Chapter

# The Limit to the Density of Species (A Reflection on Human Intervention in Conservation and Its Effects)

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## Abstract

Human actions on the natural environment cannot always be considered as impacts resulting from their behavior to survive. Many of these activities have caused irreversible damage and changes in the landscape, flora, and fauna. By contrast, several actions, carried out "a priori" with the best intention, to help in the conservation of species considered in danger, have caused a dangerous decompensation. Aid for the recovery of some species of birds has led to their overpopulation. The artificial contributions of food, always in the same places, have caused an excessive increase in the number of griffon vultures (*Gyps fulvus*), which has produced the reduction of other endangered species, such as the black stork (*Ciconia nigra*) and the Bonelli's eagle (*Aquila fasciata*), which have been displaced from the rocks in which they nested due to the harassment of a greater number of vultures. Besides, vultures are attacking domestic livestock at the most defenseless times, such as during calving. Greater flamingo (*Phoenicopterus roseus*) has become out of control in numbers in Europe. The two classic breeding areas, La Camargue (France) and La Laguna de Fuente de Piedra (Spain) have produced an enormous annual number of individuals that are distributed among the few lagoons of Mediterranean Europe. The wetlands are devastated by the flamingo, which removes the mud and prevents sunlight from reaching the underwater vegetation, turning these lagoons into dead water, having to be abandoned (temporarily) by most aquatic species, including the flamingo. The shortage of food resources of natural origin, for such a disproportionate number, has caused the flamingo to invade the rice fields, accepting its grain as a substitute for the invertebrates that it habitually consumed, and which are now scarce. The same is the case with the white stork (*Ciconia ciconia*) in southern Europe. The increase in their population has reduced the number of reptiles and amphibians, bringing several of their species to the brink of extinction. Storks have varied their prey spectrum, consuming carrion, and preying on Montagu's harrier (*Circus pygargus*) brood. In these cases, and many others, the theory of "the more the better" is not valid. If we want to make the protection of some species compatible with the conservation of others, it seems necessary to redirect some situations ...

**Keywords:** density of species, overpopulation, human intervention, conservation effects, species affectation, endangered species

## 1. Introduction

It could be thought, initially, that this chapter will be one more that deals with the impact that certain invasive species cause on the biota of a certain area, region, or country. Not exactly, though too. It is necessary to recognize that this matter - much approached and treated at different levels - still leaves ample room for suggestions and debates. In the text that follows, several examples of intervention in favor of a specific bird species are shown, to increase its populations and "remove" it from a classification "critically endangered" or remarkably close to it.

The measures implemented by different public administrations and/or conservation entities, to try to recover a specific species and avoid its classification as endangered, near endangered, etc., have provoked, and still do, a series of reactions both target species in question, such as related species or prey species; even on those that we would never have believed could be affected by the recovery plans of the former.

Admittedly, some of these reactions were not easy to predict, others were not. In some cases, political or personal "honor" criteria have prevailed, in an apparent maelstrom or race, to have more individuals than another "competing" region or nation.

Also, shortcuts have sometimes been sought. Some original, others of questionable ethics, with reasonable doubts to be protected by scientific criteria.

At times, there has been a sin of precipitation and rapid search for striking results, rather than the application of biological knowledge, and of considering a probable long-term projection.

"A wild population is defined as a set of individuals of a species that inhabits a certain area". "Density is the number of specimens per spatial unit (surface or volume). It is often more useful than the absolute size of the population since density determines and conditions fundamental aspects such as competition for resources" [1].

"Traditionally, indicator species have been considered those that, by being present in a certain system, indicate that said ecosystem is healthy, from the physical, chemical, or biological point of view (or, by the on the contrary, that it is deteriorated, as occurs with the species of aquatic invertebrates that indicate contamination). They are usually species that are easy to detect and "monitor" so that the demographic changes of their populations can be detected in time and interpreted in terms of other variables of conservation interest that are more difficult to measure" [2].

Dedicating all efforts to the recovery of a species, you can avoid the symptoms that warn us of its risk situation, but not end with its origin or, what is worse, camouflage the situation of other less striking species, but in a similar situation. "No species serves to indicate anything about its ecosystem of origin when it is kept in captivity, or conditions of probation, away from enemies and provided with food" [2].

Recovery involves much more than just increasing population numbers. Density can and should have a limit.

These premises constitute the basis on which this chapter will work: The growth in the number of specimens/surface unit of a specific species, which has been "helped" in different ways, is affecting other populations in such a way that it has displaced or eradicated them from specific areas, endangering their existence.

Not all cases of increase in population density in birds are due to human intervention, through the execution of direct intervention measures, to intentionally favor a certain endangered species. However, behind most animal overpopulations - not just birds - are human actions that, consciously or unconsciously, have caused them.

