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ADAPTATION OF PREDATORY BIRDS TO ALTERED ENVIRONMENTAL CONDITIONS

V. M. Galushin

Lenin State Pedagogical Institute, Moscow, USSR

The future existence of any group of birds, including the birds of prey, depends on their ability or inability to adapt themselves to the current changes in the surroundings, caused by human activities. Differentiative analysis of this ability is expected to allow estimation of the reasonable extent of anthropogenic impact tolerated by different species of predatory birds. The results of such investigations would provide a basis for the elaboration and implementation of the most efficient strategy for managing the predatory birds' surroundings.

In India more than ten years ago, I happened to observe an unique case of a perfect adaptation of some birds of prey to the urban environment. The city of Delhi harboured at that time as many as 3 thousand pairs of predatory birds within 150 sq. km of its territory, including about 2,400 pairs of black kites, over 400 pairs of lappet-faced vultures, nearly 100 pairs of Egyptian vultures, and odd pairs of other species. The average density of predatory birds in the city was 19.3 breeding pairs per sq. km. The maximum density in some large districts of the Old Town reached an incredible (for birds of prey) figure of 70 pairs per sq. km. An extremely high density of breeding pairs was reported in some settlements in the rural areas of northern India. The well-being of the predatory bird populations in the city of Delhi can chiefly be accounted for by food abundance and - which is of a greater significance - by the Indians traditionally favourable attitude to every living thing.

Peaceful co-existence of man and birds of prey seems to constitute the main feature of life both in the countryside and in urban areas throughout India. It testifies to the ability of these birds to adapt themselves to some destructive forms of anthropogenic influence. It takes them, however, much more time to overcome a deep-rooted fear of man as compared to passerine birds or gulls, for that matter, which did not suffer such persistent victimization. The Indian tradition of a benevolent attitude to every living creature is thousands of years long while tolerance of predatory birds in this country, in particular, dates back from the middle of the 1960s.

There are nevertheless prerequisites for the adaptive faculties of some predatory birds to be revealed, their direct extermination having been drastically reduced and sometimes completely abolished by the current protective measures.

Evidence to this effect has been obtained all over the world, including our country.

In the middle of the 1960s and 1970s we carried out a comparative survey of a region about 150 km east of Moscow using identical techniques. Over ten years, the number of six breeding species of predatory birds increased here from 23.3 to 27.5 pairs per 100 sq. km of woodlands, i.e. by 18% on average. The common buzzard, sparrow-hawk, goshawk, and kestrel were the species that had mostly contributed to this increase.

A similar tendency to an increased or maintained population density of predatory birds has been observed in many other regions in our country; this ground can be covered by specialists who dealt with this problem there. It is important to emphasize, however that this trend is valid chiefly or exclusively in so far as the number of rather common birds are concerned, e.g. the common buzzard, pern, goshawk, sparrow-hawk, hobby falcon, all the harrier species, long-eared and march owls, and sometimes black kite process to be currently underway in many European and North American countries.

There is quite a different and, in fact, situation as regards rare predatory birds - entries to the USSR Red Data Book or the Red Data Books of the Soviet Union Republics. The number of these birds in many regions keep decreasing. In-depth studies of this process and its causes were undertaken in Estonia using the peregrine population as a model. Against this background there are encouraging reports published in the last two or three years on the renewal of some aeries of the peregrine, golden and white-tailed eagles as well as bearded vulture. These are, however, but rare instances.

The differences in the present-day status and trend in the numbers of these groups of predatory birds - rare and rather common - appear to testify to their different response to a variety of anthropogenic factors.

The majority of species can be subdivided roughly into two groups according to their response to a direct destruction by man, which has the most deleterious effect upon the populations. A significant lessening of this influence in the late 1960s and early 1970s brought about a somewhat positive sequel for a number of birds while it failed to affect the others.

The first group embraces many common birds of prey that are known to be perfectly adapted to the limited alterations of the landscape caused by man (common buzzard, pern, hawks, harriers, hobby falcon, and presumably some others). Some of these birds have been shown to distinguish people as safe or dangerous by their appearance or behaviour. This ability is to be regarded as indicative of the adaptive faculty in these birds. Of no small account is the fact that many birds of prey are capable of living under the pressure of the habitual anthropogenic disturbance, but do not sustain its sudden impact. On the whole the species in this group are not expected to be negatively affected by man's presence.

