



United States Department of the Interior

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In Reply Refer To:
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Memorandum

To: The File

From: Chief, Branch of Permits  OCT 19 2016

Subject: Enhancement Finding for Wild and Wild-managed Lions Taken as Sport-hunted Trophies in South Africa

After evaluating the available information from the Government of South Africa, other information available to the Service, and comments received from interested parties, the U.S. Fish & Wildlife Service (Service) has determined that permits for the importation of sport-hunted trophies of wild and wild-managed lions (*P. l. melanochaita*) from South Africa taken during the 2016 calendar year meet the enhancement criteria under 50 CFR 17.32. Therefore, applications received for import of such specimens will be considered to have met this requirement. In accordance with the 4(d) rule for *P. l. melanochaita*, 50 CFR 17.40(r), the Service will review each application for import of such specimens on a case-by-case basis and each application will also need to meet all other applicable permitting requirements before it may be authorized.

Governance of the Lion in the United States:

On October 29, 2014, the Service published in the Federal Register a finding that listing the African lion subspecies (*Panthera leo leo*) as a threatened species under the Endangered Species Act (Act) was warranted and proposed a rule under section 4(d) of the Act to provide conservation measures for the African lion. 79 Fed. Reg. 64472. On December 23, 2015, after fully considering the comments from the public and the peer reviewers on the proposed rule, the Service published in the Federal Register the final rule in which the taxonomic classification of the Asiatic lion (previously classified as *P. l. persica* and listed as an endangered species under the Act) was changed to *P. l. leo* (Asia and western, central and northern Africa) and listed as an endangered species, and the *P. l. melanochaita* (southern and eastern Africa) subspecies was listed as a threatened species with a rule under section 4(d) of the Act, which is set forth at 50 CFR 17.40(r) (USFWS 2015; 80 Fed. Reg. 79999). The effective date of this listing is January 22, 2016. Therefore, as of January 22, 2016, the lion subspecies *Panthera leo melanochaita*, whose range includes South Africa, is listed as threatened under the ESA and is regulated under an ESA section 4(d) special rule [50 CFR 17.40(r)].

Section 9 of the Act and our implementing regulations at 50 CFR 17.21 and 50 CFR 17.31 set forth a series of general prohibitions that apply to all endangered and threatened wildlife, respectively, except where a 4(d) rule applies to threatened wildlife, in which case the 4(d) rule contains all the applicable prohibitions and exceptions. Under the 4(d) rule for *P. l. melanochaita*, all of the prohibitions under 50 CFR 17.31 apply to *P. l. melanochaita* specimens. These prohibitions, at 50 CFR 17.21 and 17.31, in part, make it illegal for any person subject to the jurisdiction of the United States to “take” (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or to attempt any of these) within the United States or upon the high seas; import or export; deliver, receive, carry, transport, or ship in interstate or foreign commerce, by any means whatsoever, in the course of commercial activity; or sell or offer for sale in interstate or foreign commerce any lion specimens. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken in violation of the Act. Permits may be issued to carry out otherwise prohibited activities involving endangered and threatened wildlife species under certain circumstances. Regulations governing permits for endangered species, such as *P. l. leo*, are codified at 50 CFR 17.22. Regulations governing permits for threatened species, such as *P. l. melanochaita*, are codified at 50 CFR 17.32.

In sum, under paragraph 17.40(r)(1), all the prohibitions and exceptions under 50 CFR 17.31 and 50 CFR 17.32 apply to *P. l. melanochaita*. Accordingly, the Service may authorize the import of a sport-hunted lion trophy from South Africa, but only if it first makes a finding that permitting import of a trophy would enhance the survival of the species in the wild.

As we explained when finalizing the 4(d) rule for *P. l. melanochaita*, any person wishing to conduct an otherwise prohibited activity, including all imports of *P. l. melanochaita* specimens, must first obtain a permit under 50 CFR 17.32. As with all permit applications submitted under 50 CFR 17.32, the individual requesting authorization to import a sport-hunted trophy of *P. l. melanochaita* bears the burden of providing information in their application showing that the activity meets the requirements for issuance criteria under 50 CFR 17.32. In some cases, such as for import of sport-hunted trophies, it is not always possible for the applicant to provide all of the necessary information needed by the Service to make a positive determination under the Act to authorize the activity. In such cases, the Service may consult with the range country and other interested parties to the extent practicable to obtain necessary information. The Service has the discretion to make the required findings on sport-hunted trophy imports of *P. l. melanochaita* on a countrywide basis, although individual import permits will be evaluated and issued or denied for each applicant. While the Service may make enhancement findings for sport-hunted trophy imports of *P. l. melanochaita* on a country-wide basis, the Service encourages the submission of information from individual applicants. We rely on the information available to the Service and may rely on information from sources other than the applicant when making a permitting decision.

In evaluating the available data on lion hunting in South Africa, the Service is treating wild and wild-managed lions separately from captive-bred lions raised for hunting purposes since the management and oversight of these specimens is different within South Africa and, therefore, information relevant to the Service’s consideration of whether permitting import of sport-hunted trophies of lions may enhance the survival of the species in the wild is different between wild and wild-managed lions and captive-bred lions in South Africa. A separate determination will be made for captive-bred lions.

General considerations:

As we also explained when finalizing the 4(d) rule, our threatened species permitting regulations at 50 CFR 17.32 provide issuance criteria for threatened species permits (50 CFR 17.32(a)(2)), but do not specify what would constitute the enhancement of propagation or survival with regard to authorizing the import of parts or products of *P. l. melanochaita*, including sport-hunted trophies. Therefore, when making a determination of whether an otherwise prohibited activity enhances the propagation or survival of *P. l. melanochaita*, the Service examines the overall conservation and management of the subspecies in the country where the specimen originated and whether that management of the subspecies addresses the threats to the subspecies (*i.e.*, that it is based on sound scientific principles and that the management program is actively addressing the current and longer term threats to the subspecies). In that review, we evaluate whether the import contributes to the overall conservation of the species by considering whether the biological, social, and economic aspects of a program from which the specimen was obtained provide a net benefit to the subspecies and its ecosystem.

