be possible to provide the information requested.

The procedure outlined above will avoid erroneous trade analysis and will also improve CITES enforcement as a whole, with the possible detection of fraudulent permits accepted by the countries of import.

In conclusion, the above satisfies the request to Mozambique to "clarify the perceived discrepancies between reported Customs data (imports) and CITES data (exports)" referred to in document AC25 Doc. 9.4" contained in the second part of point a) of the outstanding recommendation of the Standing Committee under the CITES Review of Significant Trade as levels of export of hippo trophies from Mozambique in the 2009-2012 period were not cause for concern.

Finally, although there is a monitoring system in place as discussed above, it is recommended to ANAC to adopt a specific monitoring system for hippo that all hunting concessions that have hippo in quota shall implement. The proposed monitoring system, using ground counts, has been provided to ANAC as a separate document. As population dynamics of hippo appears to be unusual (Smuts & Whyte 1981, Chomba et al. 2012), the population response to management interventions is difficult to predict. The proposed system includes several key parameters that needs to be monitored: population numbers, ages of all hippo killed, reproductive data, habitat use and human/hippo conflict because harvesting through sport hunting and problem animal control should be seen as an active adaptive management research opportunity. Under active adaptive management the effort is deliberately varied over a period of time so that the population characteristic (or response to the harvest) can be defined.

20. Confidence in harvest monitoring: Do budgetary and other factors allow effective harvest monitoring?	High confidence	1
	Medium confidence	2
	Low confidence	**3**
	No confidence	4
	Uncertain	5

There are budgetary, manpower and logistical constraints in Mozambique, but generally regular monitoring of hippo harvest takes place and will be optimal with the implementation of the specific monitoring system for hippo outlined in point 19.

Incentives and benefits from harvesting:

21. Utilisation compared to other threats: What is the effect of the harvest when taken together with the major threat that has been identified for this species?	**Beneficial**	**1**
	Neutral	2
	Harmful	3
	Highly negative	4
	Uncertain	5

When compared with the threats identified in point 9 above, legal, regulated harvest is beneficial for a variety of reasons.

Legal hunting is beneficial because it generates incentives for landowners (government, private individuals or communities) to conserve or restore wildlife on their land thereby conserving habitats, generate revenue for wildlife management and conservation, including anti-poaching activities and increase tolerance for living with wildlife, reducing the effects of human-wildlife conflicts and reducing illegal killing (IUCN 2016, Cooney et al.2017).

Concessions holders secure the areas with antipoaching teams, provide permanent and seasonal jobs to local people, provide benefits to the local communities in kind and cash, and improve habitat and wildlife conditions.

As also recognized by the authors of recent reports on the aerial survey of elephants carried out in 2014" Current protection status seems to be dependent on the management holders of hunting concessions in the area" (Grossmann et al 2014c). This report is from the area that holds the most important hippo population in Mozambique, the second largest elephant population and an important lion population. The same applies to the majority of the areas where hunting occurs in Mozambique. The recent decrease of hunting clients due to the world economic crisis, but also to restrictions on import of some species, could have disastrous consequences on the wildlife in Mozambique. The hunting operators are the first line of defence in the fight against illegal activities and their devotion to conservation is limited if financial resource is taken away by blanket import suspensions.

The analysis of the Safari Operator's s Annual Activities Reports shows a high degree of commitment and actions of the hunting operators toward wildlife conservation but also toward improving the livelihoods of some of the poorest rural communities in Africa.

22. Incentives for species conservation: At the national level, how much conservation benefit to this species accrues from harvesting?	High	1
	Medium	**2**
	Low	3
	None	4
	Uncertain	5

An analysis of the Safari Operator's s Annual Activities Reports shows the following benefits that sport-hunting provides to wildlife and their habitat:

1) direct revenues e.g., jobs for local people. Safari Hunting Companies employed more than 800 people in 2015 of which about 40% were seasonal workers. Among these people there were also the anti-poaching teams.
2) Meat is provided to the local communities. Although is difficult to assess the quantity, it is an important source of protein and increase the tolerance of communities toward wildlife and their understanding of legal regulated harvesting.
3) assignment of monetary value to large dangerous animals and thus, increased incentive for rural people to tolerate hippos outside of National Parks,
4) increased financial and logistical support for anti-poaching,
5) protection of native species through decreased bush-meat poaching, Thousands of snares are removed annually by the anti-poaching teams of the hunting operators.
6) protection of habitat against land conversion and unsustainable resource extraction e.g., logging and mining
7) decreased livestock presence, overgrazing and associated desertification

Each point serves to reduce existing threats as well as tolerance of rural communities toward wildlife, all of which serve to reduce poaching.

In financial terms anti-poaching, area management and community development voluntary expenditures were analysed for 13 Hunting Operators and data are presented in Table G below.

Table G: Voluntary Contributions of 13 Hunting Operators for Anti-poaching, Block development and community development 2013-2015 (in USD).

Anti-poaching (USD)	*Block Development (USD)*	*Community Development (USD)*	*TOTAL*
1.222.500,00	*955.150,00*	*830.300,00*	*3.007.950,00*

Source: ANAC

23. Incentives for habitat conservation: At the national level, how much habitat conservation benefit is derived from harvesting?	High	1
	Medium	**2**
	Low	3
	None	4
	Uncertain	5

Legal harvesting of hippo contributes to habitat conservation because the hunting operators through their anti-poaching teams and through their contractual and legal obligations, provide important actions for this purpose. Habitat conservation is a priority in hunting concessions.

Throughout current hippo range, the best quality and largest tracts of intact habitat are located in Conservation Areas(CAs) which includes Hunting Areas such as Coutadas, Hunting Blocks of NNR, Community Programs and game farms (CEAGRE 2015), that together comprise nearly contiguous ecosystems. In Mozambique, hunting areas declared as CAs that support hippo is approximately twice the size to its National Parks and National reserves where hunting is prohibited. Sport-hunting serves to keep lands wild thereby protecting vast tracts of habitat. Therefore, where hunting operations are in place, the threat of habitat modification and loss are significantly reduced.

In many of Mozambique's Hunting areas, safari hunting operations represent an important form of protection for wildlife and other natural resources. In the absence of safari operations and where there are no other sources of income and meat for rural people, encroachment and habitat degradation via deforestation (e.g. charcoal production) occurs very quickly i.e., often within a matter of weeks to months. Initial encroachment for resource extraction (charcoal, poaching) is typically followed by establishment of villages, conversion to agriculture, and introduction of domestic livestock.

With the establishment of hunting and the protection that it provides for the habitat and animals, many short-term effects of habitat modification can be reversed in a short time (relocation of settlements, secondary regeneration of bush). Likewise, although the recovery period could be longer, habitats that have suffered longer-term negative impacts to the environment (severe habitat degradation by overgrazing of livestock) can, under proper management, be restored to support wildlife. Examples in Mozambique of the above are some of the Coutadas, or, in the SADC region, the Conservancies in Namibia, in conservancies in Zimbabwe's South Lowveld and Zambia's Open Game Ranches.

Thus, sport-hunting serves to significantly reduce the rate of habitat degradation and loss, and, when established and promoted in already degraded areas can serve to restore habitat for hippo and wildlife.

Protection from harvest:

24. Proportion strictly protected: What percentage of the species' natural range or population is legally excluded from harvest?	**>15%**	**1**
	5-15%	2
	<5%	3
	None	4
	Uncertain	5

Harvest is prohibited in the recently established (2013) Magoè National Park that covers nearly 45% of the southern shore of Cahora Bassa Dam that accounts for 50% of the hippo populations in Mozambique. Other important hippo populations excluded from harvest are found in Gorongosa National Park, and in protected areas along the Save River (Zinave National Park and Coutadas 4 and 5 that will not receive a quota for the time being). Therefore, a substantial part of the population is excluded from harvest. Moreover, according to the Mozambique legislation, it is a crime, punishable with imprisonment up to sixteen years, to harvest without a license, any protected or prohibited species of wildlife, including the species listed in Appendices I and II of CITES.

25. Effectiveness of strict protection measures: Do budgetary and other factors give confidence in the effectiveness of measures taken to afford strict protection?	High confidence	1
	Medium confidence	**2**
	Low confidence	3
	No confidence	4
	Uncertain	5

As one of the poorest countries in the world Mozambique faces important environmental challenges. In particular, budgetary constraints have been and, in some cases, continue to be an impediment to achieve proper effectiveness of natural resources' protection. In the last years thanks to the successful partnership between the government and many key national and international players over the past 15 years, including among others, the World Bank, IFC, GEF, AfD, KfW, PPF and USAID, several progresses have been achieved including the approval of a new Conservation Policy and Conservation Areas Law (16/2014); and the establishment of the Administração Nacional das Áreas de Conservação (ANAC) as an autonomous public agency tasked with the management of all Conservation Areas. Recently (2016), the 2014 Conservation Law has been strengthened with stronger penalties to punish illegal activities especially on wildlife related crimes.

Moreover, the Government of Mozambique, with the assistance of the World Bank, is implementing the MOZBIO project, an ambitious long-term program that brings biodiversity conservation, tourism development and poverty reduction together. A sub-component of this project is dealing with the improvement of sustainable wildlife utilisation and will support the provision of training and technical assistance, including advisory services for the establishment of a management system for revenues collected from sport hunting, to improve the statistics and collection of sport hunting activities, and development of sport hunting and species plans and studies and land availability studies.

Trophy hunting in Mozambique has developed over the last 15 years to the point where it is now recognized as a sustainable and economically viable form of land use that is consistent with the national policy of promoting wise-use of wildlife. It is also recognized that the industry can directly benefit rural communities living within, or bordering onto Reserves and hunting areas, and can contribute significantly to the protection of CAs in general. Such benefits can be in the form of employment, social amenities (schools, clinics etc.) and from skills transfer across a broad range of opportunities (camp managers, mechanics, administration, professional guiding, hospitality etc.) (World Bank 2014).

26. Regulation of harvest effort: How effective are any restrictions on harvesting (such as age or size, season or equipment) for preventing overuse)?	Very effective	1
	Effective	**2**
	Ineffective	3
	None	4
	Uncertain	5

The quota system together with the restricted hunting season (April-November) are the main mechanisms for restricting harvest. Management of damage causing animals outside of protected areas is based on a National Strategy with clear interventions options.

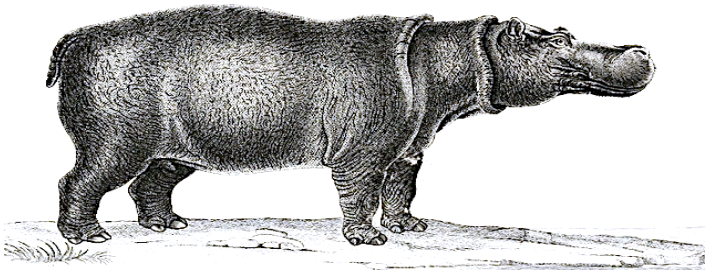


Illustration from: Frédéric Cuvier - Histoire naturelle des mammifères (1819–1842)

REFERENCES

Anderson J. and Pariela F. (2005). Strategies to mitigate human-wildlife conflict in Mozambique. Mozambique National Directorate of Forests and Wildlife.

Anstey, S. (2009). Institutional Change and Community Based Natural Resource Management in Northern Mozambique. A thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy (Applied Social Sciences), Centre for Applied Social Sciences, University of Zimbabwe, May 2009

AGRECO (2008) National Census of Wildlife in Mozambique. Final Report. Ministry of Agriculture, Maputo, Mozambique. Available online at:
http://www.elephantdatabase.org/system/population_submission_attachments/files/000/000/395/original/svyFSMZNAT2008AS.pdf
http://www.rhinoresourcecenter.com/index.php?s=1&act=pdfviewer&id=1290817769&folder=129

BassAir (2017) Study on distribution, abundance and conservation status of common hippopotamus (Hippopotamus amphibius) in Mozambique. Unpublished report to ANAC. February 2017.

Beilfuss, R.D., Bento, C.M., Haldane, M. & Ribaue, M. (2010) Status and Distribution of Large Herbivores in the Marromeu Complex of the Zambezi Delta, Mozambique. Unpublished report. WWF, Maputo, Mozambique. Available online at: http://www.biofund.org.mz/wp-content/uploads/2015/03/Aerial-Survey-Report-Marromeu-2010-Beilfuss-et-al-2.pdf

Booth, V.R. & Chardonnet, P., eds. (2015). Guidelines for improving the administration of sustainable hunting in sub-Saharan Africa. Harare, FAO Sub-regional Office for Southern Africa. Available online at: http://www.fao.org/3/a-bo583e.pdf

CEAGRE (2015). "Habitat Mapping in Mozambique", Universidade Eduardo Mondlane. Faculdade de Agronomia e Engenharia Florestal. Centro de Estudos de Agricultura e Gestão de Recursos Naturais (CEAGRE), BIOFUND and WWF. Maputo, Mozambique 2015. Available online at: http://www.biofund.org.mz/wp-content/uploads/2015/04/Mapeamento-de-habitats-Mo--ambique-BIOFUND-200415.pdf

CEAGRE (2017 in preparation) Relatório da Contagem Aérea de Fauna Bravia no Complexo de Marromeu (Report on the wildlife aerial survey in the Marromeu Complex). Universidade Eduardo Mondlane. Faculdade de Agronomia e Engenharia Florestal. Centro de Estudos de Agricultura e Gestão de Recursos Naturais (CEAGRE). Unpublished report to ANAC. MOZBIO project. Maputo.

Chilvers, H. E. (1931). Huberta goes south: a record of the lone trek of the celebrated Zululand hippopotamus, 1928–1931. Gordon and Gotch, London, cited in: Skinner J.D., & Smithers R.H.N. 1990. Family Hippopotamidae - Hippopotamus. In: The mammals of the Southern African Subregion. 2 ed. University of Pretoria; p 599-604.

Chansa W, Senzota RB, Chabwela H, Nyirenda V (2011). The influence of grass biomass production on hippopotamus population density distribution along the Luangwa River in Zambia. J. Ecol. Nat. Environ., 3: 186-194.