The second group comprises rare species, which are highly susceptible to an impact from any modification of their surroundings. These birds are least of all resistant to human impact.

Many species cannot be classed with group and are supposed to occupy an intermediate position as the data on their status are far from sufficient.

This tentative scheme makes it possible to appraise the prospects for each group of birds and elaborate the appropriate measures for maintaining their optimal living conditions in the future.

The species in the first group are expected to enjoy their adaptive capability to the utmost, provided that the modern legislation protecting all birds of prey from extermination will remain in force for an infinitely long time. Populations of these birds would grow progressively until the ecological capacity of their habitats is saturated. The existence of their viable populations under conditions of rapid socio-economic development does not seem to

require any special governmental measures except for strict enforcement of the legislation on nature conservation and ecological decorum whenever a man gets in touch with Nature.

Survival of the second group of birds is still doubtful unless urgent measures are taken to this effect. Special programmes are needed to prevent their extinction. They should envisage setting up protected areas wherever breeding grounds of rare species are preserved, conserving separate aeries, erecting artificial platforms to support nests, establishing feeding points, and breeding birds in open-air cages to secure an emergency genetic fund and subsequent release of the young birds to revive failing populations. Measures to prevent the mortality of predatory birds caused by pesticides and by stumbling on overhead power transmission lines are of primary importance. Efficient nature protection and conservation are the two main approaches to ensure the existence of birds of the second group.

One should bear in mind that most common species in the first group have been victimized by man for a relatively short span of 100 to 150 years, while the rare species in the second group have been suffering human impact for many centuries. Golden and white-tailed eagles are known to have been killed in Europe from as early as the 16th century on the pretext of their preying on lambs. Nestlings of large falcons have been collected from aeries for the purpose of falconry from time immemorial. Shy individuals avoiding contacts with man appear to have survived in the process of natural selection in populations of this birds.

To sum up, the following conclusions can be drawn from the foregoing. Reasonable transformation of the natural environment does not preclude normal existence of predatory bird populations. As birds are gradually getting the better of their shyness, their adaptive potencies, hampered by all kinds of human destructure activities, are supposed to be revealed making it possible for the populations to adjust themselves to present-day or future levels of anthropogenic influence. Strict enforcement of the current legislation protecting birds of prey and implementation of special programmes for the management of rare species are major prerequisites for this trend to continue.

It can be inferred that measures to be taken to secure optimal conditions for birds of prey are not in conflict with society's socio-economic progress.

We have good reason to consider the last decade and the present moment in particular to be the turning points in the dynamics of the status and numbers of predatory bird populations.

It is up to us to determine whether this favourable trend will continue and how rapidly.

There are still many problems of concern, but we have also good reason to be optimistic, all the more so that I can see a lot of young faces here both among those presenting reports and those listening to them.

I am sure that birds of prey do have genuine friends to take care of their well-being in the future.

SUMMARY

Future of raptors depends on their ability to adapt themselves to environmental changes mostly induced by man. There are extreme examples of both full adaptation of raptors to living in big cities (for instance, about three thousand breeding pairs in Delhi, India) and entire disappearance of some species from great regions. In recent years the most negative forms of man's impact upon raptors, i.e. direct persecution, pesticides, nest destruction etc. are weakened. Therefore a study of such relatively moderate forms as habitat changes, disturbance, influence on food supply and so on becomes important to ensure a stability and increase of their populations.

According to adaptive capability to modified environment, raptors can be divided into two provisional groups: 1) relatively tolerant to man's activity, i.e. common buzzard, honey buzzard, sparrowhawk, goshawk, harriers, hobby and some others; 2) intolerant to man's presence, i.e. most of rare species like eagles, big falcons, vultures, osprey and others. Some species occupy intermediate position (black kite and kestrel in our conditions) or their attitude to a man is unknown.

Species of the first group react positively when persecution and other severe forms of negative influence are abolished. In many regions of the USSR after a legislative act in the middle of sixties their populations became stable or increased slightly. To be fully adapted to a modified environment, raptors of the first group need some measures, mostly local, to soften disturbance of them especially during nesting period.

Raptors belonging to the second group could not exist in a changing environment without a special program of their conservation which includes establishment of permanent or temporary reserves, help in nesting and feeding, strict protection against disturbance and other measures as well as captive breeding for reintroduction of rare raptors to the wild.