Conservation Focus: Baiji, Freshwater Dolphin

Introduction

The baiji, a freshwater dolphin, is an entirely distinctive and little-known taxon in its own family. Its range is restricted to the human-dominated and highly distorted and disturbed Yangtze River, a waterway dependent upon by millions of Chinese people. The following three articles highlight one of the most difficult philosophical issues facing conservationists today: Do we knowingly permit such a unique species to become extinct because of the likely complexity, risks, and costs (financial and political) of trying to save it?

There is currently neither the money, government support, nor available habitat to preserve the baiji in the wild. Neither is there the knowledge or resources to breed and save it in captivity or semicaptivity. The philosophical differences expressed in the following perspectives are likely to become commonplace as the impact of environmental destruction and degradation becomes ever more acute and conservation triage becomes a daily event. In the future, the degree to which the conservation community can assess risks and make recommendations under conditions of near-total scientific uncertainty while maintaining an ethical, respectful, and civil demeanor will be a measure of the maturity of our discipline and its members.

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Conservation Options for the Baiji: Time for Realism?

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The baiji, or Yangtze River dolphin (Lipotes vexillifer), has become something of a cause célèbre in conservation biology over the last 15 years due to its high-profile, critically endangered status and the public impact of articles and books such as Last Chance to See (Adams & Carwardine 1990). This species, endemic to the Yangtze River, is thought to be on the verge of extinction due largely to extreme anthropogenic pressures (e.g., dam construction, agricultural and industrial pollution, riverine development, boat traffic, and fishing) associated with living in an exploited habitat, where the surrounding human population is equivalent to as much as 5% of the world’s total. As a result, the Chinese government has categorized the baiji as a grade I national key protected animal.

Some natural and seminatural reserves have been established in the middle and lower reaches of the river, and a conservation action plan for cetaceans of the Yangtze River was approved by the Chinese Ministry of Agriculture in 2001. Attention from the conservation community has given rise to two international workshops, one in 1993 and most recently in 2004 (Zhou et al. 1994; Braulik et al. 2005; Dudgeon 2005). What has emerged is that a solid estimate of the remaining baiji population size is lacking, but it is likely to be extremely small, perhaps <100 individuals (Dudgeon 2005 and references therein). Given the baiji’s extreme rarity and perceived recent negative demographic trends, extinction of this species is thought to be likely in the short term, possibly within the next 25 years (Zhou et al. 1994).

The 2004 workshop focused on strategies for capture, translocation, and ex situ management of the remaining baiji from the Yangtze River as part of a last attempt to
save the species from otherwise inevitable extinction. Two main options were discussed, although no consensus was reached on the optimal approach: (1) translocation of all remaining individuals to a 21-km oxbow lake, originally part of the Yangtze River, at Tian-e-Zhou, Hubei Province, and (2) translocation of individuals to the Institute of Hydrobiology dolphinarium in Wuhan. It was agreed that the one option not available to the conservation community was to leave the remaining population in situ because this would lead to certain extinction. We question the decision to ignore this option in light of evidence on likely chances of success of capture, translocation, and ex situ propagation of the baiji. In doing so, we consider wider conservation implications for Yangtze River biodiversity and especially the fate of the other endemic cetacean, the Yangtze finless porpoise (Neophocaena phocaenoides asioorientalis), the only population of finless porpoise that lives in fresh water.

Our thesis rests on three points: First, the current prospects of capturing a viable group of baiji for conservation (even a nuclear breeding unit) seem extremely improbable given the available evidence. The population in the Yangtze is currently subsisting at very low densities and is almost undetectable with available survey methods, as recent intensive boat-assisted surveys have revealed (Zhang et al. 2003). A field survey carried out as recently as March 2006 by a team from China, the U.S., U.K., and Switzerland failed to locate any baiji in the wild (Dalton 2006). Individuals are occasionally sighted at three sites along the river (e.g., there were three sightings of one to two individuals at two locations in 2004; Braulik et al. 2005), but the prospects for capturing a sufficient number of individuals to establish a demographically and genetically viable ex situ population (see Bryant et al. 1999) seem very remote.