Chomba C, Senzota R., Chabwela H. and Nyirenda V. (2012). Population status of the common hippopotamus (Hippopotamus amphibius) in Luangwa River, Zambia. Journal of Ecology and the Natural Environment Vol. 4(9), pp. 247-257, June 2012 Available online at http://www.academicjournals.org/JENE DOI: 10.5897/JENE11.141

Chomba, C., Simpamba, T., Kampamba, G. and Nyirenda, V. (2014) Does the Luangwa Hippo Population Size and Density Distribution vary between Upper and Lower Study Blocks? What Are the Management Implications of Such Distribution Pattern? Open Journal of Ecology, 4, 262-280. http://dx.doi.org/10.4236/oje.2014.45025

CITES (1994). Convention on International Trade in Endangered Species of Wild Fauna and Flora. Consideration of proposals for amendment of Appendices I and II, Proposal 18. Ninth meeting of the Conference of the Parties (Fort Lauderdale (USA), November 1994). Available online at: https://www.cites.org/sites/default/files/eng/cop/09/prop/E09-Prop-18_Hippopotamus.PDF

Cooney R., Freese C., Dublin H., Roe D., Mallon D., Knight M., Emslie R., Pani M., Booth V., Mahoney S. and Buyanaa C. (2017). The baby and the bathwater: trophy hunting, conservation and rural livelihoods. FAO Unasylva 249, Vol. 68, 2017/1. Available online at: http://www.fao.org/publications/card/en/c/b9ab7023-3045-4d6b-b782-87907ef6b7c7/

Craig, G.C. (2012a) Aerial Survey of Quirimbas National Park and Adjacent Areas, October 2011. WWF. Annex I of Aerial Survey of Wildlife in the Niassa Reserve, October 2011, Sociedade para a Gestão e Desenvolvimento da Reserva do Niassa, Maputo.

Craig, G.C. (2012b) Monitoring the Illegal Killing of Elephants: Aerial Survey Standards for the MIKE Programme. Version 2.0. CITES MIKE programme, Nairobi

Craig, G.C. (2013). Aerial Survey of Quirimbas National Park and Adjoining Areas, WWF Mozambique.

Cunliffe, R. (2002) Biodiversity and Wilderness Evaluation of the Tchuma Tchato Project Area surrounding Lake Cahora Bassa, Tete Province, Mozambique (2 vols.). Biodiversity Foundation for Africa

De Villiers, P.A. (2014,2015 and 2016). Management Reports of the Sabie Game Park. ECOKNOW. Unpublished reports.

Dudley, J. P., Hang'Ombe, B. M., Leendertz, F. H., Dorward, L. J., de Castro, J., Subalusky, A. L. and Clauss, M. (2016), Carnivory in the common hippopotamus (Hippopotamus amphibius): implications for the ecology and epidemiology of anthrax in African landscapes. Mammal Review, 46: 191–203. doi:10.1111/mam.12056

Dunham, K.M., Ghiurghi A., Cumbi R. and Urbano F. (2010). Human–wildlife conflict in Mozambique: a national perspective, with emphasis on wildlife attacks on humans. Fauna & Flora International, Oryx, 44(2), 185–193 doi:10.1017/S003060530999086X

Eltringham, S.K. (1999). The Hippos: Natural History and Conservation. T & AD Poyser Ltd. UK.

FAO Global Forest Assessment (2015). Country Report Mozambique. Food and Agriculture Organization of the United Nations (FAO) Rome 2014

Fergusson, R.A. (2010) Survey of Crocodile Populations in Mozambique—2010. Ministry of Agriculture, Maputo, Mozambique & AGRECO G.E.I.E., Brussels, Belgium.

Field C.R. (1970). A study of the feeding habits of the hippopotamus in the Queen Elizabeth National Park, Uganda, with some management implications. Zool. Afr. 5:71-86.

Filmao E., Mansur E. and Namanha L. (1999). Tchuma Tchato: an evolving experience of community- based natural resource management in Mozambique. Proceedings of the International Workshop on Community Forestry in Africa; Participatory forest management: a strategy for sustainable forest management in Africa. Banjul, the Gambia.

Government of Mozambique. (2009). National Human-Wildlife Conflict Mitigation Strategy 2009-2014 (Estratégia de Gestão do Conflito Homem-Fauna Bravia)

Government of Mozambique. In prep. Revision of the National Human-Wildlife Conflict Mitigation Strategy (Revisão da Estratégia de Gestão do Conflito Homem-Fauna Bravia)

Grossmann, F., Lopes Pereira, C., Chambal, D., Bay, C., Mudluli, A., Peltier, A. Foloma, M., Ntumi, C., Polana E., Nelson, A., (2014a) Aerial Survey of Wildlife and Human Activity in the Marromeu Buffalo Reserve (Reserva Especial de Marromeu). Wildlife Conservation Society, New York.

Grossmann, F., Lopes Pereira, C., Chambal, D., Guilherme dos Santos, M., Bendzane, E., McLellan P., Foloma, M., Ntumi, C., Polana E., Nelson, A. (2014b). Aerial Survey Report of Elephant, Other Wildlife and Human Activity in Quirimbas National Park and the Western Corridor. Wildlife Conservation Society, New York.

Grossmann, F., Lopes Pereira, C., Foloma, M., Ntumi, C., Chambal, D., Bay, C., Mudluli, A., Peltier, A., Maluleque, G., Bendzane, E., McLellan P., (2014c). Aerial Survey of Wildlife and Human Activity in the Tete Province: Lake Cahora Bassa and Magoe National Park. Wildlife Conservation Society, New York.

Hanekom, C.C. & Cumbane, R. (2016) Aerial Census Report for Maputo Special Reserve, Futi Corridor & the Sanctuary Area. September 2016. Ezemvelo KZN Wildlife unpublished report.

Hatton, J., Couto, M. & Oglethorpe, J. (2001) Biodiversity and War: A Case Study of Mozambique. WWF Biodiversity Support Program, Washington, DC, USA.

HEYWOOD, V.H. (ed.) (1995). The Global Biodiversity Assessment. United Nations Environment Programme. Cambridge University Press, Cambridge. pp xi+1140.

IUCN (2016). Informing decisions on trophy hunting - A Briefing Paper for European Union Decision-makers regarding potential plans for restriction of imports of hunting trophies. IUCN, Gland. April 2016. Available online at: http://cmsdata.iucn.org/downloads/iucn_informingdecisionsontrophyhuntingv1.pdf

Instituto Nacional de Estatística- National Institute of Statistics. Accessed online at: http://www.ine.gov.mz/

Jachmann H. (2001). Estimating abundance of African Wildlife: an aid to adaptive management. Kluwer Academic Publishers 285 pp.

Le Bel S., Murwira A., Mukamur B., Czudek R., Taylor R. and La Grange M. (2011). Human Wildlife Conflicts in Southern Africa: Riding the Whirl Wind in Mozambique and in Zimbabwe, in The Importance of Biological Interactions in the Study of Biodiversity. Edited by Jordi Lopez Pujol, ISBN 978-953-307-751-2, 402 pages, Publisher: InTech, Chapters published September 22, 2011 under CC BY-NC-SA 3.0 license DOI: 10.5772/1831 http://www.intechopen.com/books/the-importance-of-biological-interactions-in-the-study-of-biodiversity/human-wildlife-conflicts-in-southern-africa-riding-the-whirl-wind-in-mozambique-and-in-zimbabwe

Lewison, R. (2007) Population responses to natural and human-mediated disturbances: Assessing the vulnerability of the common hippopotamus (Hippopotamus amphibius). African Journal of Ecology, 45, 407-415. http://dx.doi.org/10.1111/j.1365 2028.2006.00747.x

Lewison, R. & Oliver, W. (IUCN SSC Hippo Specialist Subgroup). (2008). Hippopotamus amphibius. The IUCN Red List of Threatened Species 2008: e.T10103A3163790.
Available online at: http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T10103A3163790.en. Downloaded on 20 March 2017.

Lewison, R. (2011) Family Hippopotamidae (Hippopotamuses) Pp. 308-319 in: Wilson, D.E. & Mittermeier, R.A. eds. (2011) Handbook of the Mammals of the World. Vol.2 Hoofed Mammals. Lynx Edicions, Barcelona.

Lock J.M. (1972). The effects of hippopotamus grazing on grasslands. J. Ecol. 60: 445-467

Mackie, C.S., Dunham, K.M. and Ghiurghi, A. (2012). Current status and distribution of the Vulnerable common hippopotamus (Hippopotamus amphibius) in Mozambique. Oryx, 47(1), 70–76 doi:10.1017/S0030605311001554

Marshall, P.J. & Sayer, J.A. (1976) Population ecology and response to cropping of a hippo population in Eastern Zambia. J. Appl. Ecol. 13, 391–403.

Martin, R.B. (2005a). Transboundary Species Project Background Study: Hippopotamus. The Transboundary Mammal Project of the Ministry of Environment and Tourism, Namibia facilitated by The Namibia Nature Foundation. Windhoek

Martin, R.B. (2005b). Ministry of Environment and Tourism (MET) Republic of Namibia. Species Management Plan; Hippopotamus (Hippopotamus amphibius), September 2005. Windhoek.

Martin, R. & Thomas, S. (1991) Quotas for Sustainable Utilization in Communal Lands. Manual for District Councils with Appropriate Authority. Zimbabwe Trust & Department of National Parks & Wild Life Management, Harare, Zimbabwe.

Marzoli, A. (2007): "National forest inventory." Integrated Forest Assessment of Mozambique (AIFM), Ministry of Agriculture Maputo.

NCP. Niassa Carnivore Project (2015). 2015 Niassa Carnivore Project Annual Report.

Ntumi, C.P. (2012). A landscape approach to elephant conservation in Mozambique (Doctoral dissertation, University of Pretoria).

Olivier R.C.D. & W.A. Laurie (1974). Habitat utilisation by hippopotamus in the Mara River. E.Afr.Wildl.J. 12: 249-271

Pienaar U.de V, P. Van Wyk and N. Fairall (1966). An experimental cropping scheme of hippopotami in the Letaba River of the Kruger National Park. Koedoe 9: 1-33

Schlossberg S, Chase MJ, Griffin CR (2016) Testing the Accuracy of Aerial Surveys for Large Mammals: An Experiment with African Savanna Elephants (Loxodonta africana). PLoS ONE 11(10): e0164904. doi:10.1371/journal.pone.0164904

Skinner J.D., & Smithers R.H.N. (1990). Family Hippopotamidae - Hippopotamus. In: The mammals of the Southern African

Subregion. 2 ed. University of Pretoria; p 599-604.

Smuts, G.L. and Whyte, I.J. (1981). Relationships between reproduction and environment in the hippopotamus Hippopotamus amphibius in the Kruger National Park. Koedoe, 24(1): 169–185.

Stalmans, M. (2012). Monitoring the recovery of wildlife in the Parque Nacional da Gorongosa through aerial surveys 2000-2012. Available online at: http://www.gorongosa.org/sites/default/files/research/053-wildlife_count_report_2000_2012_july2012.pdf. Accessed 23 March 2017.

Stalmans, M., Peel, M., Massad, T. (2014). Aerial wildlife count of the Parque Nacional da Gorongosa, Mozambique, Parque Nacional da Gorongosa. Unpublished report. Available online at: http://www.biofund.org.mz/wp-content/uploads/2015/03/GorongosaAerialWildlifeCount2014-GeneralReport-December2014-compress.pdf

Stalmans, M. & Peel, M., T. (2016). Aerial wildlife count of the Parque Nacional da Gorongosa, Mozambique, Parque Nacional da Gorongosa. 2016. Unpublished report.

Tinley, K.L. (1977). Framework of the Gorongosa Ecosystem. Ph.D. thesis. University of Pretoria.

World Bank. (2014). Mozambique - Conservation Areas for Biodiversity and Development Project (MOZBIO 1). Washington, DC: World Bank Group.

WWF. (1997). Quota setting manual. Wildlife management series. WWF Zimbabwe, Zimbabwe Trust and Safari Club International. Portuguese edition 2004.

WWF. (2000). District quota setting toolbox. Wildlife management series. WWF SARPO, Zimbabwe Trust and Safari Club International.

INFORMATION ON PENINSULAR MALAYSIA'S NON-DETRIMENT FINDINGS APPROACH FOR TRADE IN RETICULATED PYTHON (*Python reticulatus*) SKINS

This report has been prepared for the CITES Secretariat by the CITES Management and Scientific Authorities of Malaysia.

Biodiversity and Forest Management Department,
Ministry of Natural Resources and Environment (NRE)
Level 12, Tower Block, Lot 4G3, Precint 4
Federal Government Administrative Centre
62574 PUTRAJAYA
Email: citesmalaysia@nre.gov.my

Department of Wildlife and National Parks Peninsular Malaysia (PERHILITAN)
Km. 10, Jalan Cheras
56100 Cheras
KUALA LUMPUR
Email: khadiejah@wildlife.gov.my

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INTRODUCTION

The harvest and trade of reticulated pythons (*Python reticulatus*) for their skins has been ongoing in Malaysia since the 1950's (Groombridge and Luxmoore, 1991; Jenkins and Broad, 1994). Today, a harvest quota restricts the number of specimens harvested each year to 162,000, making Malaysia the largest exporter of reticulated pythons after Indonesia (Ashley, 2013). In 2002, the European Union banned imports of reticulated python skins from Peninsular Malaysia because of high trade volumes and a lack of robust data on harvest sustainability. Despite the European ban, pythons continue to be harvested by local people and exported to other markets, primarily in Asia.

Reticulated pythons were selected for the CITES Review of Significant Trade process after CoP15 in Doha. During this review, harvest and export of the species from Malaysia was highlighted as of "possible concern", due to uncertainty about the conservation status and sustainability of international trade in Malaysian snakes. At CITES AC28 in Tel Aviv, Israel, the Animals Committee provided the following recommendations, which must be addressed by Malaysia by 2 June 2016:

- *Provide the Secretariat with the results of the non-detriment finding study due for completion by the end of 2015*, and

- *Establish, in consultation with the Secretariat, a revised annual export quota (including zero quota if appropriate) for wild taken specimen based on the results of the study mentioned above*.