The Service will evaluate any application received that involves *P. l. melanochaita* in the context of enhancement of propagation or survival permitting in accordance with our threatened species permitting regulations at 50 CFR 17.32 and issuance criteria for threatened species permits (50 CFR 17.32(a)(2)). These include, in addition to the general permitting criteria in 50 CFR 13.21(b):

- (i) Whether the purpose for which the permit is required is adequate to justify removing from the wild or otherwise changing the status of the wildlife sought to be covered by the permit;
- (ii) The probable direct and indirect effect that issuing the permit would have on the wild populations of the wildlife sought to be covered by the permit;
- (iii) Whether the permit, if issued, would in any way, directly or indirectly, conflict with any known program intended to enhance the survival probabilities of the population from which the wildlife sought to be covered by the permit was or would be removed;
- (iv) Whether the purpose for which the permit is required would be likely to reduce the threat of extinction facing the species of wildlife sought to be covered by the permit;
- (v) The opinions or views of scientists or other persons or organizations having expertise concerning the wildlife or other matters germane to the application; and
- (vi) Whether the expertise, facilities, or other resources available to the applicant appear adequate to successfully accomplish the objectives stated in the application.

In addition to these factors, particularly in relation to sport hunting, we find the *IUCN Species Survival Commission (SSC) Guiding Principles on Trophy Hunting as a Tool for Creating Conservation Incentives, Ver. 1.0* (IUCN SSC 2012), to provide useful principles, which, considered in conjunction with our threatened species issuance criteria, will aid the Service when making an enhancement finding for importation of sport-hunted trophies of *P. l. melanochaita*. This document sets out guidance from experts in the field on the use of trophy hunting as a tool for “creating incentives for the conservation of species and their habitats and for the equitable sharing of the benefits of use of natural resources” (IUCN SSC 2012, p. 2) and recognizes that recreational

hunting, particularly trophy hunting, can contribute to biodiversity conservation and more specifically, the conservation of the hunted species.

The SSC document lays out five guiding principles that, considered in conjunction with our threatened species issuance criteria, will aid the Service when making an enhancement finding for importation of sport-hunted trophies of *P. l. melanochaita*:

(a) *Biological sustainability*: The hunting program cannot contribute to the long-term decline of the hunted species. It should not alter natural selection and ecological function of the hunted species or any other species that share the habitat. The program should not inadvertently facilitate poaching or illegal trade in wildlife by acting as a cover for such illegal activities. The hunting program should also not manipulate the ecosystem or its component elements in a way that alters the native biodiversity.

(b) *Net Conservation Benefit*: The biologically sustainable hunting program should be based on laws, regulations, and scientifically based quotas, established with local input, that are transparent and periodically reviewed. The program should produce income, employment, and other benefits to create incentives for reducing the pressure on the target species. The program should create benefits for local residents to co-exist with the target species and other species. It is also imperative that the program is part of a legally recognized governance system that supports conservation.

(c) *Socio-Economic-Cultural Benefit*: A well-managed hunting program can serve as a conservation tool when it respects the local cultural values and practices. It should be accepted by most members of the community, involving and benefiting local residents in an equitable manner. The program should also adopt business practices that promote long-term economic sustainability.

(d) *Adaptive Management: Planning, Monitoring, and Reporting*: Hunting can enhance the species when it is based on appropriate resource assessments and monitoring (e.g., population counts, trend data), upon which specific science-based quotas and hunting programs can be established. Resource assessments should be objective, well documented, and use the best science available. Adaptive management of quotas and programs based on the results of resource assessments and monitoring is essential. The program should monitor hunting activities to ensure that quotas and sex/age restrictions of harvested animals are met. The program should also generate reliable documentation of its biological sustainability and conservation benefits.

(e) *Accountable and Effective Governance*: A biologically sustainable trophy-hunting program should be subject to a governance structure that clearly allocates management responsibilities. The program should account for revenues in a transparent manner and distribute net revenues to conservation and community beneficiaries according to properly agreed decisions. All necessary steps to eliminate corruption should be taken and to ensure compliance with all relevant national and international requirements and regulations by relevant bodies such as administrators, regulators and hunters.

The Service's approach to enhancement findings for the importation of sport-hunted trophies of *P. l. melanochaita* is consistent with the purpose and intent of the Endangered Species Act. Before we will authorize the importation of a sport-hunted trophy, we must determine that the trophy-hunting program is managed to ensure the long-term survival of the species. In many parts of the world, wildlife exists outside of protected areas and must share the same habitat and compete with humans living in these areas for space and resources. If communities that share these resources with wildlife do not perceive any benefits from the presence of wildlife, they may be less willing to tolerate the wildlife. However, under certain circumstances, trophy hunting can address this problem by making wildlife more valuable to the local communities and encourage community support for managing and conserving the hunted species, as well as other species.

When evaluating whether the importation of a trophy of *P. l. melanochaita* would be authorized pursuant to 50 CFR 17.32, in accordance with our threatened species issuance criteria, we will examine how a country's management program for lions addresses the three main threats that have led to the decline of the subspecies: habitat loss, loss of prey base, and human-lion conflict. When examining a management program and whether trophies taken as part of that program meet the issuance criteria, we study a number of factors. Some of the factors we consider include whether the program is based on sound scientific information and identifies mechanisms that would arrest the loss of habitat or increase available habitat (*i.e.*, by establishing protected areas and ensuring adequate protection from human encroachment). We consider whether the management program actively address the loss of the lion's prey base by addressing poaching or unsustainable offtake within the country. A component of a management plan from which trophy imports would meet the issuance criteria would be whether there are government incentives in place that encourage habitat protection by private landowners and communities and incentives to local communities to reduce the incursion of livestock into protected areas or to actively manage livestock to reduce conflicts with lions. We examine if the hunting component of the management program supports all of these efforts by looking at whether hunting concessions/tracts are managed to ensure the long-term survival of the lion, its prey base, and habitat. Hunting, if properly conducted and well managed, can generate significant economic benefits that may contribute to the conservation of lions. In looking at whether we are able to authorize the import of a trophy under the issuance criteria of 50 CFR 17.32, we will examine if the trophy hunting provides financial assistance to the wildlife department to carry out elements of the management program and if there is a compensation scheme or other incentives to benefit local communities that may be impacted by lion predation. We will also consider how a U.S. hunter's participation in the hunting program contributes to the overall management of lions within a country.

