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Commentary

Why Inter-Country Loans Will Not Help Sumatra's Elephants

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Asian elephants (*Elephas maximus*) in western zoos are likely to become extinct unless elephants are regrouped into breeding units or additional elephants are imported from range States. There have been proposals for the export of elephants from elephant camps in Sumatra, Indonesia. In exchange, zoos would be expected to provide funds or support 'in kind' for the camps or for the conservation of wild elephants. Most of the elephants in the Sumatran camps were captured because of crop-raiding problems around protected areas or because elephant habitat has been and continues to be lost to development schemes and illegal conversion of protected areas to agriculture. Capture-related mortality rates are high and conditions in the camps are poor, with low standards of veterinary care and husbandry. This is partly due to over-crowding and inadequate budgets. It might seem, therefore, that the loan of elephants to western zoos would improve the lot of these elephants and reduce the pressures on the camps. However, we show that both total and annual demand for Asian elephants, and particularly Sumatran elephants (*E. m. sumatranus*), by western zoos are low, and consequently the resources generated by any loan scheme would be limited. Elephant loan schemes are unlikely to have significant beneficial

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impact on either the conservation or welfare of elephants in Sumatra. More importantly, a credible loan scheme would require a permanent moratorium on the capture of wild elephants in Sumatra. Such a moratorium is needed to prevent illicit captures for sale or loan. At present, wild elephants are caught to replace those that die at the camps or are moved to other facilities. Without a moratorium, the loan of elephants to overseas zoos would contribute directly to reductions in wild elephant populations in Sumatra. However, a moratorium is likely to prove impossible to enforce, and this alone should call into question the desirability of any loan scheme. Zoo Biol 25:235–246, 2006.

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INTRODUCTION

Asian elephants in western zoos are in crisis. An imbalance in sex ratios, the emergence of new diseases; and poor reproductive success have compromised the long-term viability of these captive populations [Taylor and Poole, 1998; Dorresteijn and Terkel, 2000; Wiese, 2000; Dorresteijn, 2001; Rees, 2003a]. There are also serious concerns about the welfare of zoo elephants; and many of these welfare issues are intimately linked with the poor reproductive performance of the captive populations [Taylor and Poole, 1998; Poole and Taylor, 2001; Clubb and Mason, 2002]. Not surprisingly, there have been calls for a halt to the breeding and importation of elephants until the factors responsible for poor welfare have been identified and remedied [Clubb and Mason, 2002]. Furthermore, Rees [2003a,b] suggests that there is no realistic prospect of establishing self-sustaining captive populations of Asian elephants in western zoos. He argues that it may be more productive to use the existing animals in western zoos as ambassadors to raise money for in situ conservation in the range states until they die out naturally.

It has been estimated that if four elephants per year were imported to the North American Asian elephant population it would be possible to maintain the population at its current level [Wiese, 2000]. However, as Wiese notes, the assumptions of his population model are optimistic, and consequently a larger annual rate of import may prove necessary. Wiese further argues that the Asian elephant is a perfect candidate for the establishment of extractive zoo reserves. This concept envisions the intensive management of habitat reserves so that wild populations can sustain an extractive harvest for the use of zoos [Conway, 1998]. There are Asian elephant populations in timber camps in India and elsewhere in Asia that are reported to be self-sustaining or growing [Sukumar et al., 1997; Taylor and Poole, 1998], and Wiese has suggested that these camps may be a source for trial extractions, preferably of captive bred elephants. Importing animals from Asian elephant camps has, however, been rejected by the European zoos' elephant breeding program [Dorresteijn and Terkel, 2000].