The present report is Malaysia's response to these recommendations. The report has the following objectives:

1) To provide a summary of the biology and trade of reticulated pythons in Malaysia,

2) To provide detailed results of Malaysia's non-detriment findings studies,

3) To present steps taken to revise management protocols and future NDF monitoring programs for reticulated pythons in Malaysia

4) To provide information to support the conclusion of non-detirmnetal trade in reticulated python skins from Malaysia.

A NOTE ON THE CONTENT OF THIS REPORT

Malaysia is comprised of three distinct administrative regions: the east Malaysian states of Sabah and Sarawak on the island of Borneo, and Peninsular Malaysia on mainland Asia (comprised of 11 states). Sarawak does not harvest or export reticulated pythons for trade and Sabah has historically exported only small numbers (< 12,000). Since 2013, Sabah has implemented a quota of 3,000 individuals; however, this quota has not been fulfilled in recent years (S.N.A. Acheh pers. comm. 2015). For this reason, the present report focuses exclusively on the harvest and trade of reticulated pythons in Peninsular Malaysia, where all Malaysian python skins destined for export are sourced. Further details on differentiation of pythons from Sabah and Peninsular Malaysia was provided to the CITES Secretariat and accepted at AC27 in Veracruz, Mexico.

CHAPTER 1: SUMMARY OF RETICULATED PYTHONS AND THEIR TRADE IN PENINSULAR MALAYSIA

Basic Biology

The reticulated python (*Python reticulatus*) is one of the most abundant and widespread animal species in Southeast Asia (Murphy and Henderson, 1987; Auliya, 2006). Reticulated pythons are also the world's longest terrestrial land animal, with recorded lengths of up to 10 metres (Murphy and Henderson, 1987). However, most individuals grow to around 4 meters in length (Shine *et. al.* 1999). Reticulated pythons are habitat generalists, being found in primary and secondary forests, swamps, degraded agricultural lands and even cities, up to the altitude of 1,500 m above sea level (Cox *et. al.* 1998; Auliya, 2006). Available evidence suggests that reticulated pythons have benefitted from the expansion of oil palm plantations throughout their range due to high densities of rodents preyed upon by the snakes (Shine et al. 1999). The retiuculated python is distributed throughout all Malaysian states, and is particularly common in Peninsular Malaysia (Fig. 1).

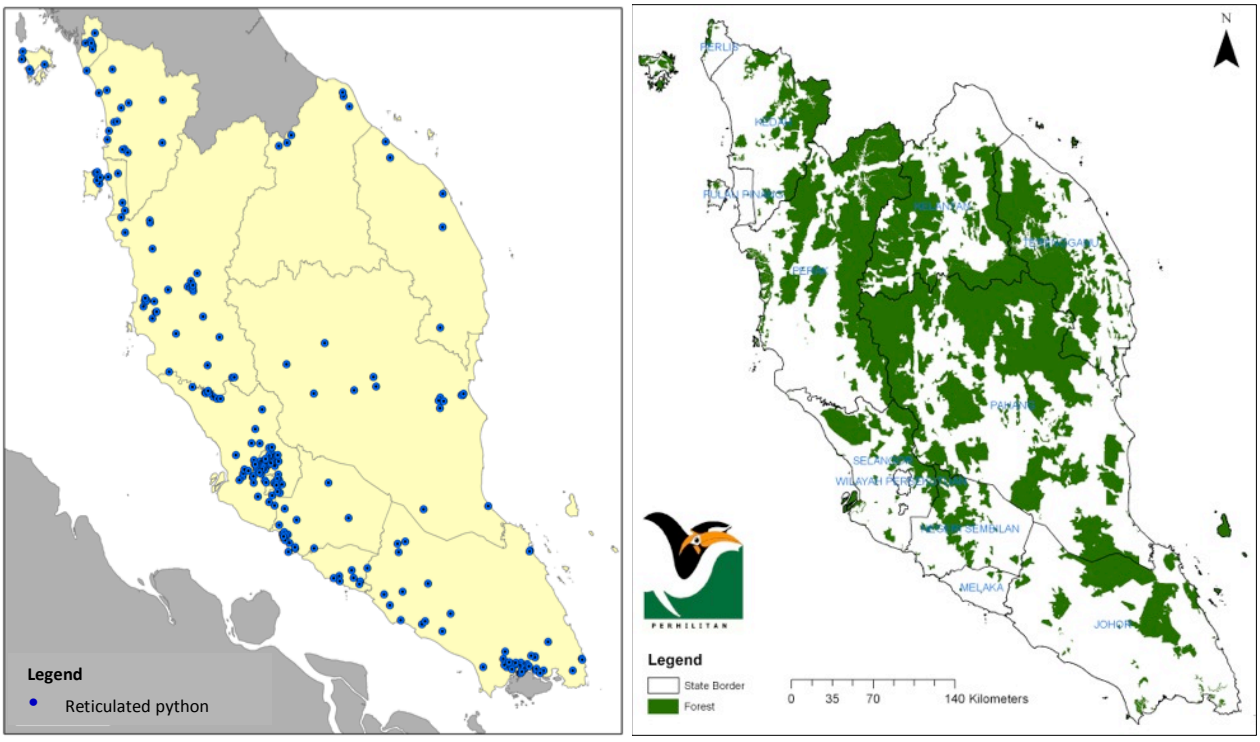


Fig. 1. The distribution of (left) reticulated pythons and (right) forests in Peninsular Malaysia. Data on python locations recorded from inventories, population studies and human-wildlife conflicts. It is reasonable to assume the species is distributed throughout Peninsular Malaysia.

Overview of Trade from Peninsular Malaysia

The skins of reticulated pythons are highly sought after for use in fashion products (e.g., garments and handbags). Other snake-derived products (e.g., byproducts of the skin trade, such as meat and gall bladders) are also traded within local markets. Peninsular Malaysia imposed a voluntary export quota of 180,000 skins in 2005. In 2010, the Malaysian CITES Scientific Authority (the Department of Wildlife and National Parks or PERHILITAN) began an intensive CITES non-detriment findings study on reticulated pythons. As a precautionary measure, and to better reflect export volumes in previous years, in 2011 the export quota was reduced to 162,000 skins per year. Exports have remained stable since that time (Fig. 2).

The Malaysian CITES Scientific and Management Authorities are unable to explain the large fluctuations in trade volumes directly before and after the ban on imports by the European Union. These exports took place at a time when trade regulation was weaker than it is today. For this reason, we are reluctant to draw conclusions about sustainability using these data.

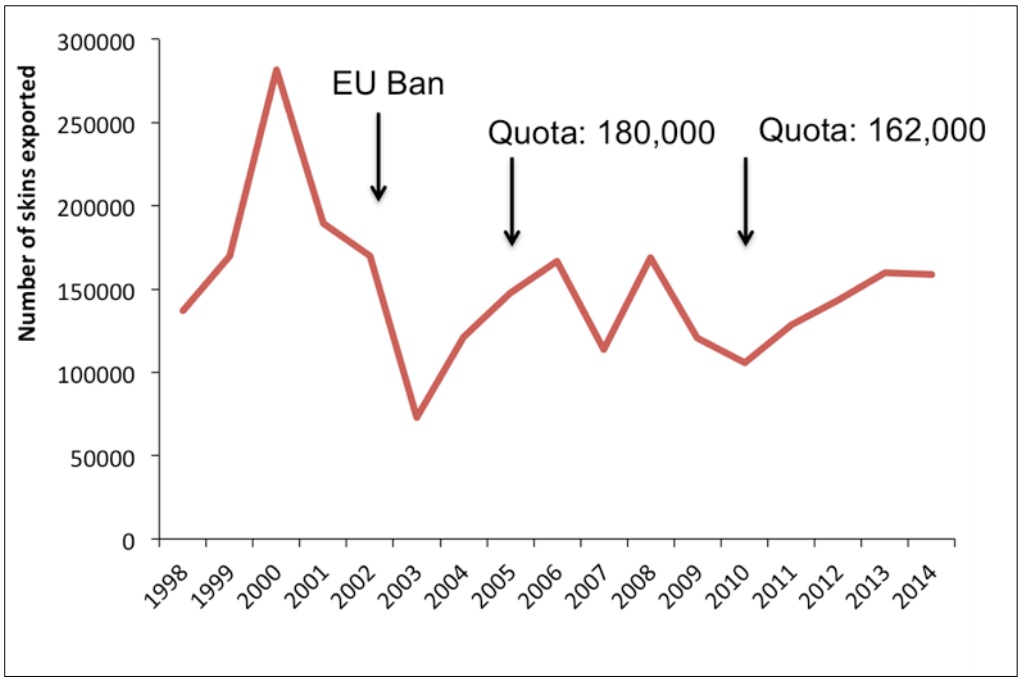


Fig. 2. Annual exports of reticulated python skins from Peninsular Malaysia since 1998. Arrows indicate the years in which significant events took place. EU = European Union.

Hunting and Trade Management

The trade in reticulated pythons is regulated by the Department of Wildlife and National Parks (DWNP) Peninsular Malaysia (*Jabatan Perlindungan Hidupan Liar dan Taman Negara*; PERHILITAN), which acts as the CITES Scientific Authority. Together with the Malaysian Ministry of Natural Resources and Environment (NRE), PERHILITAN also acts as the CITES Management Authority. The reticulated python is a protected species in Peninsular Malaysia, but hunting of the species is allowed by the Wildlife Conservation Act 2010 (Act 716) under the following conditions:

i. Only licensed hunters are legally permitted to catch *P. reticulatus* using nets or by hand. No shooting or destructive methods are allowed. Initially, Malaysia implemented a maximum catch quota of 50 pythons per hunting license, which was valid for three months of the hunting period. When the Malaysian Wildlife Conservation Act 2010 (Act 716) replaced Act 76 in 2010, the cost of hunting licences increased from USD 12 to USD 117 per licence for 50 heads (Federal Government Gazette: Wildlife Conservation (License, Permit and Special Permit Fees) Regulations 2013). However, this sudden substantial increase in fees was disproportionate to the market value of pythons and was revised to USD 24 per licence in 2013 (Federal Government Gazette: Wildlife Conservation (License, Permit and Special Permit Fees) (Amendment) Regulations 2013). Hunting licences are now valid all year with allowable hunting periods between the hours of 0700 to 1900 (Federal Government Gazette: Wildlife Conservation (Open Season, Methods and Times of Hunting) Order 2014).

ii. Hunting licenses issued by a state are only applicable for hunting activities within that respective state. For example, if a hunter collects pythons from both Selangor and Perak States, two licenses are required.

iii. Licensed traders are allowed to source their pythons from licensed hunters or other licensed traders. Every trade transaction must be recorded in a logbook provided by PERHILITAN. Transaction details include the date of transaction, number of pythons, source person (with license number), and remaining stock. Enforcement officers check this logbook regularly.

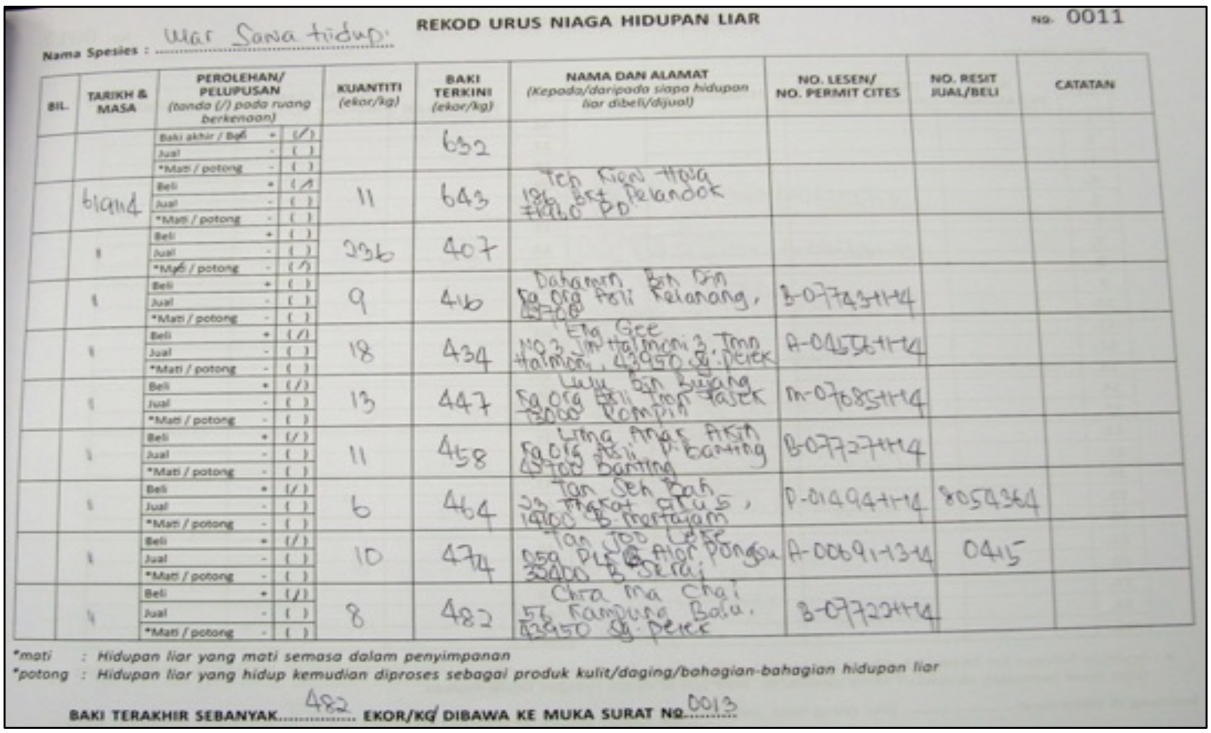
iv. CITES exports are issued by CITES registered offices in Kuala Lumpur, Penang or Johor Bahru. When an application for export is submitted, the exporter is required to make the stock available for examination by officers of PERHILITAN. Officers count and record every single skin destined for export, and seal and stamp the boxes with unique identifiers held by the department. When the exports are checked by customs, any skin not possessing a PERHILITAN stamp, or having a broken seal, are seized.

v. State Government has the right to impose additional regulations via the State's Enactments, as natural resources are considered State-owned. Such an enactment has

been implemented by the Sultan of Johor, who has forbidden hunting of all animals except feral pigs in the state.