Management programs for *P. l. melanochaita* are expected to address, but are not limited to, evaluating population levels and trends; the biological needs of the species; quotas; management practices; legal protection; local community involvement; and use of hunting fees for conservation. In evaluating these factors, we will work closely with the range countries and interested parties to obtain the information. By allowing entry into the United States of *P. l. melanochaita* trophies from range countries that have science-based management programs, we anticipate that other range countries would be encouraged to adopt and financially support the sustainable management of lions that benefits both the species and local communities. In addition to addressing the biological needs of the subspecies, a scientifically based management program would provide economic incentives for local communities to protect and expand *P. l. melanochaita* habitat.

Basis for Finding for Wild and Wild-managed South Africa:

On January 12, 2016, the Service sent a letter to South Africa's Department of Environmental Affairs (DEA) with a list of questions that would aid the Service in evaluating the overall conservation and management of the subspecies, *P. l. melanochaita*, in South Africa and whether that management addresses the three main threats that have been identified as to the decline of the species: habitat loss, loss of prey base, and human-lion conflict. Additionally, in the letter the Service referenced the IUCN Species Survival Commission (SSC) Guiding Principles on Trophy Hunting as a Tool for Creating Conservation Incentives, Ver. 1.0 (IUCN SSC 2012), as it provides useful principles, which when considered in conjunction with the Service's permit issuance criteria, would aid when making the required enhancement finding for permitting importation of sport-hunted lion trophies.

In response to our January 12, 2016, letter, the South African Department of Environmental Affairs provided four documents. These four documents, along with the Service's own final rule on the lion listing under the Act, relevant information obtained separately through open sources such as IUCN documents, and relevant information contained in comments received from interested parties, were the basis of this finding.

South Africa has defined three populations of lions that exist within the country through their Biodiversity Management Plan for the Lion (*Panthera leo*) in South Africa for 2015 to 2019 (BMP; December 2015): *Wild lions*, who completely fulfill their role in biodiversity processes and are largely unmanaged, and exist only in formally proclaimed national parks and game reserves. This population's vital rates and demographics are not actively manipulated. *Wild-managed lions*, which include all lions that have been re-introduced into smaller fenced reserves (<1000km²), and are managed to limit population growth and maintain genetic diversity. Some of the vital rates and demographics of these lions are actively manipulated. *Captive lions*, bred for financial gain, where all vital rates and demographics of these populations are actively manipulated.

Governance of Lions in South Africa: The lion is listed as vulnerable in the South African list of Threatened and Protected Species (ToPS) under Section 56(1) of the National Environmental Management Biodiversity Act, 2004 (South Africa 2004; NEMBA; BMP pg. 1). NEMBA further regulates a permit system regarding restricted activities involving specimens of listed threatened or protected species (NEMBA; Chapter 7). Regulated activities in need of registration include, among others, captive breeding facilities, sanctuaries, scientific institutions, game farms, wildlife traders, wildlife product traders, taxidermists, wildlife translocators, and freight agents (NEMBA, pg. 25).

NEMBA gives effect to the Convention on Biological Diversity (CBD) [South Africa is a party to CBD] and Section 24 in the Bill of Rights of the Constitution of the Republic of South Africa (1996). Under Section 24(b): "everyone has the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that: (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development" (BMP pg. 15).

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES): In addition to South Africa's domestic laws, it is also a Party to CITES. The lion is listed in Appendix II of the Convention. As an Appendix-II species, certain criteria must be met before such

species can be exported, including a finding from the exporting country's CITES Scientific Authority that the proposed activity will not be detrimental to the survival of the species in the wild. In their reply to our inquiry, South Africa provided a copy of their CITES non-detriment finding for lions. Their finding, while focusing only on wild and wild-managed lions, applied to all lion exports from South Africa, including the captive lion population. In personal communication with the SA Management Authority, the Service was informed that the finding might be amended to better clarify that the finding applies to all lions within South Africa.

South Africa is also a member of the Southern African Development Community (SADC). Under the SADC Treaty, Article 5(g) establishes objectives to, among other aspects, promote the sustainable use of wildlife, harmonization of legal instruments governing wildlife use and conservation, promote the conservation of shared wildlife resources through the establishment of transfrontier conservation areas, and facilitate community-based natural resources management practices. To implement the SADC Treaty, member states are required to establish management programs for the conservation and sustainable use of wildlife.

In 1991, South Africa legalized private ownership of wildlife, leading to a significant rise on game ranches and farms. In 2010, private lands with wildlife covered approximately 16.8% of South Africa, compared to national and provincial protected areas accounting for only 6% (Cousins *et al.* 2010). It has been stated that this expansion of private lands and the wildlife industry resulting from the private ownership of wildlife is responsible for significantly increasing South Africa's large mammal populations (Crowley and Mokhema 2014). According to Crowley and Mokhema (2014), South Africa's game ranching industry is worth \$1.1 billion a year and is growing at 10 annually. Under the ToPS regulation, permits can be obtained to carry out activities that may negatively impact the survival of a listed species, such as possession or hunting, provided the applicant meets specific criteria, such as having a biodiversity management plan for the species protected by ToPS. This permitting regime generates funds for national conservation efforts, while allowing landowners to profit from maintaining wildlife on their property. The landowners can then reinvest in the property by funding conservation efforts, managing wildlife, and carrying out anti-poaching efforts (Cousins *et al.* 2010).

Current Lion Status in South Africa: The lion was almost extirpated in South Africa by the early 1900s, remaining only in small numbers in what is now Kruger National Park (NP) and the Kgalagadi Transfrontier Park (TP). With the formation of Kruger NP in the 1920s, wild lion numbers slowly recovered, growing to the current population of approximately 1,700 lions (BMP, pg. 40). Kgalagadi TP has a stable, albeit smaller, population of approximately 400 lions, but is considered a lion stronghold in southern Africa. Lions recolonized Hluhluwe-iMfolozi Park (HiP) in the 1950/1960s and that population is currently stable at approximately 120 lions. Along with small groups of lions in Addo Elephant National Park, Karoo National Park, Marakele National Park, there are approximately 2,200 wild lions in South Africa. In addition, there are approximately 800 wild-managed lions separated among 45 fenced reserves of less than 1,000 square kilometers each (BMP pg. 40).