Indonesia also has a number of elephant camps, known as Elephant Conservation Centers (ECCs, formerly Elephant Training Centers, ETCs), and there have been several proposals for the loan of ECC elephants to overseas zoos for breeding or exhibition. These proposals have been discussed recently at several meetings including the 'International Conference on the Domesticated Elephant' in Bangkok, Thailand (February 2001), the 'Sumatran Elephant Workshop: Husbandry and Veterinary Aspects of the Elephant Training Centers' in Cisarua, Indonesia

(April 2001), and the 'Workshop on Captive Sumatran Elephant Management' in Palembang, Indonesia (June 2002). These elephant loan proposals have generally assumed that elephants from the ECCs would be loaned to zoos or other institutions outside Indonesia. The elephants would remain the property of Indonesia, but would be loaned either permanently or for a fixed term to these overseas zoos. In exchange, the zoos or other institutions receiving elephants would provide funds or support 'in kind' (e.g., medical supplies and veterinary support) that would be used for the conservation of wild elephants on Sumatra and to improve conditions in the ECCs. There has generally been an emphasis on improving conditions in the ECCs. Recent proposals have suggested that all funds raised would be fed into a 'Sumatran Elephant Trust Fund,' and that this Trust Fund would be responsible for making money available to the ECCs and elephant conservation projects. The ECCs and other projects would have to submit proposals to the Trust Fund for evaluation.

In September 2001, we prepared a discussion document with the aim of assessing the implications both positive and negative of the proposed ECC elephant loans [Hedges et al., 2001]. The document was circulated to over 200 people involved in elephant issues. We compiled and synthesized the responses we received and this synthesis was presented in a second report, which we circulated in May 2002 [Hedges et al., 2002]. Both documents were made available in English and Indonesian versions, and were circulated to Government of Indonesia officials and Indonesian scientists and NGOs. In the present article, we summarize the negative and positive aspects of the proposed loans, report the conclusions of the debate stimulated by our reports, and provide additional insights based on our experience of working on elephant issues in Sumatra.

BRIEF HISTORY OF THE INDONESIAN ELEPHANT CAMPS

The first ECC was established in 1986 to hold elephants captured because of crop-raiding problems around protected areas and because elephant habitat was being lost to development schemes [Santiapillai and Ramono, 1993; Tilson et al., 1994; Lair, 1997; Hedges et al., 2005]. By 1996, there were six ECCs and a total of about 570 elephants had been captured [Lair, 1997]. Elephant capture rates fell as a result of the financial and political crises in Indonesia in the late 1990s, but have returned to pre-crisis levels in some parts of Sumatra (most notably in Riau Province) [Hammatt and Fahrimal, 2003]. Part of the original justification advanced for catching Sumatran elephants was that they would be used in reduced impact logging operations, and for patrols and elephant-based ecotourism in Sumatra's national parks [McNeely, 1978; Lair, 1997]. To date there has been little such use of ECC elephants [Groning and Saller, 1998; Suprayogi et al., 2002]. Significant numbers have been disbursed to zoos in Indonesia but it is far from clear that zoo placement in any of these cases has benefited Sumatran elephant conservation. There are currently about 400 elephants in the ECCs (International Elephant Foundation, unpublished data).

Unfortunately, these ECCs represent a serious and ongoing elephant welfare problem because standards of health and husbandry at the centers are poor, and the centers are overcrowded, under-resourced, and poorly managed [Lewis, 1998; Lilley and Saleh, 1998; Mikota et al., 2000a; Suprayogi et al., 2002; Hammatt and Fahrimal, 2003]. For example, the budget for veterinary supplies is inadequate and

most of the ECCs hold insufficient injectable antibiotics to treat even a single adult elephant correctly [Suprayogi et al., 2002]. Nevertheless, since 1997–1998, >50% of the annual national budget for elephant conservation was reportedly allocated to the ECCs [Hutadjulu and Janis, 2002]. It has been suggested, therefore, that loaning ECC elephants to western zoos would improve the welfare of these elephants, reduce the pressures on the ECCs, and free resources needed for other elephant conservation projects in Sumatra.