Sustainability Monitoring

In addition to hunting licences, PERHILITAN issues logbooks to all python skin traders and requires records of data and aquittals for trade in pythons (Figs. 3 & 4). The information gathered includes the number of snakes purchased and killed for trade, the names and addresses of all hunters selling snakes, and the total body mass of pythons brought to processing facilities. PERHILITAN uses the data gathered to examine trends in harvest numbers, verify hunter details and link the information to enforcement actions taken by the Department.



REKOD URUS NIAGA HIDUPAN LIAR

No. 0011

Nama Spesies : Ular Sawa hidup.

BIL.	TARIKH & MASA	PEROLEHAN/ PELUPUSAN (tanda (/) pada ruang berkenaan)	KUANTITI (ekor/kg)	BAKI TERKINI (ekor/kg)	NAMA DAN ALAMAT (Kepada/daripada siapa hidupan liar dibeli/dijual)	NO. LESEN/ NO. PERMIT CITES	NO. RESIT JUAL/BELI	CATATAN
		Baki akhir / Bef + (/) Jual - ( ) *Mati / potong - ( )		632				
	bland	Beli + (/) Jual - ( ) *Mati / potong - ( )	11	643	Teh Kien Hoa [illegible]			
	〃	Beli + ( ) Jual - ( ) *Mati / potong - (/)	236	407				
	〃	Beli + ( ) Jual - ( ) *Mati / potong - ( )	9	416	Dahaman Bin [illegible] [illegible] Kelanang, [illegible]	B-07743-14		
	〃	Beli + (/) Jual - ( ) *Mati / potong - ( )	18	434	Eng Gee No 3 Jln Halmoni 3, Tmn Halmoni, 43950 Sg. Pelek	A-04556-14		
	〃	Beli + (/) Jual - ( ) *Mati / potong - ( )	13	447	[illegible] Bin Bujang [illegible] Pasek [illegible] Rompin	m-07685-14		
	〃	Beli + (/) Jual - ( ) *Mati / potong - ( )	11	458	[illegible] Banting	B-07727-14		
	〃	Beli + (/) Jual - ( ) *Mati / potong - ( )	6	464	Tan Seh Bah [illegible] 14000 B. Mertajam	P-01494-14	8054364	
	〃	Beli + (/) Jual - ( ) *Mati / potong - ( )	10	474	Tan Joo [illegible] Alor Pongsu 34400 B. Serai	A-00691-13-14	0415	
	〃	Beli + (/) Jual - ( ) *Mati / potong - ( )	8	482	Chia Ma Chai 56 Kampung Baru, 43950 Sg. Pelek	B-07722-14		

*mati : Hidupan liar yang mati semasa dalam penyimpanan

*potong : Hidupan liar yang hidup kemudian diproses sebagai produk kulit/daging/bahagian-bahagian hidupan liar

BAKI TERAKHIR SEBANYAK 482 EKOR/KG DIBAWA KE MUKA SURAT NO. 0013

Fig. 3. An example trader logbook used for record keeping in Peninsular Malaysia. Traders are required to record every trade transaction.

(a)

WILDLIFE TRADING RECORD **No. 0011**

Species Name: Live Reticulated python

No.	DATE & TIME	ACQUIRE/DISPOSE (mark (/) in relevant column)		QUANTITY (heads/kg)	CURRENT BALANCE (heads/kg)	NAME & ADDRESS (to/from who wildlife are bought/sold)	LICENSE NO./ CITES PERMIT NO.	BUY/SELL RECEIPT NO.	NOTE
		Final balance / ~~Buy~~	(/)		632				
		Sell	( )						
		*Dead/slaughtered	( )						
	6/9/14	Buy	(/)	11	643	Tek Kion Hwa, 186 Bukit Pelandok, 71960 PD			
		Sell	( )						
		*Dead/slaughtered	( )						
	"	Buy	( )	236	407				
		Sell	( )						
		*~~Dead~~/slaughtered	(/)						
	"	Buy	(/)	9	416	Dahaman bin Din, Kg Orang Asli Kelanang, 41700	8-0774311-14		
		Sell	( )						
		*Dead/slaughtered	( )						

(b)

WILDLIFE TRADING RECORD **No. 0011**

Species Name: Reticulated python skins

No.	DATE & TIME	ACQUIRE/DISPOSE (mark (/) in relevant column)		QUANTITY (heads/kg)	CURRENT BALANCE (heads/kg)	NAME & ADDRESS (to/from who wildlife are bought/sold)	LICENSE NO./ CITES PERMIT NO.	BUY/SELL RECEIPT NO.	NOTE
		Final balance / ~~Buy~~	(/)		2,043				
		Sell	( )						
		*Dead/slaughtered	( )						
	6/9/14	Buy	( )	236	2,279				
		Sell	( )						
		*~~Dead~~/slaughtered	(/)						

Fig. 4. Translation of the logbook presented in Figure 3 (above), showing information recorded for (a) transactions involving live pythons and (b) their skins. The different logbooks traders are required to keep allows syncronisation and thus verification of information for enforcement purposes.

Traceability

PERHILITAN does not require individual skins to be tagged. Instead, whenever a trader applies to the Department for issuance of CITES permits, the trader must allow Department staff to visit their premises and verify the packaging of the python skins. The boxes of skins are packaged together and closed using a department-issued seal. In some states, the shipment is then escorted to the port by department staff. If the seals are broken or tampered with at any point, the shipment is void and is seized at customs.

CHAPTER 2: THE BASIS FOR NDF – MARK RECAPTURE

Background

In 2010, the Malaysian CITES Scientific Authority (PERHILITAN) initiated an intensive mark-recapture study on reticulated pythons in Peninsular Malaysia. The objective was to census the wild python population, and use the data gathered to inform a precautionary and science-based harvest quota for this species. It was our hope that the results of this research would provide a baseline of reticulated python abundance in Peninsular Malaysia, and allow the Scientific Authority to conduct follow-up monitoring to examine trends in population densities under constant offtake.

***Important note:** PERHILITAN submitted a naïve population density estimate to the CITES Secretariat in 2013. At that time, the field study described herein was still in operation and data were still being gathered and analysed. To comply with the Secretariat's request for information, PERHILITAN submitted brief preliminary results only. Since then, we have gathered a larger amount of data, and have re-analysed those data using a more robust methodology. This has resulted in a change in our original population size estimates.

Methodology

We surveyed five sites for reticulated pythons between 2010 and 2013 (Table 1). Each site comprised two habitat types: (1) secondary forests, and (2) oil palm plantations. One of our sites (Setiu) was chosen as a control site because no hunting licenses have been issued for reticulated pythons in the state of Terengganu. Sabak Bernam was chosen because it is a site of intensive harvest with a high number of snake hunters. The other sites were chosen as intermediately harvest sites.

Table 1. Name and geographic locations of mark-recapture study sites for reticulated pythons in Peninsular Malaysia.

Geographic location in Peninsular Malaysia	Mark-recapture sites
East	Setiu, Terengganu
Mid-West	Sabak Bernam, Selangor
North	Kerian, Perak
East	Pekan, Pahang
North	Kuala Muda, Kedah

Survey Protocols

We used two methods to capture pythons. First, we deployed fishing nets with a maximum mesh size of 3-inches across slow flowing rivers and man-made drainages (Fig. 5). Where possible, we set nets in shaded areas following advice from the licensed hunters who assisted us (captures of pythons are much lower if nets are set in areas of direct sunlight). No bait was used to attract the snakes. Instead, pythons are captured when they swim into the nets and become tangled in the mesh. The second method used to capture pythons was a modified bubu (fish trap), with a trap opening of 3 feet in diameter. Branches with leaves (e.g. of palm trees) were placed on both sides of the bubu and extended to the riverbank (to ensure that any python swimming in the canal is directed to the bubu opening). We baited the traps with live ducklings to attract pythons, which can detect the heat of the prey species. Ducklings were provided food and monitored for well-being throughout the study.

Fig.5. Nets and fish traps deployed in small drainages to capture pythons

We checked all nets and fish traps twice per day for one week. At each site we deployed 20 nets and 10 fish traps (divided evenly between the two habitat types), with a distance of 250 metres between each net and trap. This corresponded to a linear survey distance of 3.75 km per habitat type. To obtain a survey area measurement, we assumed that pythons would travel to and use canals from the surrounding landscape. Canals in our survey landscapes (secondary

forest and oil palm plantations) are built parallel to one another with a mean distance of 50 m between them. We assumed that pythons would travel to and use the canals nearest to them. Therefore, we assumed a working survey width of 50 m (25 metres either side of the canal in which we established our nets and fish traps). Thus, we surveyed 0.1875 km^2 in each habitat type (3.75 km x 50 m). To establish a naïve population density estimate we divided the total number of pythons captured by the survey area in each habitat. We assumed equal catchability within drainages in both habitat types at all sites.

Once pythons were captured, we marked all individuals using a passive intergrative transponder (PIT) tag to allow identification on subsequent encounters. In addition, we clipped the ventral scales of all snakes in a unique configuration as a back-up (Fig. 6). For every snake we also recorded the following morphological data: sex, head length (HL, mm), snout-vent length (SVL, mm), tail-length (TL, mm), and body mass (BW, g). We sexed pythons by inserting a steel probe into the cloacal bursae and recording probe depth. Saliva and blood samples were also collected and deposited at Wildlife Genetic Resources Bank (WGRB) for future references in DNA analysis.

Fig. 6. Ventral scale marking of reticulated pythons as part of a study in Peninsular Malaysia.

Results

In 2010 we captured four pythons within secondary forest and three pythons in oil palm plantations (Table 2). No snakes were captured in Kerian and no recaptured were recorded. Due to the small sample sizes despite the high catch effort, sampling was repeated at the same sites in 2011. In 2011 we captured six pythons in secondary forest and five in oil palm plantations (Table 2). There was also no recapture record for this year. In order to derive a more presentable estimate for the python population in Peninsular Malaysia, sampling was widened to additional sites in the following year. We established a mark-recapture study site in Pahang (a state in east Peninsular Malaysia) and Kuala Muda, which is located further North-west

(Table 1). Sampling days and catch effort for 2012 was the same as the previous year. Similar to the two previous years, only a small number of pythons were captured in 2012 (Table 2).

Table 2: Records of python caught during mark-recapture studies between 2010 and 2012.

Year	Site	Sex	Habitat	Method	TOL (mm)	TL (mm)	SVL (mm)	HL (mm)	BW (g)
2010	Sabak Bernam	Female	Secondary forest	Net	2,740	400	2,340	60	6,500
		Female	Secondary forest	Net	3,570	530	3,040	90	12,200
		Male	Secondary forest	Bubu	3,780	530	3,250	110	15,500
		Female	Oil palm plantation	Net	2,860	410	2,450	90	5,500
	Setiu	Female	Secondary forest	Bubu	3,218	423	2,785	96	10,500
		Female	Oil palm plantation	Bubu	3,200	435	2,765	90	7,350
		Female	Oil palm plantation	Bubu	3,400	451	2,949	109	9,500
	Kerian	No captures							
2011	Sabak Bernam	Female	Secondary forest	Net	3,210	420	2,790	90	11,000
		Female	Secondary forest	Bubu	3,954	504	3,450	117	15,700
		Male	Secondary forest	Net	2,860	399	2,461	80	7,000
		Female	Secondary forest	Bubu	3,882	365	3,517	115	21,100
		Male	Oil palm plantation	Net	3,035	445	2,590	95	9,000
		Female	Oil palm plantation	Net	2,736	373	2,363	75	5,100
		Female	Oil palm plantation	Net	3,090	495	2,595	89	8,600
	Setiu	Female	Oil palm plantation	Bubu	3,400	451	2,949	109	9,500
	Kerian	Male	Secondary forest	Bubu	3,220	370	2,850	110	9,600
		Male	Secondary forest	Net	3,270	460	2,810	90	7,900
		Female	Oil palm plantation	Bubu	3,425	483	2,942	100	12,500
2012	Pekan	Male	Oil palm plantation	Net	3,010	425	2,585	95	9,000
		Male	Oil palm plantation	Net	3,020	420	2,600	100	7,000
		Female	Oil palm plantation	Net	3,317	459	2,858	110	9,100
		Male	Oil palm plantation	Net	2,850	385	2,465	90	5,900
	Kuala Muda	Male	Secondary forest	Net	3,225	420	2,805	90	9,000
		Male	Secondary forest	Bubu	3,640	540	3,100	100	9,090

We used the basic results from surveys between 2010 and 2012 to derive a naïve estimate of population size for reticulated pythons in Peninsular Malaysia. Naive estimates were calculated based on the number of pythons at all study sites for each habitat, divided by the total coverage of those habitat types in Peninsular Malaysia (Table 3).

Table 3. A naïve population estimate for reticulated pythons in Peninsular Malaysia, 2012.

Habitat type coverage	**Estimated Individual/km^2**	**Naïve population estimates (individual)**
Forest (61,555 km^2)	5-21	307,775 – 1,292,655
Oil palm plantation (29,157 km^2)	5-21	307,775 – 612,297
Total		**615,550 – 1,904,952**

To improve our density estimates, in 2013 we increased our catch effort to 10 days and deployed 100 nets and 20 fish traps at each sampling site (divided equally between the two habitat types). This resulted in a linear survey distance of 15 km. Mulitplied by the width of the survey area (50 m), we assumed a total survey area of 0.75 km^2. We observed a significant increase in the number of snakes captured at all sites except Sabak Bernam (which underwent significant land modification in that year; Table 4).

Table 4: Records of python caught during mark-recapture study in 2013. Note: *R represent recapture occasion recorded for this python.