When the Service listed the lion in southern and eastern Africa as threatened under the ESA, three primary threats to the species throughout its range were identified: loss of habitat, loss of prey base and human-lion conflict. These three threats led to the shrinking of lion populations and range from pre-Colonial South Africa, to the current situation of lions being found predominantly on a limited number of national parks and fenced reserves. However, given the current focus of wildlife

management practices of South Africa on fencing protected areas, additional habitat loss has been minimized. Further, due to more intensive management of the fenced reserves to maintain biodiversity, more stable prey bases and limited human-lion conflict are observed.

According to South Africa's Scientific Authority's non-determent finding (NDF) published in September 2015, there are no specific official figures on the illegal trade in lions and lion products in South Africa besides what are reported in the media or by annual reports on seizures and prosecutions. Most of the reports refer to illegal translocations of animals or trade in lions and their body parts for which offenders were not in possession of a permit to breed, keep, hunt, catch, sell, convey, or export a live animal or parts thereof. According to the NDF, and supported by information in the Service's final listing rule, the illegal local and international trade in lions poses a moderate, but non-detrimental risk to the species in South Africa (BMP pg. 14).

To manage any population to ensure an appropriate population level and determine whether sport hunting is having a positive effect, it is vital to have sufficient data on population numbers and population trends to base management decisions. According to Riggio et al. 2013 (pg.32), and Bjorklund in Riggio et al 2013 (p.32), the minimum number estimated to constitute a viable population is 500 individuals. Kruger National Park, with approximately 1,200 lions, has a stable population of wild lion and is considered a stronghold for lions in South Africa. Kgalagadi Transfrontier Park, with a stable population of approximately 400 lions, is considered a potential stronghold and conserves the genetic diversity within the Kalahari ecosystem (Bauer et al. 2008; Bjorkland 2003 (pg. 515, 518)). Wild lions in HiP, Addo Elephant National Park, Karoo National Park, and Marakele National Park, albeit smaller in size, appear to be stable, but would need to grow to be considered potential strongholds or maintain genetic diversity. All of these populations receive very little direct management and hunting is not allowed within the National Parks (BMP).

Lion Management in South Africa: In 2015, in response to the requirements under NEMBA and the SADC Treaty, and after stakeholder workshops in 2013 and 2014, South Africa published the **Biodiversity Management Plan for the Lion (*Panthera leo*) in South Africa for 2015 to 2019 (BMP)** and stated that the "BMP for African lion will be regarded as the national strategy for African lions in South Africa" (pg. 2). The BMP was created in response to the Regional Strategy for Lions in East and Southern Africa in 2005 (IUCN SSC Cat Specialist Group 2006), which encouraged the development of national strategies aligned with national strategies of neighboring countries. The BMP was developed jointly by South Africa's Department of Environmental Affairs, Council for Scientific and Industrial Research (CSIR), and Dr. Paul Funston (*Panthera*). The current BMP is the first in a series of five-year iterations, as required under NEMBA, where the success of the preceding five years will be measured, and adaptations made to ensure that the plan for the following five-year period is appropriate for the circumstances at the time.

The BMP has identified the vision that "...lions will provide key opportunities for biodiversity conservation, economic development, social benefits, and improved management capacity." The BMP lays out five specific objectives for the conservation of wild and wild-managed lions within South Africa:

- Improve the conservation status of lions within the broader conservation context
- Develop and implement effective communication tools that are informed by scientific research (communication, education, and public awareness).

- Ensure that existing legal instruments are compatible and complementary at national and provincial levels, and improve the capacity to implement these laws.
- Establish a lion forum or working group.
- Collaborate the alignment of this BMP with lion conservation plans in neighboring countries and link with international working groups

All five of these objectives are stepped down to specific action items with intended 5-year outcomes, indicators on how the action plan is succeeding, and the party responsible for implementation. The BMP will be re-evaluated in 2019 to assess the success of the plan and to modify the BMP for 2020-2025 accordingly.

While these five objectives appear to serve a valuable role in lion management in South Africa, two are most relevant to determining if the implementation of the BMP enhances the propagation or survival of the species, as required by the ESA for the issuance of import permits. The first objective, “Improve the conservation status of lions,” has been broken down into three sub-objectives for wild and wild-managed lions: maintain current protection status of lions; reassess the conservation status of lions; and enhance the conservation status of wild lions. The intended 5-year outcomes of these sub-objectives are to have stable wild lion populations in all protected areas with no illegal trade in wild lions, have more than 80% of all reserves with wild-managed lions integrated into a managed meta-population approach for genetic management, publish norms and standards for the management of wild-managed lions, and a stronger understanding of wild-managed lion population size and trends. To achieve these sub-objects, South Africa has already begun population surveys of wild lions in 2015 and will census every 3 years. They have also started implementing the managed meta-population plan with the goal of over 80% of reserves included by 2019. The norms and standards for the management of wild-managed lions is to be completed by the end of 2016 and the first audits to obtain a stronger understanding of wild-managed lion population trends was completed in 2015 and will be continue annually thereafter.

The second objective, “Ensure that existing legal instruments are compatible and complementary at national and provincial levels, and improve the capacity to implement these laws,” identifies two actions: ensure alignment on permitting decisions at the national and provincial legislation; and address and implement training needs for all aspects of legislations regarding lions. The intended 5-year outcomes of these two actions is the have well-trained managers that make better management decisions and effective legislation to support lion conservation and sustainable utilization of lions.

The BMP has two additional objectives focusing specifically on wild-managed lions. As with the objectives discussed above, these objectives are stepped down to specific action items with intended 5-year outcomes, indicators on how the action plan is succeeding, and the party responsible for implementation. The first is to maintain the wild-managed lion as a key population that contributes to socio-economic-ecological opportunities through mimicking “natural” ecological functions (e.g., wild lion survival rates, fecundity, litter sizes, and mortality rates). This objective is broken down to a number of action items ranging from mimicking survival changes through legal and non-lethal removals, mimicking required immigration/emigration into an area, and measuring demographic responses by determining age- and sex-structure through ranger observations to informing stakeholders on progress of management efforts. These action items predominately have target dates that are on going, annual, or bi-annual, with outcomes that can be used in adaptive management efforts.

