Pointless: A quantitative assessment of supply and demand in rhino horn and a case against trade

Barbara Mass
NABU International Foundation for Nature

The world is witnessing an unprecedented upsurge in poaching and illegal wildlife trade, which is undoing decades of conservation efforts. Some of the most profitable species include iconic animals such as rhinos, elephants, tigers and even fish. The notion that wildlife trafficking is worth 7-23 billion US dollars (UNEP-Interpol 2016) and ranks amongst the four most lucrative illicit trade commodities has become cliché. Rhinos have been especially hard hit by these developments. Last year, poachers killed at least 1,342 rhinos in Africa, the highest number since records began in 2006. Rhino populations everywhere are under siege from poachers, illegal traffickers, national and international criminal networks, art collectors, status and pleasure seekers, medical patients and financial speculators intent on cashing in on their increasing rarity. Most wildlife and enforcement experts consider resolutely enforced international and national trade bans and effective demand reduction initiatives the most promising route towards reversing the current trend. Others vociferously advocate the legalization of trade in rhino horn as the only viable option that can ensure a future for the world's remaining rhinos. The debate about whether legalized rhino horn trade might benefit rhino conservation has produced an abundance of academic and other publication, which include a large number of theory-based analyses. A quantitative appraisal of supply and demand has so far been lacking. This study provides the first quantitative assessment of the relationship between rhino horn supply and demand. Scrutinizing a variety of different supply and demand scenarios it illustrates the significant discrepancy between the reservoir of approximately 141 tonnes of horn carried by the world's remaining rhinos and those in South Africa and the two main consumer markets in Vietnam and China.

Directing rhino metapopulation management 'best practice' during a poaching crisis

Pedersen G.[1], vonHoldt B.M.[2], Irons P.[1]
[1] Department of Production Animal Studies, Faculty of Veterinary Science, University of Pretoria
[2] Ecology and Evolutionary Biology, Princeton University

The white rhino, *Ceratotherium simum Burchell*, has been conservation dependent since their first major recorded population crash in 1885. Prior to the poaching spike of 2008, management-related losses such as fighting mortalities and overstocking-induced unborn calves exceeded those of poaching in South Africa. However, the country has recently reached the point where poaching mortalities have exceeded natural birth rates. The focus of this research is to assess critical rhino metapopulation management questions arising at this time of population decline, to develop proactive best practice protocols for species recovery. And more significantly, this study will apply these new data as a biological management tool for the future, in accordance with the WWF and IUCN/AfRSG Rhino Action Plans, to maximize the genetic fitness of a consistently threatened species of integral economic and ecological importance to Africa. Utilizing baseline population genetic data and ecological and evolutionary modelling techniques such as Population Viability Analysis, we are able to address metapopulation level genetic questions pertaining to reintroductions, reproductive success and population growth. The first aspect investigated the levels of relatedness in social groupings of rhinos in effort to advise managers on the genetic implications of translocating rhinos from close and overlapping geographic ranges. The second aspect to be reported on here is the establishment of breeding values of dominant bulls with range/territory data and horn size included as parameters, in order to better understand the optimal length of term that

dominant bulls are allowed to reign and whether there is any element of heritability with these dominance traits. The development of a rhino population genetic management 'best practice' guide will improve our understanding of synergistic components involved in reintroductions and translocations, and subsequently enhance the efficacy of future rhino movements around Africa in response to the current poaching crisis.

Recurrent keratitis in captive Asian elephants

Avni-Magen, N[1]; Kahila Bar Gal,G[2] ; Ofri, R[2]
[1]Tisch Family Zoological Gardens in Jerusalem (the Jerusalem Zoo)
[2]The Koret School of Veterinary Medicine, Faculty of Agricultural, Food and Environmental Quality Sciences, The Hebrew University of Jerusalem

Clinical signs of keratitis are seen among the Asian elephants at the "Tisch Family Zoological Gardens in Jerusalem", Israel. Signs are bilateral and included severe photophobia, blepharospasm, copious sero-mucoid discharge, and progressive corneal edema so severe that it led to loss of vision. The inflammation subsequently resolved, though residual corneal pigmentation and infiltration were observed. Subsequently, at roughly three to four month intervals, episodes would reoccur. In spite of intensive diagnostics efforts no clear pathogen was detected. Diagnostic examinations included culture for viruses, bacteria, fungi, Mycoplasma, and Chlamydia. Conjunctival biopsy revealed chronic lymphoplasmatic inflammation of unknown etiology. PCR tests for Elephant Endotheliotropic Herpesviruses (EEHV) were conducted on blood, lymph node biopsy, conjunctival swabs, tears and wart like lesions on the vulva at the IZW lab in Berlin and all were negative. Repeated blood work was consistently normal. No significant differences were noted between several treatment regimens, including combinations of topical and systemic treatment including local antibiotics, anti-herpes ointment, anti-viral drops, anti-fungal drops, anti-inflammatory drops (steroids and NSAIDs), autologous serum eye drops, mydratics, systemic anti-inflammatory and anti-herpes drugs. There is no apparent correlation with seasonal, environmental or management changes. Over the last 20 years there have been 30 outbreaks, at increasing intervals and with decreasing severity. During the last few outbreaks, skin lesions including lichenification, vesicles and crusts appeared, first along the lateral edge of both ears then along the dorsal trunk. Clinical signs resolved after topical treatment. There are literature reports of ocular disease in elephants, including follicular conjunctivitis, traumatic corneal injuries, foreign bodies etc. Positive EEHV PCR results from conjunctival swabs of healthy elephants have been reported, raising the possibility that they are part of the normal conjunctival flora in elephants. During the last year we evaluated the use of next generation sequencing to screen for the pathogens associated with the inflammation. Comparison of the flora in the right and left eye of each individual during and after keratitis outbreak was conducted. The analysis enabled the study of the "normal" versus the inflamed flora which included bacterial, fungi and viral pathogens. Differences were found between individuals especially between the females and the bull.