

# CONSERVATION OF RARE CRANES: PROBLEMS AND NEW APPROACHES

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Traditional methods of conservation of rare and endangered bird species are limited to creation of protected territories with different level of protection, captive propagation of birds in breeding centers with a hope to release them into the wild, have turned out to be inadequately effective. Population numbers of many rare species has continued to fall. The opportunities for establishing new protected territories are limited and do not even allow to put under protection home ranges of the species with most narrow distribution. Birds raised in captivity turn out to be incapable of surviving in the wild.

We are unable to halt the process of economic development transforming the habitats of rare species. Merely political and social approaches have been found to be inadequate for their conservation. The crisis in the former strategies for protecting rare species conservation was a consequences of the predominantly emotional approaches in appraisal of the situation; our behavior resembled that provided by the assistance of the dilettante: the knowledge for its realization is lacking, but help is necessary.

The crane family has provided an adequate convenient model for analysis of the situation in the conservation of rare bird species. First, within the Palearctic Gruidae are represented both by broadly and narrowly distributed species. Second, an important part of the Holarctic species in the family are already found in the IUCN Red Data Book; their status is still threatened. Third, although the family is limited here to 8 species, these species are found in a wide spectrum of habitats: from extremely transformed by humans (Demoiselle and Common Cranes), through those that have been transformed partially (Red-crowned and White-naped Cranes) or slightly (Hooded Crane) to almost pristine habitats (Siberian, Whooping and Asiatic Sandhill Cranes). Work over many years with the majority of these species has allowed us to come to the following conclusions.

Until recently, for some reason it was considered as appropriate and sufficient to know the approximate number of a vanishing species in order to design and "scientifically substantiate" measures for its preservation. Without doubt, the elaboration of protective measures for species rests upon a foundation of comprehensive knowledge of its biology and, first and foremost, its reproductive biology. But inasmuch as information about this aspect is extremely limited, it seems quite logical to combine research and monitoring. Therefore, after initial study season devoted to preliminary observation and familiarization with the situation (so-called "ground level"), we moved on to monitoring. We monitored seasonally some demographic parameters of the micro-populations of a rare species, its feeding habits, reproduction, molting, phenological phenomena, as well as seasonal and other changes in its habitat, disturbances of the environment due to anthropogenic factors, and the reactions of birds to these changes and disturbances. It is important to indicate that current environmental dynamics and disturbances (the dynamic background against which occurs the reproduction of birds) is hardly more significant than planning than the changes that people are planning for the future.

At that, it needs to be recognized that representatives of Gruidae family have developed in their evolution an extreme version of K-strategy (large body size; late and drawn-out reproduction season; low amount of resources spent for reproduction; single offsprings; long periods of parental care; MacArthur and Wilson, 1967; Pianka, 1970). The overcoming of these evolutionary pathways of cranes has become possible due to stable and predictable seasonal habitats that undergone the relatively insignificant impact of random fluctuations in environmental parameters (Begon et al., 1989). To these must be added that, once having selected the K-strategy, the cranes gradually attained large body sizes and their dependance on naturally fluctuating environmental parameters has become minimal.

Thus, the Gruidae originated and evolved in a relatively stable environment. However, this very feature has made them extremely vulnerable to the drastic changes in the environmental parameters introduced by man. Being incapable, unlike r-strategy species, to respond to these changes quickly and adequately, many species of cranes have found themselves in threatened position.

Considering this background, we suggest the following tactical approaches to the problem:

1. The conservation of rare species has to be based on the foundation of "ground level" investigations and the following monitoring which corrects and specifies protective measures.

2. To reduce individual variation in research and monitoring, both have to be re-oriented toward maximal arsenal of quantitative methods. Such approach would allow us to see the life cycles of cranes "with their own eyes" and to reveal their attitudes to specific anthropogenic changes in their habitats.

3. Conservation of a rare species requires that there be taken into account perspectives of human economic development in the area of this species' home range. Then knowledge of species-specific reactions to direct or indirect impacts of certain human activities in the area has to be obtained and used in conservation of a species.

4. On the basis of data obtained by research and monitoring, a system of measures has to be developed that would soften as much as possible the negative impact of most important elements of anthropogenic press. These measures would also slow down the process of habitat transformation that, in its turn, would increase the probability of development in a rare species of such adaptations that are adequate to the habitat changes, if the pressure of human factors is minimal.

5. The ultimate goal of studies, monitoring and conservation program for a rare species must be a dynamic coordination of its natural requirements with specific features of human economic development in the area under consideration.

Point number 5 may seem overwhelming and too "global", but in real life it turns out to be a system of economically insignificant and inexpensive actions which, when properly and precisely applied, would undoubtedly result in increase of number of a rare species and, probably, — in expansion of it's home range. (We developed such a system for Demoiselle Crane in Ukraine and it proved to be effective in conservation of this species.)

It is important to note that problems of conservation of cranes are also highly specific, being a final product of conservation practices and very high intellectual abilities of these birds. On the most territory of Europe their attitude toward people was a response to an extreme antagonism of man. If during several generations in a row we manage to recognize ourselves as the most aggressive component of ecosystems and learn to control our behavior, — then there is a hope that our descendants will be able to enjoy cranes in the wild. The situation with Red-crowned, White-naped and Hooded Cranes in Japan gives us some ground for such a hope, since there these cranes are completely tame, while in mainland Asia their behavior is extremely shy.

Summarizing, the proposed strategy of conservation of rare cranes is based on two main postulates:

1. Slow, and therefore inadequate adaptive response of cranes to environmental changes caused by man;
2. To expect that the crane will develop adaptations to certain environmental changes, these changes have to be slowed down to some degree.

A possible way to develop such a strategy is to create protected territories of new type, that would cover the entire distribution range of a threatened species and provide such mode of economic development that minimizes the conflict between human activities and ecological requirements of this species.

## LITERATURE CITED

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