The second wild-managed lion objective is “To maintain lion genetic integrity by inducing social limitations through management-assisted dispersal and changes in dominance hierarchies,” focuses primarily on ensuring that lions within smaller fenced areas (<1,000 sq. km.) mimic natural biological processes such as natural dominance hierarchies and female dispersal to ensure genetic diversity. The action items for this objective include modeling genetic diversity within reserves, mimicking male dispersal from and into a social unit through removal (e.g., culling/hunting or translocation) and introduction (translocation) of males at appropriate ages, and at mimicking occasional female dispersal into social units through removal and introductions.

The BMP has information on the lion’s biology, habitat requirements, threats, and relevant legislation, as well as an extensive chapter on wild-managed lions. This chapter explores the history of wild-managed lions, particularly how lions had been managed in the past and what actions are needed to move forward in establishing a meta-population through connecting the reserves and allowing for genetically viable populations that can contribute to the overall wild lion population. According to the BMP, the wild lion populations are complemented by a fragmented population of wild-managed lions in South Africa found on fenced areas or reserves typically less than 1,000 square kilometers in size. This largely results from private property as well as wildlife ownership rights enforced by fencing as required by South African law. According to the BMP, even though opinions vary on the pros (Packer et al. 2013) and cons (Creel et al. 2013) of fencing as an essential component of range-wide lion conservation in the future, the use of fences is likely to increase as human land use continues to expand into lion ranges. The expanded use of fencing, particularly in areas where fencing is currently not widely utilized, could lead to continued fragmentation of lion habitats (Riggio et al. 2013, Dolrenry et al. 2014). Therefore, how wild-managed lions of South Africa provides a key example in how to achieve integrated lion conservation goals in a changing African context that would enhance the survival of the species.

In the 1990s, the number of public and private game reserves started to increase in South Africa and many of them reintroduced lions, mostly as a tourist draw. Lions from these populations were then used for yet more reintroductions leading to a current number of about 800 lions on over 45 fenced reserves (Miller et al 2013). Many of these reserves only have one or two prides of lions, with the largest (Pilanesberg National Park and Madikwe Game Reserve) having four or five prides. Historically, most managers of the reserves had the tendency to manage their lion populations in isolation, although there was some movement of ‘excess’ lions.

Because of fragmented, isolated management of these populations, the conservation value of these lions has been questioned in the past (Hunter et al 2007, Slotow & Hunter 2009). Because of this, the BMP sets out management criteria within the reserves that maintains ecological processes and creates a meta-population (BMP pg. 41 and 42). Researchers noted indicators of inbreeding in two reserves (Trinkel et al. 2008, 2010), while several reserves experienced increased lion population growth rates with subsequent high lion densities (Miller & Funston 2014). The combination of high lion densities and restricted size of the reserves disrupts predator-prey relationships – often with prey dramatically declining (Tambling & du Toit 2005, Slotow & Hunter 2009). In addition, managers increasingly find it hard to locate new areas for ‘excess’ lions (Kettles & Slotow 2009). The Lion Management Forum (LiMF), founded in 2010, provides a platform for concerned managers to discuss the unique issues surrounding small, fenced lion populations. LiMF members recognize that many of the natural processes characteristic of large naturally functioning lion populations have been disrupted on these small reserves. Given the small sizes of these reserves, limited opportunities exist for restoration of these natural processes exist. Therefore, LiMF, and the

BMP, has put forward management interventions that would mimic the outcomes of natural processes that are showing great success (Miller et al. 2013; Ferreira & Hofmeyr 2014).

The BMP recognizes that the managed lion meta-population is slightly contradictory to the theory of meta-population dynamics, as meta-populations are those with spatio-temporally variable subpopulation dynamics, variable dispersal, and availability of empty habitats that are largely connected (Oliveier et al. 2009). That is not the case with most wild-managed lion populations on small reserves in South Africa. Thus, in essence, the managed meta-population is a unique product of the South Africa response to manage and conserve large carnivores on isolated small reserves. The approach essentially recognizes a single population with social groups spatially isolated over vast areas. Some of these challenges can be reconciled through identifying regional nodes.

The lions for the reintroductions into South Africa's small reserves were initially sourced for Etosha National Park, as well as Sabi Sand Game Reserve, adjacent to the Kruger National Park. Recently, SANParks relocated some animal from the South African park of Kgalagadi Transfrontier Park (Slotow & Hunter 2009). Managers applied minimal genetic management throughout the history of lion reintroductions (Slotow & Hunter 2009, Trinkle et al. 2010). As a result, geographic genetic structure in the wild-managed lion meta-population reflect mixed origins with few reserves having lions of only one origin. The South African wild-managed lions thus represent a novel lion genetic diversity not associated with a single origin. Maintaining the origin of the base genetic stock is thus, according to the BMP, a low priority (BMP pg. 45).

Hunting and Utilization: According to the 2015 NDF, hunting of wild lions is not allowed within national parks and only limited hunting is allowed in some provincial reserves, effectively ensuring protection of the majority of wild lions. There is some harvest of wild lions for the control of problem animals (e.g., stock raiding) and, in very limited cases, population management within the national parks. In addition, a small number of wild lions from Kruger NP have dispersed out of the park into some of the reserves surrounding the park and may be harvested. According to the BMP, fewer than 2 wild lions and only approximately 10 wild-managed lions are taken off of private reserves annually.

South Africa has not set a specific annual quota for wild-managed lions. Instead, according to information provided to the Service, authorizations for hunting wild-managed lions are addressed on a case-by-case basis. Reserves maintaining wild-managed lions must submit an application to the provincial authorities requesting a permit. Professional Hunters are obliged to record all completed hunts in a professional hunting register and this register is used to compile provincial reports on the number of lions taken annually. The level of off-take is also evaluated in the management of the meta-population to ensure that only those animals that no longer meet management goals are removed from the population. These animals therefore are typically older lions that have successfully bred and raised several litters of kittens. Most experts consider the recommendation by Packer *et al.* (2011, p. 151) to limit offtake to no more than 1 lion per 2,000 km² to be a sustainable offtake of lions. The BMP (pg. 29) has established more restrictive limits for areas of less than 1000 km² to not exceed 0.5 lions/1000 km².