Year	Site	Sex	Habitat	Method	TOL (mm)	TL (mm)	SVL (mm)	HL (mm)	BW (g)
2013	Kuala Muda	Female	Secondary forest	Bubu	3,800	490	3,310	110	15,000
		Male	Secondary forest	Net	3,250	355	2,895	95	9,100
		Male	Oil palm plantation	Net	2,570	360	2,210	70	5,000
		Male	Oil palm plantation	Net	2,950	385	2,565	85	8,500
		Male	Oil palm plantation	Net	2,560	360	2,200	65	5,500
		Female	Oil palm plantation	Net	2,930	405	2,525	80	7,500
		Female (*R)	Oil palm plantation	Net	2,790	420	2,370	75	8,000
		Female	Oil palm plantation	Net	3,400	430	2,970	90	11,000
		Female	Oil palm plantation	Net	2,990	400	2,590	110	7,700
		Female	Oil palm plantation	Net	2,390	340	2,050	80	5,000
		Male	Oil palm plantation	Net	2,520	690	1,830	70	5,000
		Female	Oil palm plantation	Net	2,490	330	2,160	70	5,000
		Male	Oil palm plantation	Net	2,350	340	2,010	70	4,400
		Female	Oil palm plantation	Net	2,820	400	2,420	90	6,400
	Sabak Bernam	Male	Oil palm plantation	Bubu	3,480	500	2,980	100	12,600
	Kerian	Male	Secondary forest	Net	3,490	450	3,040	110	9,500
		Female	Secondary forest	Net	2,690	345	2,345	70	5,000
		Male	Oil palm plantation	Net	2,880	360	2,520	75	5,500
		Male	Oil palm plantation	Net	3,460	490	2,970	80	12,500
		Male	Oil palm plantation	Net	2,570	355	2,215	80	6,200
		Female	Oil palm plantation	Net	1,840	410	1,430	90	7,900

In the final year of surveying, we re-calculated the naïve population estimate for reticulated pythons in Peninsular Malaysia. The results are presented in Table 5.

Table 5: A naïve population estimates of reticulated python in Peninsular Malaysia, 2013.

Habitat type coverage	Estimated Individual/km^2	Naïve population estimates (individual)
Forest (61,555 km^2)	2-3	123,110 – 184,665
Oil palm plantation (29,157 km^2)	2-16	58,314 – 466,512
Total		**181,424 – 651,177**

Conclusion

Our four-year study yielded some interesting results. Overall, capture rates in oil palm plantations were higher than in forested areas (29 in oil palm *vs*. 16 in forest), despite similar sampling effort. Although our data are not sufficient to conclude that python densities have increased in this habitat type, at the very least we know that oil palm plantations do provide suitable habitat for this species.

So what is the size of the python population in Peninsular Malaysia? Our two sampling periods provided markedly different results, but we are reluctant to draw conclusions about the impact of harvesting or the suitability of the current quota (162,000). Extrapolation of our naïve estimates suggest that the python population in Peninsular Malaysia is anywhere between 181,424 and 1,904,952 individuals. However, we strongly doubt the accuracy of these estimates, and suspect the total population may be considerably higher. These doubts are probably justified. For example, our results suggest that absolute numbers of pythons is higher in harvested compared to non-harvested areas; this is an immensely improbable situation. Furthermore, other population estimates for large-bodied snakes suggest much higher densities (Luiselli, 2006), including for tropical pythons in similar habitats (Natusch and Natusch, 2011).

Other attempts at calculating population density for reticulated pythons have faced similar difficulties to our study (Abel, 1998; Riquier, 1998; Auliya, 2006). The biological traits of pythons and the habitats they occupy create a number of logistical impediments when attempting to enumerate underlying abundances. Our low capture rate and single recapture preclude the use of proper mark-recapture statistical analyses, and only allow a crude naïve estimate to be calculated. Such an estimate is fraut with biases, which further decreases the reliability of our results. For example:

- We captured pythons within watercourses, which make up a relatively tiny proportion of the area at our study sites. Because we do not know the frequency by which pythons utilise these watercourses, we may well be under or overestimating python abundance.

- Attempting to capture pythons using nets resulted in a highly skewed size demographic. All of the 45 pythons we captured were between 230 and 380 cm in length. However, juvenile reticulated pythons measure approximately 80 cm in length, and grow to more than seven metres. Therefore, we failed to capture 75% of the known body sizes present in the population. Although large individuals probably occur at low frenquenies throughout the species' range, we should expect high numbers of juvenile specimens. These results strongly suggest that python densities at our sampling sites (of all sizes) are much larger than estimated here.

- Pythons are remarkably cryptic, and are known to spend considerable periods of time in single locations (sometimes months; Slip and Shine 1988; Shine et al. 1998). The short duration of our study means many snakes were probably not moving (and thus could not be captured) during our trapping period. Yet, our density estimates assume we captured all individuals present within the survey area at that time.

- Our estimates included only forested areas and oil palm plantations, because we did not survey other habitat types. Yet pythons are known to occupy other habitat types (including urban areas), which add another 39,000 km^2 (and potentially another 819,000 pythons) to our estimates.

Taking these caveats into account, it is clear that even our modest population estimates are considerably higher than the annual harvest quota of 162,000 pythons per year. Ultimately, however, we must conclude that mark-recapture field studies do not bring us any closer to making a proper assessment of python population sizes in Peninsular Malaysia, and hence the impact of different harvest regimes on population persistance. Coupled with the need to expend substantial resources in order to undertake such studies, the DWNP has explored other ways to undertake assessments of non-detrimental harvests. This has led us to the studies described below (see Chapter 3).

CHAPTER 3: BASIS FOR NDF - MONITORING HARVEST DEMOGRAPHICS

Introduction

Based on discussions with members of the IUCN SSC Boa and Python Specialist Group in 2012, to improve our NDF procedure we began collecting biological data from harvested pythons and monitoring python processing facilities. If data are collected continuously, then inferences can be drawn from the harvest itself in a similar fashion to fisheries management. Changes in the demographics of the harvest can signal potentially deleterious changes to wild python populations and allow us to take a precautionary approach by amending management protocols. Several authors have sugesst harvest monitoring to be the most useful method for assessing the sustainability of reticulated python harvests (Shine et al. 1998; Natusch pers. comm. 2012; Kasterine et al. 2012). The results of our investigations are presented here.

Methodology

Between 2012 and 2016 we visited five processing facilities to collect data from reticulated pythons harvested for trade. We evenly spaced our visits throughout the year and focused our effort on sites where the highest volumes of trade were occurring (and thus where most data could be gathered, to draw the strongest inference about the overall trade). At each processing facility we recorded snout-vent length (SVL), tail length, and body mass of pythons immediately after they were killed. After skinning, we examined the python's carcasses to determine sex and reproductive condition (by direct inspection of the gonads; Fig. 7). We classified males as mature if they had convoluted efferent ducts (indicating the presence of sperm). We classified females as mature if they had thickened muscular oviducts, vitellogenic ovarian follicles (classified based on size and colouration), and primary follicles larger than 8 mm in diameter and/or corpora albicantia from previous reproductive events.

At each site we tagged a sample of skins to determine the relationship between the SVLs of live pythons and their dried skins. We measured the length and width (at the widest point) of each skin using a steel ruler. We also measured the width of a mid-body ventral scale and an adjacent dorsal scale using digital calipers (see Figure 21 for an example).

Fig. 7. Department of Wildlife and National Parks staff conducts research and monitoring on the demographics of harvested pythons in Peninsular Malaysia (left). The thickened oviduct of a female reticulated python indicates sexual maturity has been reached.

Results

Over a period of five years we collected biological data from 8,513 reticulated python harvested for trade in Peninsular Malaysia. Our results are summarized below.

Sex ratios

In most years, more males were harvested than females, except for 2014 (when the ratios were equal; $\chi^2 = 84.1$, df = 3, $P < 0.0001$; Fig. 8). A male-skewed harvest likely aids sustainability, as males are generally less important for population persistence (a single male can mate with multiple females).

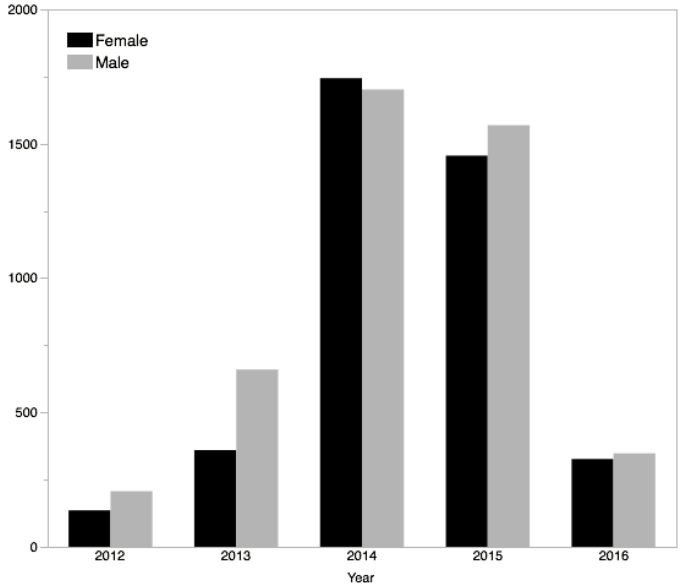


Fig. 8. Realtive number of male and female reticulated pythons brought to processing facilities in peninsular Malaysia between 2012 and 2016.

Trends in body sizes

Similar to other sites within the species range, female reticulated pythons in Peninsular Malaysia grow to larger mean adult body sizes than males (both in terms of SVL: 2.7 *vs*. 2.6 metres, and body mass: 8.0 *vs*. 7.4 kg). Females also reached greater maximum sizes than males, with all individuals larger than 4.3 m SVL being females. Over the five years of monitoring, the mean size of both male and female reticulated pythons increased slightly (in terms of SVL and body mass; Figs. 9 & 10).

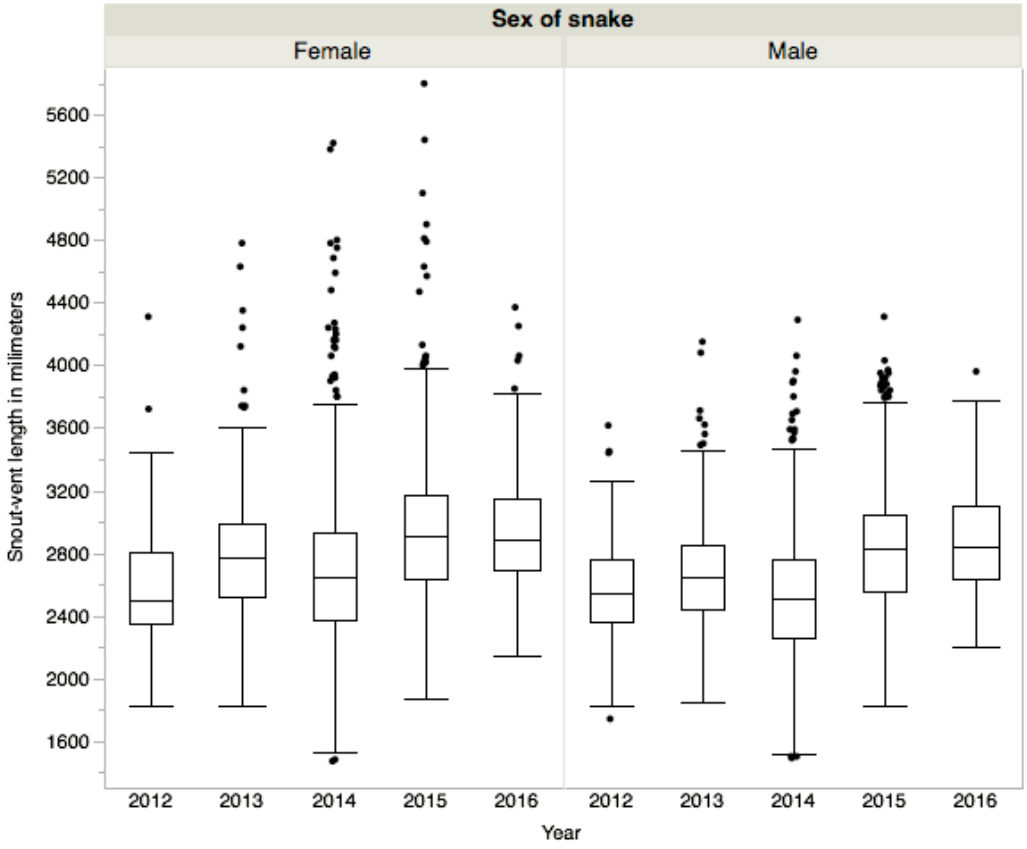


Fig. 9. Annual variability in the snout-vent lengths of reticulated pythons brought to python processing facilities in Peninsular Malaysia between 2012 and 2016.

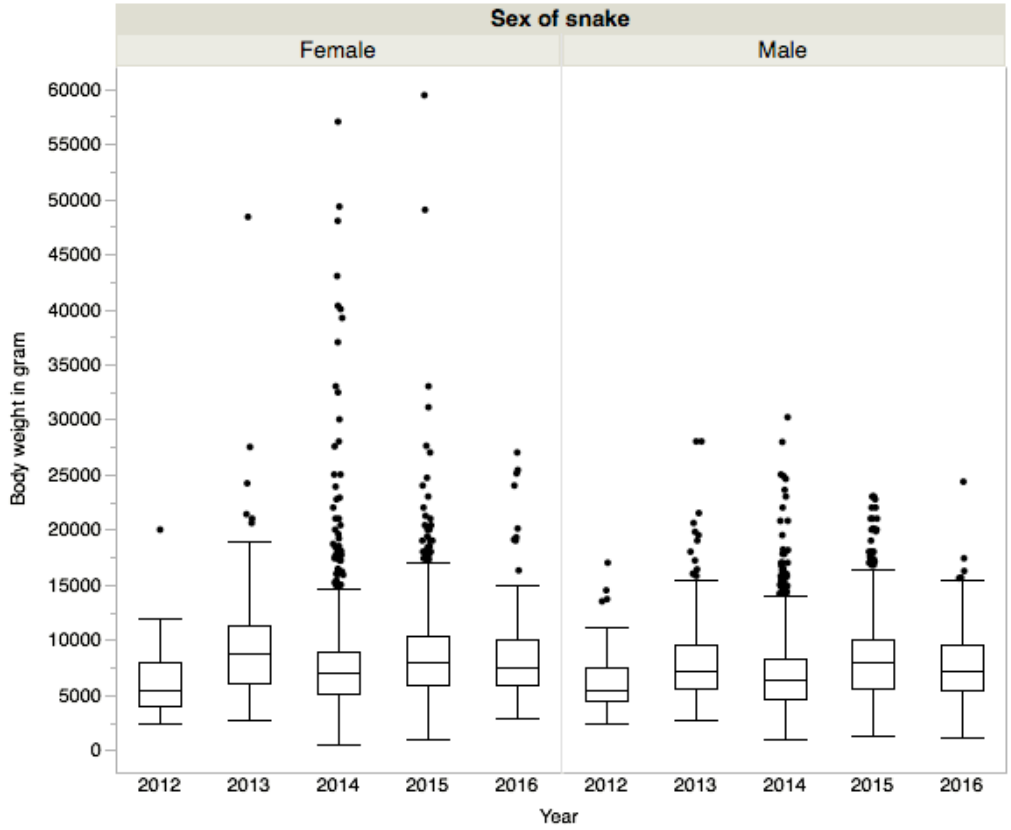


Fig. 10. Annual variability in the body mass of reticulated pythons brought to python processing facilities in Peninsular Malaysia between 2012 and 2016.