TAXONOMIC STATUS OF SUMATRAN ELEPHANTS AND IMPLICATIONS FOR INTER-ZOO LOANS

Although subspecies taxonomy of *Elephas maximus* has varied among authors, the most recent treatment [Shoshani and Eisenberg, 1982] recognizes three subspecies: *E. m. indicus* on the Asian mainland, *E. m. maximus* on Sri Lanka, and *E. m. sumatranus* on the Indonesian island of Sumatra. Borneo's elephants have traditionally been included in *E. m. indicus* [Shoshani and Eisenberg, 1982] or *E. m. sumatranus* [Medway, 1977; but see Fernando et al., 2003]. These subspecies designations were based primarily on body size and minor differences in coloration, plus the fact that *E. m. sumatranus* has relatively larger ears and an extra pair of ribs [Shoshani and Eisenberg, 1982]. The Sri Lankan subspecies designation is weakly supported by analysis of allozyme loci [Nozawa and Shotake, 1990], but not by analysis of mitochondrial DNA (mtDNA) sequences [Hartl et al., 1996; Fernando et al., 2000; Fleischer et al., 2001]. However, current patterns of mtDNA variation suggest that the Sumatran subspecies is monophyletic and diagnosable, and consequently this taxon could be defined as an evolutionarily significant unit [Fleischer et al., 2001]. This suggests that Sumatran elephants should be managed separately from other Asian elephants in captivity, and is also an argument for according particularly high priority to the conservation of Sumatran elephants in the wild.

Currently, the American Association of Zoos and Aquarium's Elephant Taxon Advisory Group and Species Survival Program (AZA Elephant TAG/SSP) considers elephants from Sri Lanka and the Asian mainland as one gene pool and there are no Sumatran elephants in the United States. Furthermore, it is highly likely that the AZA Elephant TAG/SSP would only support the import of Sumatran Elephants into AZA accredited zoos in the United States if they were treated as Asian elephants available for breeding with the entire North American Asian elephant gene pool (J. Lehnhardt, AZA Elephant TAG/SSP, personal communication). This would seem undesirable, given the taxonomic status of Sumatran elephants [Fleischer et al., 2001], and suggests that United States zoos are likely to seek Asian elephants from elsewhere in Asia. Similar concerns likely apply to European, Australasian, and other regional zoo associations. There is simply not enough space in zoos to maintain breeding populations of two Asian elephant taxa. Nevertheless, a formal review of the regional zoo associations' policies with respect to Sumatran elephants is needed.

STATUS OF SUMATRAN ELEPHANTS IN THE WILD

In the mid-1980s, 44 discrete elephant populations were known to exist in Sumatra's eight provinces, 12 of these were in Lampung Province [Blouch and

Haryanto, 1984; Blouch and Simbolon, 1985]. By 2003, however, only three of Lampung's 12 populations were extant [Hedges et al., 2005]. An unknown number of Sumatra's other elephant populations remain [Blake and Hedges, 2004], and those that do are threatened by habitat loss, poaching, and as a result of conflict with humans [Santiapillai and Jackson, 1990; Hedges et al., 2005]. Nevertheless, the island is thought to hold some of the most significant populations outside of India. For example, recent surveys in Lampung Province's two national parks, Bukit Barisan Selatan and Way Kambas, produced population estimates of 498 (95% confidence interval [CI] = [373, 666]) and 180 (95% CI = [144, 225]) elephants, respectively [Hedges et al., 2005]. Bukit Barisan Selatan NP is thus a critically important area for Asian elephant conservation. The challenge is to protect these populations from further habitat loss and poaching.

DEMAND FOR ASIAN ELEPHANTS

Although several zoos and other institutions are known to want Asian elephants in the near future, it is clear that overall demand is limited, probably fewer than 100 animals over the next 20 years (J. Lehnhardt, AZA Elephant TAG/SSP, personal communication). Furthermore, it is possible that long-term demand will be reduced as accredited zoos aim to overcome current husbandry and welfare problems to create self-sustaining captive populations. To our knowledge, zoos, and other animal collections in the United States, Canada, Spain, Germany, Australia, and Japan have expressed an interest in obtaining elephants from Sumatra. In some cases this was because they thought this would help improve conditions at the ECCs. However, elephant loans are unlikely to significantly reduce the pressures on the ECCs in Sumatra because accredited zoos' capacity to receive ECC elephants is very limited and consequently few animals would be removed from the ECCs. Furthermore, we believe there is a danger that by appearing to be a solution to the crisis in the ECCs, a loan scheme would delay the necessary and long overdue review of the rationale for, and management of, these centers. In other words, loans to western zoos cannot solve the problem of 'surplus' elephants in Sumatra, or indeed elsewhere in Asia [Sukumar, 2003].

