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Captive Breeding, Zoos, and Good Sense

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A broad series of criticisms was presented by Snyder et al. (*Conservation Biology* 10:338-348) about the use and abuse of captive breeding as a recovery strategy for endangered species, with special regard to the limits of traditional captive breeding centers. Although some of their arguments are easily divisible (e.g., poor success in reintroductions, high costs, risk of domestication in captive populations), others seem biased from a U.S. perspective and difficult to extend to other countries. Concern about the ark paradigm, which has been in fashion in the zoo community over the last few years, has been expressed by other authors (e.g., Gippoliti 1995; Hutchins & Conway 1996; Rahbek 1993) as the need not to confuse captive breeding for immediate recovery programs (reintroduction in the wild) with captive breeding programs for other purposes (research and exhibit for naturalistic and conservation education). Some of the arguments offered by Snyder et al. (1996), however, are not so univocal. For many species establishing a self-sustaining captive population is no longer a great problem. If it is true that not all endangered species easily breed in captivity, it is also true that breeding success is increasing every year, even for the "difficult" species listed by Snyder et al. (e.g., Aye-Aye [*Daubentonia madagascariensis*], Feistner & Carroll 1993). The New World monkeys of the genus *Leontopithecus* offer an excellent example of a formerly difficult genus, now well established in captivity. The captive population of the golden lion tamarin (*Leontopithecus rosalia*) was on the brink of extinction in the 1970s, but, following a new husbandry protocol, it began to breed well in captivity, establishing a self-sustaining population and supplying individuals for a successful re-stocking program in the Poço das Antas Reserve (Kleiman et al. 1991). Two other species, *Leontopithecus chrysomelas* and

L. chrysopygus, are now breeding well in a number of zoos throughout the world (French et al. 1996). In fact, one of the major problems of many current zoo captive breeding programs is the control of population growth (e.g., van Elsacker et al. 1994).

It is argued by Snyder et al. that captive breeding, when necessary, should be carried out in ad hoc, mono-specific centers located in the country of origin of each species. This view can not be shared by us for three reasons: it is exceptionally expensive and therefore not feasible for the majority of tropical species (see also Conway 1995); owing to political and social conditions, it is not always possible to carry out such long-term ventures in many unstable developing countries; and there should be stronger competition for funds between in situ and ex situ conservation activities, which is one of the problems pointed out by Snyder et al. (see also Schaller 1993 and Rabinowitz 1995).

We welcome any contribution to the understanding of the limits and faults of captive breeding (and zoos) as a conservation tool. We urge prudence, however, in applying solutions to conservation and legislative problems of a country (e.g., in the U.S.) to other parts of the world in which the problems may be absent or negligible. For example, the "careful field studies" and the "comprehensive determination" necessary to recommend a captive breeding program for an endangered species, may represent a realistic goal in the U.S., but they are a mirage in other parts of the world, where the lack of demographic and distribution data make the conservation status assessment of species such as gorilla (not a beetle!) a difficult and sometimes subjective task (e.g., Harcourt 1996).

There is the real danger that denying any conservation value to captive animals in traditional zoos will raise attacks by the anti-zoo movement, which considers it immoral to keep wild animals in captivity for any reason (McKenna et al. 1987) and believe that videos, computers, and virtual reality can egregiously replace live animals.

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Such a tendency is already being felt strongly in Italy, where not only animal rights organizations, but conservation organizations such as WWF and LIPU (the national branch of BirdLife International), are promoting the “electronic zoo” and other experiences of virtual zoos. We share with Snyder et al. the conviction that zoos have an important role to play in wildlife conservation through public education and awareness, research, and in situ conservation programs (Gippoliti 1993; Hutchins & Conway 1996). Yet, given the current biodiversity crisis and the limited economic resources to counteract it, it is not reasonable to give up a priori at the facilities, expertise and public resonance of the old zoos. Through their “prophylactic” captive breeding programs, zoos have enormously increased public awareness of the conservation problems of little-known taxa and, subsequently, of their habitats (e.g., the Pink Pigeon of the Mauritius Island and the Rodrigues bat or the golden lion tamarin of the Atlantic Forest of eastern Brazil).

In Europe a successful reintroduction program led to the re-establishment of the bearded vulture (*Gypaetus barbatus*) in the Alps, through captive-bred animals born in a non-exhibited center and in 21 zoos (Anderegg et al. 1984) without the enormous costs implied by Snyder et al. for similar projects. The pioneering golden lion tamarin conservation program could be much more costly if centered in a unique facility. Furthermore, in programs that adopt the closed-facility approach in the country of origin (as in the case of the Mauritius kestrel [*Falco punctatus*]), in later stages of the project it is advisable to disperse the captive population among different institutions abroad (Jones et al. 1995).

Therefore, we advocate strongly that the “single species, closed facility” paradigm not replace the “ark” paradigm in the conservation community. Further discussion, however, is needed on the best way for zoos to identify and achieve their conservation goals.

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