Sizes at sexual maturity

The smallest sexually reproductive snakes in our sample were 183 cm and 234 cm SVL for males and females, respectively. In fact, none of the males brought to processing facilities were immature. However, 25% of the females in our sample had not undergone a reproductive event by the time of harvest (Fig. 11). We estimated the size at which 50% of the females in our sample will undergo a reproductive event (hereafter SVL_{50}). We did this using the proportions of mature pythons that were grouped in 10 cm length cohorts, which was best described (evaluated using AiC Criterion) by a two-parameter logistic function:

$$P_M = [1 + e(-a\ (L - b))]^{-1}$$

where P_M = estimated proportion of mature pythons, L = SVL of pythons (cm) and a and b = coefficients that define the shape and position of the fitted curve. We used JMP Pro 11 (SAS Institute, Cary NC) to calculate the observed mature proportion, its predicted probability and coefficients of the logistic equation. We estimated SVL_{50} using JMP's negative ratio tool by substituting $P_M = 0.5$ into the equation above and solving for L. Our analysis revealed that SVL_{50} is reached at approximately 257.8 cm SVL (SE = 1.94; 95% confidence intervals = 254.0 – 261.6 cm SVL; Fig. 12)

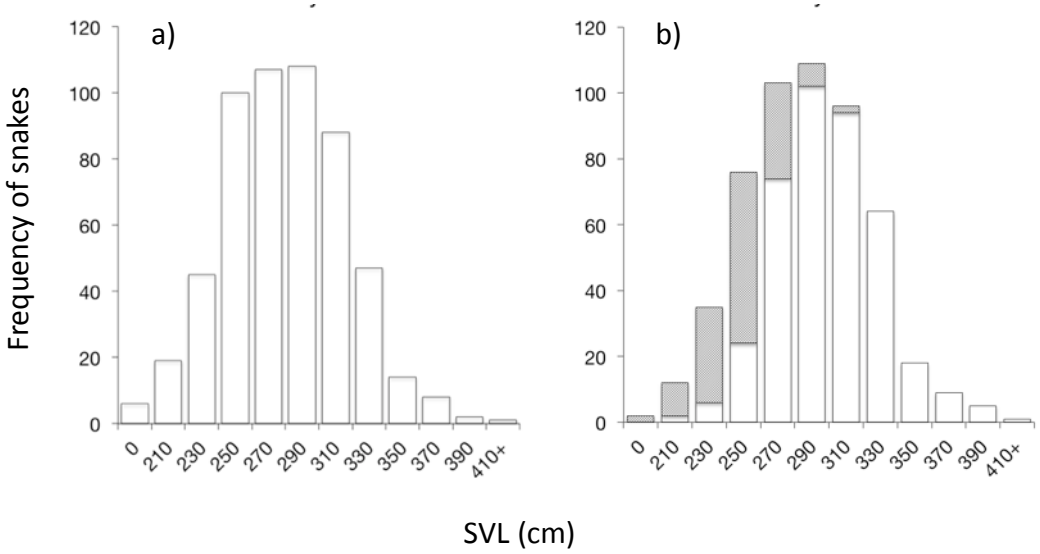


Fig. 11. Body size distributions of (a) male and (b) female reticulated pythons examined at processing facilities in Peninsular Malaysia. Grey areas of columns represent sexually immature individuals, whereas hollow columns represent reproductive adults. Note: All males in the sample were mature.

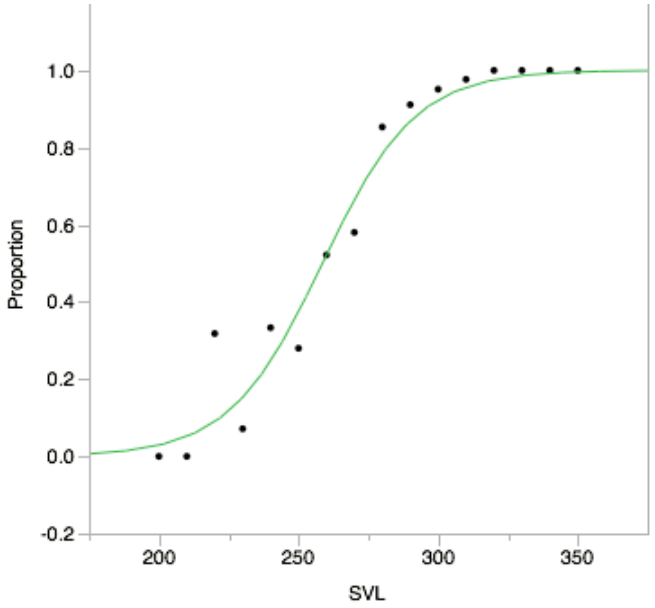


Fig. 12. Proportion of sexually mature female reticulated pythons within different size cohorts in Peninsular Malaysia.

Fecundity

Reticulated pythons are capable of producing large clutches of eggs. The mean clutch size of reticulated pythons in our sample was 20 eggs. Fecundity was strongly influenced by maternal body size, with larger females producing more eggs than smaller females (Fig. 13).

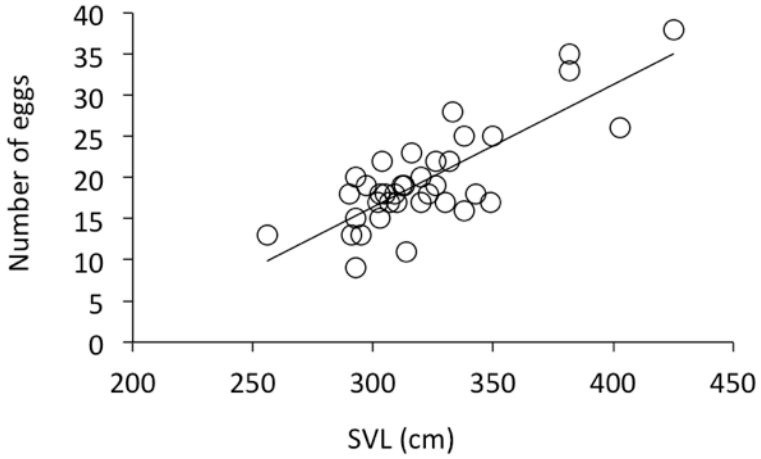


Fig. 13. Relationship between maternal snout-vent length and clutch size in reticulated pythons from Peninsular Malaysia.

Conclusion

The results of the monitoring program undertaken herein are consistent with previous work in Indonesia suggesting that reticulated pythons possess a suite of attributes that make them resilitant to harvesting (Shine et al. 1999). Malaysian pythons mature rapidly and produce large litters of large eggs. In most years, harvests favoured male snakes, which are less important than females for population persistence (a single male can mate with many females).

Over the five-year period of our study, the body sizes of pythons increased slightly. If the python population were suffering the effects of overexploitation we would expect to see a decrease in the mean body size of harvested snakes. Nevertheless, we would require data sets over a longer time period to interpret these trends with greater confidence.

By continuing this type of data collection, we can collect important information on sex ratios, numbers of snakes brought to processing facilities, fecundity, body sizes and sizes at sexual maturity. Any observed changes in these attributes allow us to rapidly implement more precautionary management protocols to limit the number of snakes being harvested (see Chapter 5). The ability to cost-effectively gather such enormous amounts of data massively increases the statistical power of our analyses in a way that cannot be achieved using population field studies.

CHAPTER 4: BASIS FOR NDF - ASSESSMENT OF SUSTAINABILITY THROUGH STAKEHOLDER INTERVIEWS

Introduction

In many parts of the world, wildlife managers are drawing upon indigenous knowledge to learn more about species bioloigy and inform management (Horowitz, 1998). To deepen our understanding about the perception of harvesting on wild populations of reticulated pythons, we carried out a livelihoods survey in 2011 and again in 2015 (in collaboration with the Python Conservation Partnership). The aim of the study was to utilise local stakeholder knowledge in an attempt to identify temporal trends in attributes of python harvesting.

Methodolgy

In 2011, we conducted a survey of households working in the python skin trade. The survey focused on collecting information to better understand the livelihoods of those participating in the trade (including hunters, processors and exporters), and asked several questions related to perceptions of sustainability and steps taken to enhance sustainable offtake. The survey was semi-structured (respondents are allowed to provide their own answers) and data collection was carried out through in-depth face-to-face interviews (Fig. 14). PERHILITAN officers led the identification of survey participants using local licence records, in addition to recommendations from processing facility owners. Responses were gathered from 32 hunters and 19 traders or processing facility owners.

In 2015, in collaboration with the IUCN-SSC Boa and Python Specialist Group and the International Trade Centre (as part of the Python Conservation Partnership), we repeated the livelihoods surveys. Surveys were conducted at 52% (12/23) of the registered processing facilities in Peninsular Malaysia and included approximately 5% (42/948) of registered python hunters. A total of 80 trade participants were surveyed. All households had a minimum of one member currently involved in the python skin trade, including those working as hunters (n=42), agents (n=3), employees (n=20) and facility owners/managers (n=15). These group can be broadly catergorised as follows:

- ***Hunters:*** People involved in collecting pythons from wild sources, including forests, palm plantations and village areas.
- ***Agents:*** People involved in collecting pythons from hunters for delivery to processing facilities. Typically employed by the facility.
- ***Employees:*** People working at python processing facilities, including processors, skin pinners (people working to pin python skins to wooden boards for drying), skin packers and office administrators.

- ***Facility Owners/Managers:*** People that own or manage python processing, tanning and/or export facilities.

Fig. 14. Interview session with a trader and hunters in Perak, Peninsular Malaysia.

Results and Discussions

In 2011, slightly more hunters claimed that python populations had remained stable over the previous five years than those who thought a decline had occurred (Fig. 15). A similar trend was evident during the 2015 survey, with approximately equal numbers claiming their catch rates had increased, decreased and remained unchanged over the past five years (Fig. 17). Many hunters probably provided answers based on their recent experiences, or did not keep accurate records of numbers captured. The opinions of processing facility owners (who deal in far greater volumes of snakes, for much longer periods), would provide more robust indicators of the trends in python populations. Of the facility owners interviewed, all but two claimed that the number of snakes harvested annually had increased (3/15) or stayed the same (10/15). The two that claimed numbers collected had decreased cited reduced demand, and thus hunting effort. However, processing facility owners may also have a vested interest in claiming harvests are sustainable, highlighting the need for ongoing and independent monitoring of the numbers and body sizes of harvested snakes.

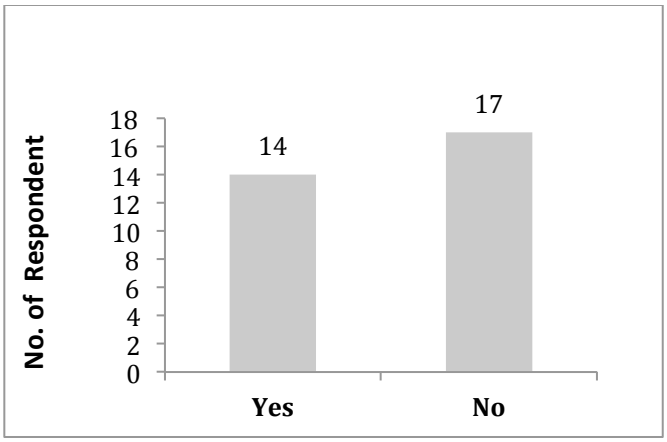


Fig. 15. Responses of hunters in Peninsular Malaysia when asked if the number of pythons captured annually had decreased over the past five years (n = 31). From surveys in 2011.

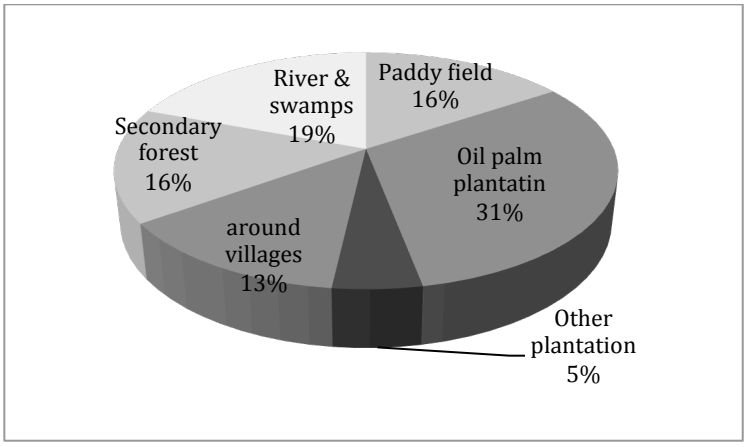


Fig. 16. Responses of reticulated python hunters in Peninsular Malaysia when asked where they primarily hunt pythons (n = 32). From surveys in 2011.