Recent advances in the techniques of artificial insemination in Asian elephants [Anonymous, 20000] suggest that export of elephant semen may provide an alternative to the export of live elephants. This would remove the expense and difficulty of moving live elephants but it is unclear whether exporting semen would be beneficial for the conservation of wild elephants or the welfare of elephants living in the ECCs. Moreover, this technology remains in its infancy and will require further refinement before it could be considered a routine alternative to elephant loans [Wiese, 2000].

LEGAL ISSUES

All Asian elephants are included in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Although the inclusion of a species in Appendix I restricts trade in that species it does not render such trade illegal. Providing the provisions of Article III of the Convention are followed, Indonesia would be allowed to export elephants, and other

States including other CITES Parties, would be allowed to import these elephants. Under Article III of the Convention, Appendix I species may be exported for commercial purposes but their import must be only for primarily non-commercial purposes. Indeed, the CITES Secretariat is aware of other elephant range States that trade elephants captured during problem animal control operations to, for example, non-commercial zoologic institutions: this is legal (J. Sellar, CITES Secretariat, personal communication). It is not clear, however, whether such loans would be legal under Indonesian law, because elephants held captive in the ECCs are considered to be wild animals under Indonesian law [Suprayogi et al., 2002], and Law No. 5 of 1990 (and amendments PP No. 7, 1999 and PP No. 8, 1999) forbids the export of wild elephants. This needs to be clarified, not least because the legality of elephant loans under Indonesian law determines whether such loans would contravene Article III of the Convention, which includes the clause, 'Article III 2(b) a Management Authority of the State of export is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora.'

Of equal importance for compliance with Article III is the clause, 'Article III 2(a) a Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of that species.' Because elephant capture operations were very largely responsible for the loss of 9 of 12 wild elephant populations in Sumatra's Lampung Province between 1984 and 2002 [Hedges et al., 2005], and elephants are still being caught in large numbers elsewhere in Sumatra, it seems likely that continued capture operations pose a threat to the survival of the Sumatran elephant. Therefore, a permanent moratorium on capturing further wild elephants would be required to avoid contravening Article III of the Convention. Similar concerns apply regarding the U.S. Endangered Species Act.

SELECTION OF SUITABLE ELEPHANTS AND DISEASE ISSUES

The selection of suitable elephants for any loan scheme may be problematic. For example, temperament and reproductive potential may be difficult to assess; similar concerns exist over the animals' ability to survive transportation and quarantine. In addition, more thought needs to be given to the health implications of the proposed loans, not least because tuberculosis and herpes are major problems in western zoos. These emerging diseases have increased the risks associated with the movement of elephants between collections [Mikota et al., 2000b; Richman et al., 2000; Ryan and Thompson, 2001; Clubb and Mason, 2002; Rees, 2003a]. A further concern is that animals on loan could become infected and thus could infect other Indonesian animals if they were returned to Indonesia, although this is unlikely to be a serious problem in practice as any loans are likely to be for indefinite periods. Clearly, Indonesian elephants could also be a source of infection for resident elephants in zoos unless stringent pre-shipment health-screening protocols were established.

MONEY OR 'IN KIND' SUPPORT GENERATING POTENTIAL OF ELEPHANT LOANS

The levels of support generated by elephant loans schemes are likely to be low. After transport costs are paid, it seems unlikely that more than about US$10,000–20,000 per animal would be available to invest in elephant conservation

projects (J. Lehnhardt, AZA Elephant TAG/SSP, personal communication). Thus elephant loans would generate a relatively small amount of money with the overall income being limited by the low demand for Sumatran elephants from accredited zoos. In contrast, a major investment is needed to raise standards at the Sumatran ECCs to acceptable levels. Elephant loan schemes are unlikely therefore to have a significant beneficial impact on either the conservation or welfare of elephants in Sumatra.