Second, we argue that even in the unlikely event that enough baiji could be captured to launch a viable ex situ program, it is not clear that such a program would increase the probability of survival of the baiji as opposed to leaving the population intact in situ. Apart from the notable exception of a single male (Qi-Qi), who survived in captivity for 23 years, past propagation and survival rates for this species, and for cetaceans in general, are not promising (Dudgeon 2005). To date, although the mean survival time for captive baiji is 1403.3 ± 3018.6 days for captive and seminatural reserve dolphins, including Qi-Qi, mean survival time is only 268 ± 328.5 days if Qi-Qi is excluded, a clear outlier in the data (calculated from Liu and Zhang [2001], Liu et al. [2002], and Braulik et al. [2005]). In addition, no breeding has been recorded in captivity. In contrast to the baiji, these methods have met with more success for the finless porpoise. The survival time of captive finless porpoises is on average 1083.9 ± 1215.6 days (Liu et al. 2002, data for porpoises in the seminatural reserve are not available to our knowledge), and breeding has been observed in both the Wuhan Institute of Hydrobiology dolphinarium and in the seminatural reserve, to which more than 20 individuals have been translocated successfully (Du et al. 2003).

The argument advanced for the imperative of ex situ management (Dudgeon 2005) is that the wild population will in any event go extinct in the near future, thus interventional management would potentially have nothing to lose and everything to gain. However, we question whether an interventional course of action would result in a prolongation of time to extinction for this species. Classical $k$-selected species, and especially populations of larger vertebrates not under direct persecution, have persisted for long periods of time at undetectable densities (e.g., Baskaya & Bilgili 2004; Fitzpatrick et al. 2005). Additionally, the population could conceivably survive for a longer period than currently anticipated by persisting at low densities and evading detection. Under this scenario it remains possible that any future remediation measures could arrive in time to reverse the decline of this species, as has happened, for example, with some previously commercially hunted cetaceans (Branch et al. 2004). Furthermore, given the putative social nature of the baiji, which has been observed swimming in groups during previous surveys (Zhou et al. 1994), any remnants of natural social and foraging behavior may have a higher chance of being maintained if the population is left in situ.

The option of translocating the remaining population to Tian-e-Zhou oxbow lake, a seminatural reserve, has been discussed as an alternative to the dolphinarium. As a natural system that is more controllable than the river itself, it is a potentially attractive compromise between the wild state and captivity. However, the one time this approach was tried (for a single female in 1995) it was not successful. In addition, Tian-e-Zhou has a population of approximately 26 finless porpoises that were translocated previously and are beginning to breed. Translocating baiji to this reserve could compromise the success of the current program with porpoises. Indeed, translocating both species into the reserve was explicitly ruled out during the workshop in 1993 (Zhou et al. 1994), although the recent workshop reversed this decision with the proviso of a phased release and monitoring process. We argue that to introduce remaining baiji into this reserve potentially compromises not only the future of the currently increasing finless porpoise population but would represent a major risk to the baiji due to potential for agonistic interactions, disease transmission, and competition for limited food resources. (The entangled body of the single female released in 1995 was discovered, and it was determined to have been emaciated before it became entangled [Dudgeon 2005].)

Our final point is perhaps a more philosophical one and rests on the role of objective scientific advice in conservation of charismatic organisms. Given the strong evidence
that the baiji is on an irreversible decline toward extinction, we argue that it is the responsibility of the scientific community, using the balance of evidence available, to advise when resources could be instead directed toward a species with a realistic chance of a successful outcome. We believe this scenario applies to the Yangtze finless porpoise. There are fewer than 2000 individuals of this endemic freshwater subspecies surviving in the river (Yu 2003) and ex situ propagation appears realistic on current evidence (Liu et al. 2002). The financial and other resources directed at a failed attempt to capture and propagate baiji could instead potentially be put toward scientific research and conservation efforts to identify the intrinsic and extrinsic factors needed to ensure survival of a viable finless porpoise population in the medium term. It is also possible that any future ameliorative actions designed to conserve the finless porpoise may have a beneficial impact on the few remaining baiji in the Yangtze River.

This last point is a controversial one because it acknowledges, through its concentration on another species, that we are choosing a management option that effectively ignores the extinction risk to the baiji. However, it is our contention that the conservation community is likely to be faced with similar decisions in the coming decades due, in part, to the ongoing extinction debt (Tilman et al. 1994) facing species (especially large mammals) today. Therefore, perhaps it is timely that the conservation community specifically acknowledged this problem and the dilemma it poses. Instead of making unrealistic (and sometimes expensive) management plans aimed at rescuing species that objective evidence suggests cannot be rescued, more effective conservation might result if we took a targeted approach to conserving those species and habitats with the highest likelihood of persistence.

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