In summary, harvesting undoubtedly results in localised declines in python density at specific sites, which is probably noticed by hunters. However, the mixed result in perceptions likely reflects the seasonal changes python populations undergo, and the varying spatial dynamics of hunter harvest areas, rather than long-term population declines across Peninsular Malaysia. Available evidence suggests that the development of a large-scale palm oil industry in Malaysia has benefited pythons, which are common in artificially constructed canals on the plantations and thrive on the high abundance of rats that feed on palm kernels (Shine et al 1999; Natusch pers. comm.). Indeed, our own mark-recapture study (see Chapter 2) confirmed that pythons are abundant in oil palm habitats. In keeping with this conclusion, most hunters claimed to capture pythons primarily from oil palm plantations (or villages and swamps) rather than natural forest areas (Fig. 16). Furthermore, our data from examination of the biological attributes of harvested pythons (See Chapter 3) revealed that the stomach contents of 3,701 snakes brought

to Malaysian processing facilities consisted almost entirely of rice field rats and a range of domesticated animals (chickens, goats, dogs and cats) rather than more "exotic" prey that would be expected in snakes collected from primary forests (Natusch pers. comm. 2016).

Only 12% of hunters believed that python sizes had increased over the past five years, with most believing they had decreased (29%) or were unchanged (59%)(Fig. 17). Two long-term hunters commented, *"Over the years it has become more difficult to catch large snakes"* and believed that forest clearing had left large pythons with a reduced supply of large prey items. Others believed that large pythons were mostly found in the forest, but high numbers of smaller pythons are found in palm plantations, which offer a productive breeding ground. We suspect this interpretation is correct. The relative homogeneity of oil palm plantations compared to natural forest provides fewer hiding places for large pythons, which are detected by hunters more easily. However, this is probably only true for giant pythons (those > 4 metres). Hunters confirmed this situation when the question was clarified, with several hunters claiming that: "*the average size of snakes has remained the same, but giant snakes are less common*". As with absolute numbers of snakes, however, direct measurements of snakes brought to processing facilities will provide much more accurate estimates of body size changes than the perceptions of single hunters.

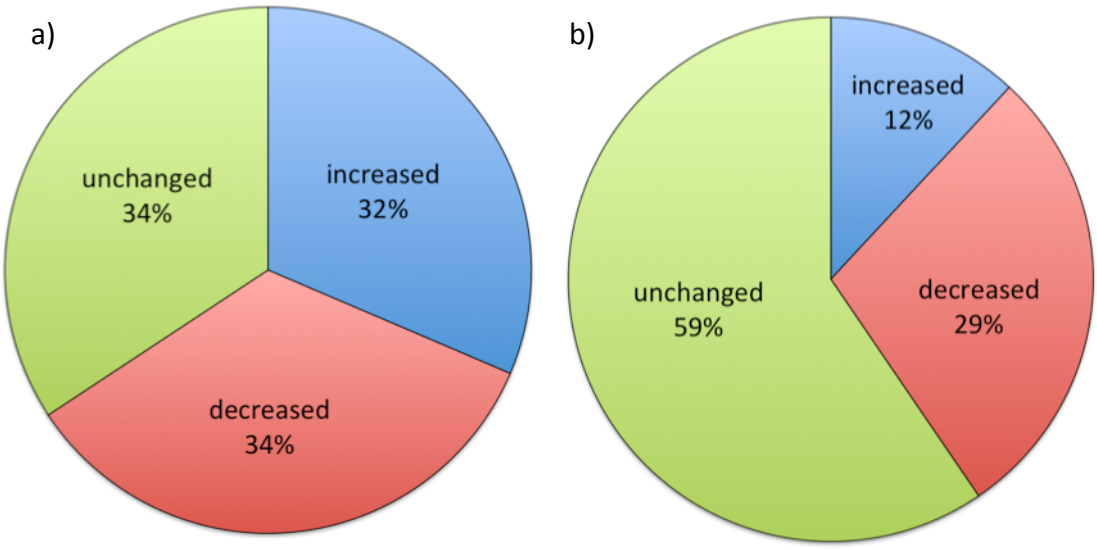


Fig. 17. Perceptions of hunters about whether the (a) number and (b) sizes of pythons collected over the past five years has changed. From surveys in 2015.

More than half of python hunters surveyed (57%) said they take specific actions towards maintaining a sustainable supply of python skins. A reported 31% rotate hunting areas and 10% only catch larger pythons. One hunter also mentioned that he does not catch gravid snakes. That being said, it is likely that many hunters have not considered the relationship between hunting and wild population levels, and consequently their livelihood security.

Processing facility owners were also conscious of maintaining healthy python populations, and many allowed gravid (pregnant) females to incubate their eggs before being processed. The resulting hatchlings are then released into nearby habitats to aid population recruitment. In addition, the two largest processing facilities refrained from buying large snakes (those greater than 5 m), preferring to focus on the more abundant (and less fecund) smaller pythons (with higher quality skins).

When asked what trade participants would do if Malaysia implemented a complete ban on python hunting, 90% (38/42) of hunters claimed that it would significantly impact their livelihoods. However, only 48% (20/42) said it would have a significant impact on their wellbeing. These individuals suggested that they would have "*nothing else to do*", or "*will not be able to survive*". The remainder simply claimed that they would need to find alternative employment. This probably reflects the somewhat opportunistic nature of their participation in the trade. By contrast, 94% (14/15) of managers and business owners claimed that it would "*ruin their lives*", as they are heavily invested in the industry. Several trade participants claimed they would continue to hunt illegally, because of the threat pythons posed to livestock and children in village areas. When asked about the likelihood of a complete ban on python hunting, responses were mixed, but most claimed that it would be unlikely (Fig. 18). When asked why they thought it was unlikely, most respondents said that python populations were still very high, while others claimed that harvesting was necessary to prevent python populations becoming too large.

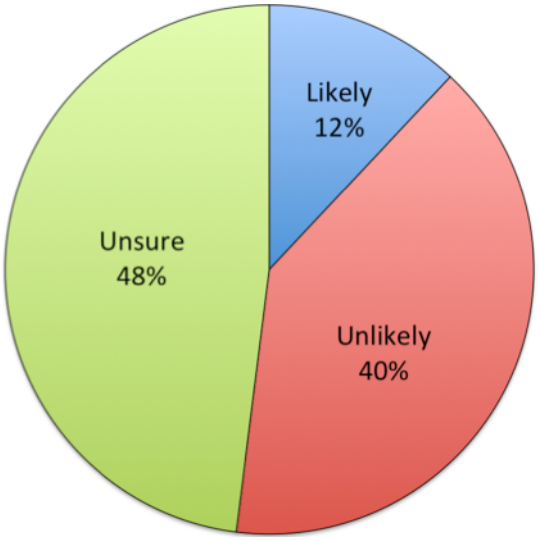


Fig. 18. Perceptions of hunters and processing facility managers about the likelihood of a complete ban on python trade in Peninsular Malaysia. From surveys in 2015.

CHAPTER 5: IMPROVING MONITORING AND MANAGEMENT

Introduction

The DWNP of Peninsular Malaysia (PERHILITAN) has worked hard to implement a robust system of management for the harvest and trade of reticulated python skins. In addition to the system currently in place, the following changes will be made to further improve the management and regulation of trade, and increase confidence that harvests continue to be non-detrimental to the survival of the species in the wild.

Modification of Harvest Management

As of 2017, a quota will no longer be the sole tool used to manage harvests of reticulated pythons in Peninsular Malaysia. In addition to a quota, a restriction will be placed on the minimum sizes of pythons that can be leglly captured. Harvests of yellow anacondas in Argentina are successfully managed in this way (Waller et al. 2011). The rationale for amending Malaysia's harvest manegement strategy is as follows:

Quotas are arbitrary unless underpinned by robust science. - Harvest quotas are a useful tool for regulating trade if set at sustainable levels. Sustainable quotas can be achieved either through knowledge of vital population input and output parameters (usually determined by field studies) or through experimentation and monitoring to ensure populations are not declining (Sutherland, 2001). However, as described in Chapter 2, Malaysia's attempts at enumerating underlying python abundances were fraught with difficulty and potential biases, making it almost impossible to determine population rates. Similarly, the difficulty in monitoring cryptic species, and the complex nature of trade, also makes setting sustainable harvest limits using trial and error problematic (Sutherland, 2001). Setting quotas too low can result in compliance problems; setting quotas too high may compromise harvest sustainability.

Quotas don't account for natural population fluctuations. - Populations of all species fluctuate for a variety of reasons, which quotas do not account for (Sutherland, 2001). When years are favorable and populations are high, quotas create incentives for traders to smuggle or launder excess skins through other countries, or keep skins for a bad year in order to "meet the quota". A fixed quota that is above the numbers easily produced during a bad year can also foster an increase in hunting effort and prices to "meet the quota", potentially rendering the harvest unsustainable (Copes, 1986; Sutherland, 2001).

Quotas do not discriminate vulnerable life-stages. - The sustainability of harvests is strongly influenced by the type of animals being captured for trade. For example, a harvest that focuses primarily on immature males is more likely to be sustainable than one that focuses on reproductive females (Shine et al. 1999). Restricting harvests to a specific subset of a

population can thus aid sustainability; however, if used in isolation, quotas do not confer these benefits.

Quotas can mask real trade levels. - Even if quotas are set at sustainable levels, it is impossible to determine actual harvest levels if they are being illegally exceeded (because of the clandestine nature of illegal trade). The consequence of such data fouling is that a harvest may be unsustainable, but that knowledge is masked (Sutherland, 2001).

Quotas cannot be easily enforced. - If illegal trade is occurring, determining whether a particular skin is "within" or "in excess of" an assigned quota is rarely possible without other measures in place. Therefore, quotas are only useful if traders abide by them and authorities can enforce them (Copes, 1986).

By contrast, implementing a minimum size restriction confers the following benefits for sustainability and trade regulation:

- Minimum size restrictions protect immature pythons, allowing a greater proportion of individuals to undergo a reproductive event before being harvested,

- Creates a natural cap on the number of pythons capable of being captured annually, because of the finite number of individuals within size cohorts,

- Accounts for natural population fluctuations, and

- Measurement of skin sizes can be used to easily enforce harvest size limits.

As a first step towards implementing a minimum size restriction, Malaysia will no longer allow the hunting and capture of reticulated pythons smaller than 240 cm snout-vent length. This is a precautionary yet practical size, which is slightly smaller than the mean size at which 50% of female reticulated pythons have undergone a reproductive event (Fig. 12). Based on our data of the demographic composition of harvested pythons (see Chapter 3), such a limit will reduce the total volume of trade by 13% (Fig. 19).

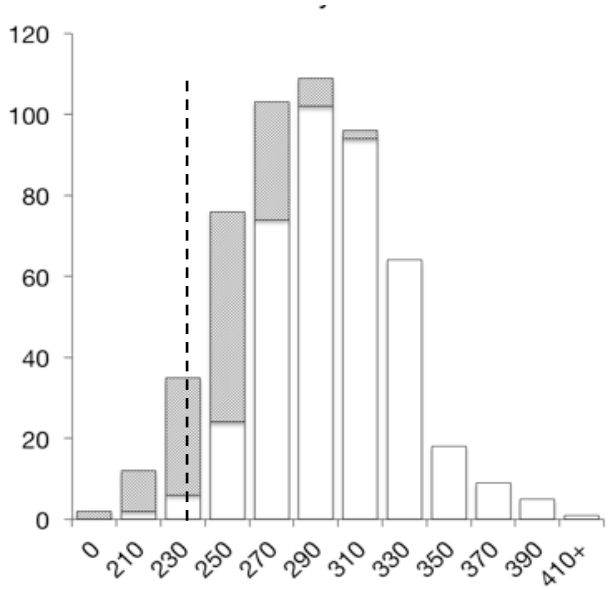


Fig. 19. Size distribution of female pythons captured for trade in Peninsular Malaysia. Grey columns represent immature snakes, while hollow columns represent reproductive snakes. The dashed line represents the proposed minimum size restriction.

Regulation and Prevention of Illegal Trade

To ensure compliance with the minimum size requirement for captures of live pythons, PERHILITAN has set a limit on the minimum size of skins allowed to be exported. This is important, because skin sizes can be measured, unlike quotas and other management tools that rely on counting numbers of skins and trying to link them to specific restrictions on absolute numbers. Measurements of skins are strongly correlated with the size of live snakes, allowing management and enforcement agencies to determine the length of a live snake from measurements made on its dry skin (Fig. 20). Multiple measurements can be compared for improving confidence that skins of interest are indeed from live pythons of a defined size (Fig. 21).

PERHILITAN will implement size limits because they can be regulated at any point within the trade chain, from the hunter to export/import. Once export has occurred, Customs authorities of the importing country can also regulate size limits. Once this system has been properly rolled-out, the Malaysian CITES Management Authorities will likely request the CITES Secretariat to issue a notification, requesting that other Parties assist Malaysia in the enforcement of these skin size limits.

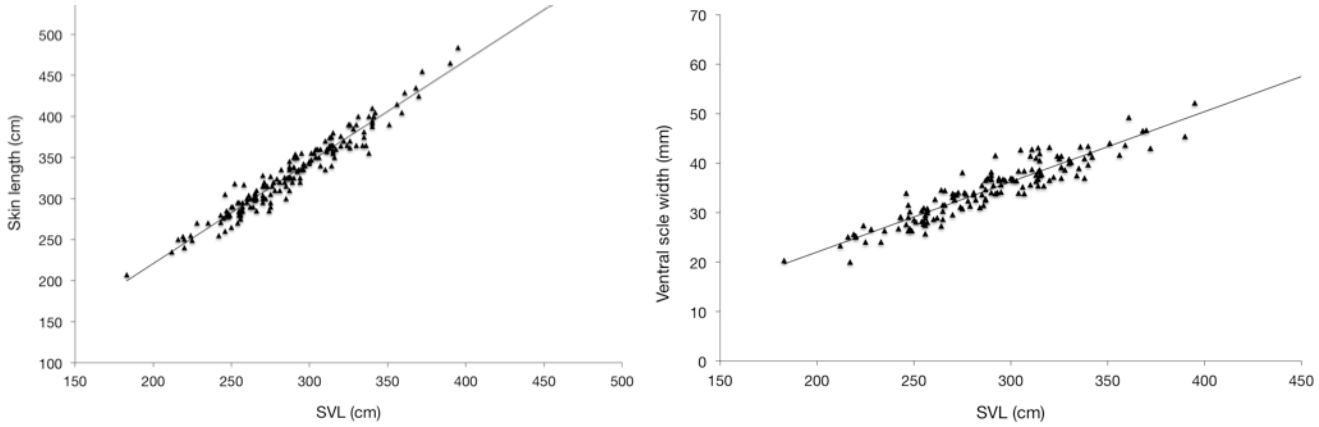


Fig. 20. Relationships between the snout-to-vent length (SVL) of live reticulated pythons and dry skin length (left), and dry skin ventral scale width (right). Measures taken on dried skins can be used to enforce minimum size limits for live pythons.