An active lion bone trade from South Africa to several Asian countries for traditional medicinals is primarily supplied from captive-bred lions taken as hunting trophies, as well as captive-bred lionesses and juvenile lions (BMP pg. 30). Lion bones are being used as a substitute for tiger bones, which is highly valued in Asia, primarily in China and Vietnam (Williams et al. 2015, pg. 1;

Gratwicke et al. 2008, pg. 2–5; Graham-Rowe 2011, pg. s101–s102). In 2008, South Africa began issuing CITES permits for the export of skeletons of captive-bred lions to Asia. The number of lion skeletons for which South Africa issued permits for export to Asia (China, Viet Nam, Thailand and Lao PDR) increased tenfold from 2008 to 2011, from about 50 to about 573 skeletons, respectively, representing a total of 1,160 skeletons or about 10.8 metric tons (11.9 US tons) of lion bone in 4 years (Williams 2015, pp. ix–x, 46). With respect to meeting demand for lion bone, Lindsey et al. (2012, p. 20) state that there are likely to be large numbers of lion bones available for export from game farms, from lionesses and non-trophy males, and as byproducts from animals shot as trophies. In addition, Williams et al. (2015, p. 41) report that there may be between 1,400 and 6,200 lion skeletons from past trophy hunts on South African game farms that could potentially be used to supply demand for lion bone.

The BMP suggests that the value of bones, whether wild or captive-bred, is not high enough to stimulate the illegal harvest of lions solely to sell the bones into the bone trade. However, there is the potential that if the value of bones increases due to increasing demand from Asian markets, that captive-bred lions could be a legal source of bones that masks the illegal harvest of wild lions. According to Williams et al. (2015, p. x), the 2013 price paid to South African game farmers and landowners for lion bones was \$1,260–2,100 USD per skeleton. In many lion range states, this exceeds per capita GDP (gross domestic product) (World Bank 2015, unpaginated). Thus, the current price paid for lion bone may provide incentive in some countries to poach wild lions. While the lion bone trade appears to currently be based primarily in South Africa’s captive-bred lion hunting industry, the trade appears to be having little or no impact on wild lion populations in South Africa at this time—lion populations in South Africa are stable or increasing and there is little poaching of wild lions in the country (BMP 2015, pp. 1, 26; Williams et al. 2015, pp. 79–80).

Evaluation:

As stated earlier, the Service will evaluate any application in accordance with our threatened species permitting regulations at 50 CFR 17.32 and issuance criteria for threatened species permits (50 CFR 17.32(a)(2)). In evaluating each of these criteria on the basis of information available to the Service, we have been able to determine that the import of wild and wild-managed lions would qualify for the issuance of the required import permit.

17.32(a)(2)(i): Whether the purpose for which the permit is required is adequate to justify removing from the wild or otherwise changing the status of the wildlife sought to be covered by the permit:

While there is habitat available to lions on the national parks and within the smaller, fenced reserves, much of South Africa has been converted into agricultural uses, managed plantation forests, human developments, or extractive industries. With the legalization of private ownership of wildlife in the early 1990s, there has been a significant increase in private land set aside for wildlife. This has led to a boost in South Africa’s wildlife, particularly large mammals. South Africa laws, such as ToPS, were put into place to ensure that utilization of this wildlife is sustainable and provides for long-term incentives to maintain these areas for wildlife protection. The national parks and fenced reserves are basically islands of natural areas in a sea of development. It is only through the on-going management of these remaining natural areas that lions survive in South Africa. South Africa’s management of wild and wild-managed lion population as a meta-population, using human intervention (e.g., translocation) as a substitute for

natural occurrences (e.g., dispersal), is ensuring that lion populations are genetically healthy and viable.

While it has been stated that South Africa's hunting industry generates \$1.1 billion annually, not all of this is connected to lion hunting or to U.S. hunters. However, lions are a key component of hunting industry since they are part of the "Big 5" trophies and draw U.S. hunters to South Africa. Based on the information available to the Service, the presence of private reserves has increased the number and diversity of wildlife in South Africa, thus fueling the hunting industry, which funds the on-going success of private reserves. It appears that without the hunting industry, these reserves, which have become islands of wilderness in a sea of civilization in much of South Africa, would not be economically viable, and therefore would not exist. With an annual harvest of approximately 10 wild-managed lions and 2 wild lions annually, U.S. hunter participation in lion hunts, in and of its own, is not enough to make or break the industry and lead to the decline of reserves. However, U.S. hunters do play a significant role in the industry and the removal of their participation could have a long-term impact.

Further, ToPS and the BMP have put into place mechanisms to adequately oversee the harvest of wild and wild-managed lions in South Africa. With an annual harvest of approximately 10 wild-managed lions, South Africa is not exceeding the limits identified in the BMP of 0.5 lions/1,000 sq. km. The objectives of the BMP and the actions and monitoring activities that have been put into place to achieve these objectives should support the adaptive management approach that South Africa has established for managing lions. The Service will, of course, need to continue to monitor the effectiveness of the BMP and modify its determination of whether the issuance of import permits remains appropriate.

Therefore, based on the information available to the Service and provided that the reserve where the lion was taken was properly permitted and in compliance with national and provincial regulations, the purpose for which a permit being requested is adequate to justify removing lions from the wild or otherwise changing their status.

17.32(a)(2)(ii): The probable direct and indirect effect that issuing the permit would have on the wild populations of the wildlife sought to be covered by the permit:

As the national management plan, the BMP for lions is extensive and addresses many aspects of lion conservation and management. As reviewed above, the BMP provides a history of the relevant legislation in regards to lion conservation and puts the current efforts into context. The BMP also reviews the species' biology, population status, habitat requirements, and threats to lion populations. Objectives for conservation of the species as well as a plan to develop a meta-population for wild-managed lions are also included. Lastly, but equally importantly are the monitoring and evaluation of efforts laid out in the BMP. The monitoring plans have scientifically sound methodologies.

Comparing the information provided by the South African government and other sources, it appears that the hunting program in South Africa is addressing the three main threats that were identified by the Service when making the determination that the species was threatened with the possibility of extinction. The fenced reserves and national parks are maintaining habitat for lions and ensuring that there is no further loss, provided that the reserves can remain economically viable. In order to maintain a viable population of wild and wild-managed lions, the parks and reserves must maintain

biodiversity and a sustainable prey base. Finally, while there is still controversy over the extensive utilization of fencing in South Africa, it does reduce human-lion conflicts and the number of lions killed in retaliation for killing livestock. Therefore, the management of lions on these reserves and, as part of this management, the limited hunting of lions contributes to the on-going survival of the species in South Africa.