Support 'in kind,' such as the provision of medical supplies and veterinary support, vehicles, or electric fencing, is likely to be more appropriate than provision of funds because it is easier to monitor and because of its more direct link to elephant conservation and welfare. Nevertheless, provision of support 'in kind' will also be unlikely to have a significant long term impact because of the limited funds available to accredited zoos and the overall low demand for Sumatran elephants.

MANAGEMENT AND UTILIZATION OF FUNDS OR SUPPORT IN KIND

Despite its popularity among the Indonesian institutions promoting the loan of Sumatra's elephants, it is not clear that a 'Sumatran Elephant Trust Fund' would be the most appropriate way to manage the funds generated by any loan scheme. Alternatives, such as some form of endowment fund, may be more widely accepted and be cheaper to administer. If loans were to occur, further discussion would be needed about the management of any fund. It is clear, however, that there would be a need for: 1) complete transparency; 2) independent auditing; and 3) international conservation NGOs and accredited zoos to be given a voice on the board of any fund. Other questions, such as who would be responsible for appointing the fund's board remain unresolved. Furthermore, all projects or institutions receiving funds or support 'in kind' would need to be monitored by independent observers to ensure that money and other resources are used for their intended purpose.

From the discussions stimulated by our earlier reports on elephant loans, it was clear that opinion was split over whether the money or support 'in kind' generated by loans of Sumatran elephants should be used for wild or ECC elephants, or both. Further thought would need to be given to this question if loan schemes are to be pursued. The question of how money or support 'in kind' would be disbursed would also require further discussion. For example, would ECCs, protected area managers, and elephant conservation projects have to submit proposals to the Sumatran Elephant Trust Fund explaining why they needed support? If so, who would evaluate such proposals? The best method for achieving a fair and appropriate distribution of funds or support in kind remains unclear, but an advisory board of some kind would likely be necessary as discussed above.

PARTICIPATING ORGANIZATIONS AND LOAN TERMS

If loans of Sumatran elephants were to go ahead, we believe only accredited zoos and other institutions should be involved. This would likely restrict participating institutions to those accredited to the American Zoo and Aquarium Association (AZA), the European Association of Zoos and Aquaria (EAZA), and other credible zoo associations.

Any loans should be for indefinite periods. Loan agreements are likely to be written so that the receiving institution will pay to get the animals and will pay for

their return to Indonesia if the zoo decides that it no longer wants to keep the animal; whereas if Indonesia asks for the return of an elephant, the costs of returning the animal would be met by Indonesia. Strict conditions for onward loans would need to be included in any loan agreements. The rights of recipient institutions to loan their elephants to other organizations would need to be clearly stated and controlled. Any loan agreements would also need to be very clear about who would own any offspring born to the elephants on loan.

Paying in installments is preferable to one-off payments. Although zoos may prefer one-off payments, installments are likely to facilitate better management and utilization of the funds by the recipients. Paying in installments also allows for the possibility of sanctions, for example if the terms of any linked moratorium on capturing wild elephants were broken.

IMPACT OF ELEPHANT LOANS ON IN SITU ELEPHANT CONSERVATION PROJECTS

Elephants are high-profile charismatic species. The welfare of elephants, particularly captive elephants, receives a lot of publicity. Previous discussions of elephant loan schemes have generated a lot of opposition among both Indonesian and international NGOs (particularly those concerned with animal welfare issues). We argue, therefore, that elephant loan schemes have the potential to harm in situ elephant conservation projects if, for example, the zoos that support many such projects were to receive Sumatran elephants under what would undoubtedly be controversial loan schemes. In addition, we believe that elephant loan schemes are a dangerous distraction from the real problems facing Sumatra's wild elephant populations, which are threatened by habitat loss, poaching, and human–elephant conflict [Hedges et al., 2005].