For further regulation, Malaysia is exploring the implemtation of specific skin-cutting patterns, which will indicate the origin of Malaysian skins. This system is already in use for the trade of yellow anacondas (*Eunectes notaeus*) from Argentina (Waller et al. 2011). PERHILITAN will encourage processing facilities to use a Malaysian-specific cutting pattern so skins of Malaysian pythons can be quickly and easily identified (example in Figure 21).

Fig. 21. Photographs of (a) measurements taken on python skins used to enforce minimum capture sizes, and (b) tail section of left on the skin as a country-specific skinning pattern.

Ongoing Monitoring

To ensure ongoing sustainability of this trade, PERHILITAN will implement two forms of ongoing monitoring. The first is a continuation of Malaysia's current trader record keeping system. Simple record keeping by owners of python processing facilities can provide powerful information on trends in the numbers and demographic attributes of pythons collected at different times and sites. The types of data to be collected include the date of sale, name of the

seller, approximate collection location, size classes of pythons or skins sold, and the number of pythons in each size class. To complement trader record monitoring, a second, independent, monitoring method will be implemented. PERHILITAN will continue the python demographic monitoring program it has established since 2011, the results of which can be found in Chapter 3. Harvest monitoring aims to understand changes over time and does so by examining trends in the medium (3 – 5 years) to long term (>5 years). When a database of knowledge about a harvested population has been consistently and rigorously gathered, ongoing monitoring can reveal changes in that population, which may be a direct result of harvesting pressure (Caughley and Sinclair, 1993).

Adaptive Harvest Management

If the monitoring conducted by PERHILITAN reveals potentially deleterious impacts of harvesting on wild python popualtions, the management system in place can rapidly adapt to minimize those impacts. This is achieved by adapted the sizes of pythons that can be legally captured and exported. Not only can this system ensure important life stages are protected, but it also reduces the absolute numbers of snakes capable of being harvested at one time. Such an adaptive management system is particularly important for snakes, whose populations are inherently difficult to survey in the field with accuracy (Natusch et al. 2015).

Traceability

The way python harvesting and trade in Peninsular Malaysia is structured, there is no tagging or traceability systems than can prevent the introduction of illegally sourced skins into the legal trade. Instead, Malaysia's management systems aims to incentivise traders to operate within the law by eliminating incentives to collect snakes outside the size limit. In addition, Malaysia will continue to implement its present tracebility system, whereby all shipments of skins are packaged in the presence of staff from PERHILITAN. Shipments are then closed using an official seal that, if broken, renders the shipment void.

CHAPTER 6: EVIDENCE FOR NON-DETRIMENTAL TRADE IN WILD SPECIMENS

Introduction

In the preceeding chapters we provided the information that has informed our NDF process, as well as the measures in place (and enhancements being implemented) to ensure ongoing sustainability of this trade. In the present chapter, we summarise some of that information to justify why we believe the current level of harvest and export of reticulated python skins from Peninsular Malaysia (162,000 specimens per year) is non-detrimental to the survival of the species in the wild.

Attributes That Enhance Sustainability

Reticulated pythons remain abundant. - Harvests of reticulated pythons began in the 1950's. Since that time, people in Malaysia have harvested millions of specimens for trade, and continue to do so in similar volumes. Thus, despite the ongoing harvest, reticulated pythons remain abundant in Peninsular Malaysia. This strongly suggests that a level of sustainability has been achieved. Indeed, reticulated pythons remain one of the most common animals in Peninsular Malaysia. During our field surveys (Chapter 2), we captured 45 pythons within a relatively short period, despite intense hunting continuing at those sites. Furthermore, PERHILITAN is called to attend to around 125 cases of human python conflict each year.

Reticulated pythons are only harvested in part of their range. - Pythons cannot be captured in Protected Areas, National Parks, State Parks and Permanent Forest Reserves, (which comprise approximately 45% of Peninsular Malaysia's land area). Furthermore, the entire state of Johor (15% of Peninsular Malaysia's land area) does not allow hunting of snakes anywhere in the state and no licences are issued for the state of Terengganu (10% of Peninsular Malaysia's land area). Finally, much of Peninsular Malaysia is still forested (Fig. 1). Although not all forests are protected, the difficulty in accessing remote and dense forest areas likely dissuades many hunters from capturing snakes at these sites.

Reticulated pythons thrive in modified habitats. - The results of our field studies and other studies (e.g., Shine et al. 1999) suggest that reticulated pythons thrive in oil palm plantations, which cover a significant proportion of Peninsular Malaysia's land area. Furthermore, the species remains common in other agricultural habitats, near villages, and even in Malaysia's largest city (Kuala Lumpur). This result is confirmed by our interviews with python hunters (Chapter 4). Finally, gut contents of pythons collected for trade in Peninsualr Malaysia comprised of commensal rodents and domesticated animals (chickens, cats, dogs), supporting the conclusion that many snakes are captured in semi-urban areas near human habitation (Natusch pers. comm. 2016).

Capture frequency is low. - Because of their cryptic and sedentary nature, reticulated pythons can go undetect for large proportions of time. Their biology is also such that large numbers of individuals cannot be captured at specific sites. Reproducing pythons also remain sedendary within concealed hiding places for three months while brooding clutches of eggs, which minimises captures of this important demographic group (Shine et al. 1998).

Python harvesting is seasonal. - Although reticulated pythons are harvested throughout the year, most individuals are captured during the rainy season (November to March). This is important, because reticulated pythons in Peninsular Malaysia lay eggs in May, when far fewer snakes are active and thus exposing themselves to capture.

A large proportion of pythons reproduce before being harvested. - Our research has shown that approximately 75% of female reticulated pythons have undergone a reproductive event before they are harvested. Many larger individuals have undergone two or more reproductive events. The minimum size of pythons demanded by trade corresponds broadly to the size at sexual maturity, which means many snakes are contributing to population recruitment. The results of our investigations also confirm the findings of earlier works, which show that reticulated pythons in Malaysia produce large clutches of large eggs (high fecundity).

Stakeholders actively engage in sustainable practices. - The hunters interviewed by the department indicated that they take specific actions to enhance sustainability. For example, many hunters rotated their capture locations, while others do not capture small or gravid individuals. Processing facility owners also allow gravid female pythons to incubate their eggs, before releasing the resulting hatchling back into the wild to aid population recruitment.

Monitoring is ongoing. - The two forms of monitoring (independent and trader records) undertaken by the department provide detailed and robust information on trends in wild python populations. Because these monitoring activities are continuous, any changes in the wild population of pythons can be detected and acted upon immediately.

Management of trade is robust and can be adaptive if necessary. - Regulating trade using size limits is simple and effective. If the department's ongoing monitoring does identify potentially deleterious changes to wild populations, limits on the sizes of skins permitted for exports can be rapidly adapted to be more precautionary.

No evidence of Illegal trade. - PERHILITAN has received no information that illegal trade of Malaysian reticulated python skins is taking place within the country. Furthermore, annual harvests of pythons in Peninsular Malaysia are consistently below the national quota. It is thus highly improbable that traders would engage in difficult and often-expensive illegal trade activities when a legal conduit remains open. Finally, suspicion about illegal trade activities has focused on other python skin producing range states (Kasterine et al. 2012).

CONCLUSION

Despite more than 50 years of harvesting, reticulated pythons remain abundant in Peninsular Malaysia. This fact, combined with the results of our lengthy and multifaceted NDF research program, strongly suggests that a degree of sustainability in the python skin trade has been achieved. The sustainability of this resource is undoubtedly facilitated by: (1) the unique biological and ecological attributes of this species, (2) its ability to thrive in human modified environments, and (3) the specific attributes of the harvest itself (Kasterine et al. 2012).

But even if sustainability of the python resource was compromised, it is implausible that harvesting could ever result in the extinction of pythons in Peninsular Malaysia. For example, protected areas comprise 45% of Peninsular Malaysia's land area, and are inhabited by several endangered species far more susceptible to human disturbance than pythons (e.g., Tigers *Panthera tigris* and Asian Elephants *Elephas maximus*). Furthermore, there are many parts of Peninsular Malaysia (e.g., Johor and Terengganu states) where no harvesting occurs. Thus, maintenance of healthy python populations in Malaysia relates primarily to ensuring commercial sustainability of the resource, rather than preventing biological extinction of the species.

The Malaysian CITES Scientific Authority believes the harvest quota of 162,000 specimens per year presently reflects a non-detrimental level of offtake. Rather than revise the quota, Malaysia has put in place additional levels of regulation to control harvests (size limits) and ensure non-detriment. The Malaysian CITES Management and Scientific Authorities concede that, in the past, the basis by which the annual quota for this species was establsished was not sufficient to deliver the necessary confidence to other CITES Parties about the sustainability of exports. However, the steps taken by Malaysia to address these concerns have been substantial. A robust (and most importantly, continuously operating) NDF system is in place, and management, monitoring and regulatory systems have been amended to better reflect the biology of this species and dynamic nature of its trade.

Specifically, in compliance with Article IV and the recommendations of the Animals Committee:

- Malaysia's CITES Scientific Authority is satisfied that current exports are not detrimental to the survival of reticulated pythons in the wild in Peninsular Malaysia,
- Malaysia's CITES Scientific Authority is satisfied that current and future levels of export are appropriately monitored and that the reticulated python is being maintained throughout its range at a level consistent with its role in the ecosystems in which it occurs and well above the level at which it might become eligible for inclusion in Appendix I, and
- Malaysia's CITES Scientific Authority has advised the Management Authority on suitable measures to limit the grant of exports should trade be deemed detrimental in future.

LITERATURE CITED

Abel, F. (1998). Status, population biology and conservation of the water monitor (*Varanus salvator*), the reticulated python (*Python reticulatus*), and the blood python (*Python curtus*) in Sumatra and Kalimantan, Indonesia – Project Report North Sumatra. Mertensiella 9:111-117.

Ashley, D. (2013). Traceability systems for a sustainable international trade in South-East Asian python skins. Report co-commissioned by UNCTAD and CITES Secretariats. Available from http://unctad.org/en/PublicationsLibrary/ditcted2013d6_en.pdf.

Auliya M. (2006). Taxonomy, Life History and Conservation of Giant Reptiles in West Kalimantan (Indonesian Borneo). Verlag, Münster, 432 pp.

Caughley, G. and Sinclair, A. (1994). *Wildlife Ecology and Management*. Blackwell Science: Victoria.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (2015). CITES trade database. Available from http://trade.cites.org/. Accessed August 2015.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (2015). CITES 'Non-detriment findings' - Current policies on NDFs. Available from https://cites.org/eng/prog/ndf/current_policies Accessed August 2015.

Copes, P. 1986. A Critical Review of the Individual Quota as a Device in Fisheries Management. Land Economics 62:278–291.

Groombridge, B. and Luxmoore, R. (1991). Pythons in South East Asia – A review of distribution, status and trade in three selected species. A report to CITES Secretariat, Lausanne, Switzerland, 127 pp.

Horowitz, L.S. (1998). Integrating indigenous resource management with wildlife conservation: A case study of Batang Ai National Park, Sarawak, Malaysia. *Human Ecology* 26:371-403.

Jenkins M. and Broad S. (1994). International trade in reptile skins: a review and analysis of the main consumer markets 1983-1991. TRAFFIC International, Cambridge, UK. 68pp.

Khadiejah, S. (2013). Commercial exploitation of reticulated python (*Python reticulatus*) in Peninsular Malaysia. Unpublished MSc thesis. Durrell Institute of Conservation and Ecology. 30pp

Kasterine, A., Arbeid, R., Caillabet, O. and Natusch, D. (2012). *The Trade in South-East Asian Python Skins*. International Trade Centre (ITC), Geneva.

Luiselli, L. (2006). Site occupancy and density of sympatric Gaboon viper (Bitis gabonica) and nose-horned viper (Bitis nasicornis). Journal of Tropical Biology 22:555-564.

Murphy, J. C., amd Henderson, R. W. (1987). Tales of Giant Snakes: A Historical Natural History of Anacondas and Pythons. Malabar, FL: Krieger.

Natusch, DJD., Waller, T., Micucci, P., and Lichtschein, V. (2015). Developing CITES Non-detriment Findings for snakes. https://cites.org/sites/default/files/eng/com/ac/28/E-AC28-14-01_Annex2.pdf

Shine, R., Harlow, P., Ambariyanto., Boeadi, Mumpuni, and Keogh, J.S. (1998). Monitoring monitors: a biological perspective on the commercial harvesting of Indonesian reptiles. *Mertensiella* 9:61-68.

Shine R., Ambaryianto, Harlow P. S. and Mumpuni (1999). Reticulated Pythons in Sumatra: biology, harvesting and sustainability. – Biol. Cons. 87: 349-357.

Sutherland, W. J. (2001). Sustainable exploitation: a review of principles and methods. Wildlife Biology 7:131–140.

Waller, T., Micucci, P., Menghi, O., Barros, M., and Draque, J. (2011). The relevance of CBNRM for the conservation of the Yellow Anaconda (*Eunectes notaeus*, CITES Appendix II) in Argentina. Pp. 93-102, In: M. Abensperg-Traun, D. Roe & C. O'Criodain (eds.), CITES and CBNRM. Proceedings of an international symposium on "The relevance of CBNRM to the conservation and sustainable use of CITES-listed species in exporting countries", Vienna, Austria, 18-20 May 2011. Occasional Paper of the IUCN Species Survival Commission No. 46. Gland, Switzerland. 172pp.