Provided that the off-take of wild and wild-managed lions continues to be monitored and the actions identified in the BMP continue to be implemented, the participation of U.S. hunters in lion hunts would provide an indirect benefit to wild populations by helping to support the reserves where lions are found. Therefore, based on the information available to the Service, the probable direct and indirect effect that issuing an import permit for a legally hunted lion would have on the species would be positive.

17.32(a)(2)(iii): Whether the permit, if issued, would in any way, directly or indirectly, conflict with any known program intended to enhance the survival probabilities of the population from which the wildlife sought to be covered by the permit was or would be removed:

As stated above, South Africa is closely monitoring and controlling the harvest of wild and wild-managed lions through permitting under ToPS and through the BMP. The issuance of import permits for lions legally hunted under these authorities would not conflict with any programs intended to enhance the survival probably of the species in South Africa. As with all aspects of an adaptive management approach to managing a species, the Service will need to continue to monitor the effectiveness of the hunting program to ensure that it continues to provide the stated benefits to lions.

Therefore, based on the information available to the Service, the issuance of import permits for legally hunted lions would not conflict with any known conservation programs.

17.32(a)(2)(iv): Whether the purpose for which the permit is required would be likely to reduce the threat of extinction facing the species of wildlife sought to be covered by the permit:

As stated, wild lions only occur in a limited number of national parks in South Africa and wild-managed lions are currently found on 45 reserves of less than 1,000 sq. km. While the wild lions on the national parks receive only limited direct management activities, the reserves require management that is more intensive in order to mimic natural biological and ecological roles of lions. All indication show, that given the threats that were identified by the Service when listing the species as threatened under the ESA, the presence of these reserves, as well as the parks, is actively addressing the three causes of lion decline: loss of habitat, loss of prey base, and lion-human conflicts. While the concept of lions behind fences has both benefits and drawbacks, it appears to be a major contributor to the on-going survival of lions in the wild in South Africa. Without a doubt, while having open, unmanaged habitat that is not being impacted by human intervention would be the ideal condition for lions in South Africa and throughout its range, this is not a viable option within South Africa.

With limited, controlled off-take of lions in a manner that would mimic natural processes, the legal hunting activities that U.S. hunters would be involved in would contribute to reducing the threat of extinction of lions. This off-take must be monitored to ensure that it is sustainable and that, to the extent possible, normal lion behavior and ecology is not negatively impacted. It appears that the

permitting activities under ToPS and the implementation of the BMP will ensure the long-term survival of lions. The utilization of hunters to manage the populations on the reserves is an important element of the success of lion management in South Africa.

Therefore, based on the information available to the Service, the purposes for which import permits would be issued would likely reduce the threat of extinction facing lions in South Africa.

17.32(a)(2)(v): The opinions or views of scientists or other persons or organizations having expertise concerning the wildlife or other matters germane to the application:

As with any discussion of hunting, there are numerous opinions on the impact it would have on a species. From reviewing comments made during the listing process for lions, as well as information obtained through personal conversations and literature, there is a general agreement that hunting, done properly and well managed, would not have an adverse effect on lion populations. Mimicking natural process within the management program, such as maintaining pride hierarchy for as long as possible by leaving the alpha male in place, will better ensure the long-term survival of the species. Numerous researchers have stated that, while they may not support hunting in general, see that benefits that can be received through a scientifically based hunting program for lions. There have been a large number of comments from some NGOs and the public opposing hunting any lions, but particularly captive-bred lions. This opposition, however, is primarily based on the perceived ethics of hunting. While these comments are an indication of concerns from some members of the public over hunting, they are not germane to our review process.

Therefore, based on the information available to the Service, there is general support by scientists and other persons or organizations having expertise concerning lions that the legal harvest of lions, and the subsequent import of these trophies, would not have an adverse effect on the species, but would further efforts to conserve the species in the wild into the future.

17.32(a)(2)(vi): Whether the expertise, facilities, or other resources available to the applicant appear adequate to successfully accomplish the objectives stated in the application:

Based on our understanding of the permitting process under ToPS, reserves that maintain wild-managed lions must establish biodiversity plans for managing the reserve that take into consideration the long-term survival of all species on the reserve, including large predators. This oversight by DEA and the implementation of the BMP establishes a framework in which reserves manage their wildlife. The long-term survival of lions, at least in South Africa, is tied directly to the success, both ecologically and economically, of the reserves. The reserves that have been permitted to maintain wild-managed lions and, as part of the management program, carry out limited hunting, have the expertise and facilities to maintain lions successfully.

Therefore, based on the information available to the Service, that applicants that are hunting on properly permitted reserves that carry out their management practices in accordance with national and provincial regulations, have the expertise, facilities, or other resources available to them to successfully accomplish the objective their application; i.e., the long-term survival of lions in South Africa.

Conclusion

Given the current status of wild and wild-managed lions within South Africa and the level of management and oversight provided to them, it appears that harvest and import of these lions as trophies meets the purposes of the ESA. As stated earlier, each application received by the Service for the import of a sport-hunted trophy lion from South Africa will be evaluated on a case-by-case basis. The applicant must have hunted on a properly licensed reserve that is actively managing lions in a manner that will maintain the species on the reserve in a manner that mimics natural processes. The Government of South Africa must continue to implement the BMP in the manner identified in the document. The on-going adaptive management and limited off-take of lions is important to the survival of lions in South Africa and the Service will continue to monitor the situation to determine if any revision to this finding is required.

Therefore, with the information currently available that would enable the Service to make such a finding in accordance with the general considerations laid out above, the Service is able to make a determination that the import of wild and wild-managed lions would meet the issuance criteria under 50 CFR 17.32. Therefore, until additional information becomes available that would affect this finding, the Service **is able to authorize the import of wild and wild-managed lion trophies from South Africa**. In accordance with the 4(d) rule for *P. l. melanochaita*, 50 CFR 17.40(r), the Service will review each application received for import of such specimens on a case-by-case basis and each application also needs to meet all other applicable permitting requirements before it may be authorized.

REFERENCES:

Bauer, H., Nowell, K., & Packer, C. (2008). *Panthera leo*, IUCN 2010. IUCN Red List of Threatened Species. Version 2010.4.