NEED FOR ANY ELEPHANT LOAN SCHEME TO BE LINKED TO A MORATORIUM ON CAPTURING WILD ELEPHANTS

We believe that a permanent moratorium on capturing wild elephants in Sumatra is needed to preclude illicit captures for sale or loan. At present, wild Sumatran elephants are often caught to replace those that die at the ECCs or are moved to other facilities (including overseas zoos). This is because ECC budgets are based on the number of elephants held at each centre, providing an incentive to capture elephants regardless of need. One of us (HH) was directly informed by two separate ECC managers and the Head of the Natural Resource Conservation Agency office in Riau Province (BKSDA-Riau) that elephant numbers are maintained by new captures to ensure the maximum allowed flow of funds from the Ministry of Forestry. Adi Susmianto, former Director of Biodiversity Conservation within the Ministry of Forestry, has stated that this is not the Ministry's policy, but at least in Riau, the provincial authorities view the upper limit of elephants as their target number. Furthermore, capture-related mortality rates are often very high. Records compiled by Hammatt and Fahrimal [2003] indicate 117 known captures of wild elephants from Sumatra's Riau Province between September 2000–March 2003. Seventy-four of these elephants were placed in the Riau ECC and 43 were translocated to other forest blocks in central Sumatra. Of the 74 new

captures taken to the ECC, 63 were dead by June 2003; three more elephants were expected to die due to documented injuries and infections, and four had been 'lost in the forest' (i.e., released because they were seriously ill and the camp managers did not want them to die in the ECC). Only four were expected to live. In addition, of the 43 elephants known to have been translocated, Hammatt and Fahrimal predicted that 39 of these would die based on known death rates among newly captured elephants, physical examinations, and the results of clinical tests on translocated elephants.

We suggest, therefore, that without a permanent moratorium on capturing wild elephants, the loan of ECC elephants to overseas zoos could contribute directly to reductions in wild elephant populations in Sumatra. We believe that a moratorium would be impossible to enforce, however, and that this alone should call into question the desirability of any loan scheme.

If an elephant loans scheme were to be initiated, a registration and identification system for ECC elephants would be needed to allow compliance with the moratorium on capturing wild elephants to be assessed. Such a registration scheme would have many other benefits and would greatly improve the management of the ECCs. Indeed, the urgent need for all domesticated Asian elephant populations to be properly registered has long been recognized: '[In] various countries in Asia, elephants are being captured under dubious circumstances and being sent to unsuitable sites in-country or even sent to other Asian countries under even more dubious circumstances, often resulting in horror stories that never become known to the international conservation or animals rights community. Without proper registration, it is impossible to protect elephants from such abuse' [Lair, 2002].

CONCLUSIONS

The low levels of total and annual demand for Asian elephants mean that the resources generated by any loan scheme (including support 'in kind') would be limited. This suggests that the cost and effort involved in setting up a loan scheme will outweigh the benefits accrued, and elephant loan schemes are unlikely to have significant beneficial impact on either the conservation or welfare of Sumatran elephants, wild or captive.

Sumatran elephants form an evolutionary significant unit, *E. m. sumatranus*, that arguably should not be interbred with other Asian elephants. Few if any accredited zoos currently hold Sumatran elephants. Given that regional zoo associations are unable to maintain two Asian elephant taxa in captivity because of severe limits on space and other facilities, it is likely that demand for Sumatran elephants will be even lower than that for Asian elephants from other range States. A formal review of the regional zoo associations' policies with respect to Sumatran elephants and a clear position statement from the AZA Elephant TAG/SSP and the EAZA European Endangered Species Programme (EEP) is needed.

The legality of elephant loans under Indonesia law needs to be reviewed. At present such loans would seem to be illegal. If this were the case the loans would also contravene Article III of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

The conservation and welfare of elephants receives a lot of publicity and elephant loan schemes are likely to generate much opposition among both

Indonesian and international NGOs (particularly those concerned with animal welfare issues). This has the potential to harm in situ elephant conservation projects if, for example, the zoos that support many such projects were to receive Sumatran elephants under what would undoubtedly be controversial loan schemes.

A credible loan scheme would require a permanent moratorium on the capturing of wild elephants in Sumatra. Such a moratorium is needed to prevent illicit captures for sale or loan; captures that are likely to result in significant numbers of elephants dying as a result of capture-related complications. Without a moratorium, we believe that no international conservation NGO or accredited zoo is likely to support, or should support, an elephant loan scheme. A moratorium is likely to prove impossible to enforce, however, which calls into question the desirability of any loan scheme.

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