Biodiversity Management Plan for the Lion (*Panthera leo*) in South Africa (BMP; December 2015):
Funston, P. J. & Lavendal, M. (2015). Biodiversity Management Plan for the Lion (*Panthera leo*) in South Africa. Department of Environmental Affairs, Republic of South Africa. 63 pp

Björklund, M. (2003). The risk of inbreeding due to habitat loss in the lion (*Panthera leo*)
Conservation Genetics, 4, 515-523

Cousins, J. A., Sadler, J. P., and Evans, J. (2010). The challenge of regulating private wildlife ranches for conservation in South Africa. *Ecology and Society* XX(YY): ZZ. [online]
URL: https://www.researchgate.net/profile/Jonathan_Sadler/publication/44854322_The_Challenge_of_Regulating_Private_Wildlife_Ranches_for_Conservation_in_South_Africa/links/0c960514ca0b84f295000000.pdf

Creel, S., Becker, M. S., Durant, S. M., M'soka, J., Matandiko, W., Dickman, A. J., & Stanley Price, M. (2013). Conserving large populations of lions—the argument for fences has holes. *Ecology letters*.

Crowley, K., and Mokhema, T. (2014). Lions Hunted to Save Rhinos in South African Circle of Life. Bloomberg [online] URL: <http://www.bloomberg.com/news/articles/2014-08-19/lions-hunted-to-preserve-rhinos-in-south-african-circle-of-life>

Dolrenry, S., Stenglein, J., Hazzah, L., Lutz, R.S. and Frank, L. 2014. A Metapopulation approach to African lion (*Panthera leo*) conservation. PLoS ONE 9(2): e88081. Doi: 10-1371/journal.pone.0088081.

Ferreira, S.M. and Hofmeyr, M. 2014. Managing charismatic carnivores in small areas: large felids in South Africa. South African Journal of Wildlife Research 44(1):32-42.

Graham-Rowe, D. (2011). Endangered and in demand. Nature 480 (22 December 2011): s101-s103.

Gratwicke, B., Mills, J., Dutton, A., Gabriel, G., Long, B., Seidensticker, J., Wright, B., You, W. & Zhang, L. (2008). Attitudes toward consumption and conservation of tigers in China. PLoS ONE 3 (7): e2544.

Hunter, L.T.B., Pretorius, K., Carlisle, L.C., Rickelton, M., Walker, C., Slotow, R. and Skinner, J.D. (2007). Restoring lions *Panthera leo* to northern KwaZulu-Natal, South Africa: short-term biological and technical success but equivocal long-term conservation. Oryx 41:196-200.

IUCN Species Survival Commission (2012). Guiding Principles on Trophy Hunting as a Tool for Creating Conservation Incentives, Ver. 1.0. IUCN SSC 2012.

IUCN Species Survival Commission (SSC) Cat Specialist Group. (2006a). Regional Conservation Strategy For The Lion *Panthera leo* In Eastern and Southern Africa. 60 pp.

Kettles, R. and Slotow, R. (2009). Management of free-ranging lions on an enclosed game reserve. South African Journal of Wildlife Research 39:23-33.

Lindsey, P., Alexander, R., Balme, G.A., Midlane, N. & Craig, J. (2012b). Possible relationships between the South African captive-bred hunting industry and the hunting and conservation of lions elsewhere in Africa. South African Journal of Wildlife Research 42 (1), 11-22.

Miller, S.M., Bissett, C., Burger, A., Courtney, B. and Dickerson, T. (2013). Management of reintroduced lions in small, fenced reserves in South Africa: an assessment and best practice guidelines. South African Journal of Wildlife Research 43(3):138-154.

Miller, S.M and Funston, P.J. (2014) Population growth rates of lions (*Panthera leo*) on small fenced reserves in South Africa: a management dilemma. South Africa Journal of Wildlife Research 44:43-55.

Oliveier, P.J., Van Aarde, R.J., and Ferreira, S.M. (2009) Support for a metapopulation structure among mammals. Mammal Review 39:178-192.

- Packer, C., Brink, H., Kissui, B.M., Maliti, H., Kushnir, H., and Caro, T. (2011) Effects of trophy hunting on lions and leopards in Tanzania. *Conservation Biology*. 25:142-153.
- Packer, C., Swanson, A., Canney, S., Loveridge, A., Garnett, S., Pfeifer, M., ... MacNulty, D. (2013). The case for fencing remains intact. *Ecology Letters* 16: 1414-e4.
- Riggio, J., Jacobson, A., Dollar, L., Bauer, H., Becker, M., Dickman, A., ... Pimm, S. (2013). The size of savannah Africa: a lion's (*Panthera leo*) view. *Biodiversity and Conservation*, 22(1), 17-35.
- Slotow, R. and Hunter, L.T.B. (2009) Reintroduction decisions taken at the incorrect social scale devalue their conservation contribution: the African lion in South Africa. in: M.W. Hayward and M.J. Somer (eds). *Reintroduction of Top-Order Predators*. pp. 41-73. Wiley-Blackwell, Oxford.
- South Africa (2004). National Environmental Management Biodiversity Act 10 of 2004. www.gpwonline.co.za
- Tambling, C.J. and du Toit, S.T. (2005) Modelling wildebeest population dynamics: Implications of predation and harvesting in a closed system. *Journal of Applied Ecology* 42:431-441.
- Trinkel, M., Ferguson, N, Reid, A., Reid, C., Somers, M. et al. (2008) Translocating lions into an inbred lion population in the Hluhluwe iMfolozi Park, South Africa. *Animal Conservation* 11:138-143.
- Tinkel, M., Funston, P., Hofmeyr, M., Hofmeyr, D., Dell, S., Parker, C., and Slotow, R. (2010) Inbreeding and density-dependent population growth in a small, isolated lion population. *Animal Conservation* 13:374-382.
- USFWS (2015) Final ESA listing rule for *Panthera leo leo* and *P. l. melanochaita*. 80 Fed. Reg. 79999.
- Williams, V.L., Newton, D.J., Loveridge, A.J., & Macdonald, D.W. (2015). *Bones of Contention: An Assessment of the South African Trade in African Lion Panthera leo Bones and Other Body Parts*. TRAFFIC, Cambridge, UK & WildCRU, Oxford, UK.
- World Bank. 2015. The World Bank Annual Report 2015. Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/22550> License: CC BY 3.0 IGO.