The examples discussed below refer to situations that occurred in Spain. We know of multiple similar actions in other countries. The reader will be able to relate and apply each case to its environment but will agree with us that a limit to the density of the species is necessary.

## 2. The case of ...

### 2.1 The griffon vulture (*Gyps fulvus*)

Traditionally, raptors have been considered "harmful" in a simplistic dichotomous classification, in contrast to "beneficial birds." The diurnal raptors have been especially "persecuted", for predating on rabbits (*Oryctolagus cuniculus),* red-legged partridges (*Alectoris rufa*), and other species, which man uses for his consumption.

Birds of prey were considered protected species, in Spain, from the year 1973. However, their habitats were not protected until several years later. It could be the paradox that an imperial eagle (*Aquila adalberti*) would fly over the entire Spanish territory without risk of being shot, but, incoherently, it would starve because its habitat had been destroyed, it did not have preys, or it could not rest safely or reproduce, because there are no trees on which to build the nest.

The custom of poisoning carrion and eggs did not cease with the law. Raptors continued to perish due to the "silent" effect of strychnine, a situation that also affected corvids. The secondary poisoning of scavenger birds occurred by ingesting the corpses of mammals considered vermin, such as foxes, which had been poisoned, or even wild boars, which had eaten the deadly bait intended for foxes.

There was another important decrease in the populations of griffon vultures due to the use of the tractor in agriculture, because it marked the end of the use of animals to plow and harvest agricultural fields: animals that were a basic contribution to their subsistence.

Traditionally, the corpses of domestic cattle were abandoned in the field, in the same place where they died (in the case of extensive livestock) or transferred to a point away from the facilities if they were housed animals.

In the case of the herds in the extensive regime, the location of the corpses depended completely on chance, so the ethological patterns of the search flights of the vultures did not suffer alterations.

The European Union, with the emergence of the bovine disease, called spongiform encephalopathy, which is transmissible to humans, issued regulations that prohibited these practices, making it mandatory to hire incineration services for carcasses. Suddenly, the most important source of food for scavengers was eliminated, which from then on only had carcasses from hunting. In some localities, points of deposit of carcasses of cattle were authorized, in which the animals were eviscerated (being buried or incinerated these carcasses).

During that time, vultures attacked disadvantaged animals, such as during parturition, tearing of genitalia and killing the calf or lamb [5]. Situations that, until then, had been exceptional, but continues occurring on more frequent occasions today (**Figure 1**). As a contrast [3–5], as follows: "A sheep of my property died in childbirth, I dragged it to a clearing where the vultures could see it better, they fell on it and almost ate it completely but they did not touch the corpse of the dead lamb as well and cause the sheep to die. It is the case of a dead animal" [4] and "A cow disappeared from a farm in Portezuelo, a town very close to Acehúche. It was found almost eaten by vultures and suddenly we saw something moves on the corpse; it was a calf that had not been touched and left ahead. In this case they were able to attack the mother even before she was dead, but we are not sure" [4].

**Figure 1.**
*Vultures on the prowl. Sheep in a protective attitude towards lambs. Photo M. Calderón.*

To alleviate the decrease in food in the field, many public and private initiatives (NGO's) were carried out, consisting of preparing fixed feeding points for scavengers. The contributions of remains were made, in general, with constant periodicity (**Figure 2**).

In 2011, the EU standard was transposed into Spanish legislation, once again authorizing the abandonment of carcasses in the field, after the pertinent analyzes.

In an area of the La Serena region (Badajoz), at the end of the last century, there were 150 breeding pairs of griffon vultures. In 2020 the census was of more than 400 couples. There are no feeders for vultures there, but the extensive sheep herd

**Figure 2.**
*To alleviate the decrease of food in the field,fixed feeding points for scavengers were prepared. Photo M. Calderón.*

has increased enormously, from the moment that EU aid began to be paid per head of cattle and not per farm, as was done previously [3].

The attention and care of these sheep have decreased a lot or is almost non-existent. The death of several heads does not seem to worry the farmer, always compensated by the EU subsidy. The vultures, logically, take advantage of the corpses and increase their number of reproductive pairs.

Species such as the griffon vulture increase their population density, constituting new breeding colonies, while other birds of prey, as important as they, decrease in number due to the pressure of the vultures when competing for nesting platforms on the rocks.

Griffon vultures, in certain areas, are seriously compromising the viability and existence of several species of raptors and other gliders, which exist in much smaller numbers of population and are truly vulnerable or are vulnerable or in danger, such as the golden eagle (*Aquila chrysaëtos*), the Bonelli's eagle (*Aquila fasciata)* and the black stork (*Ciconia nigra)* [3, 4].

At the end of the 20th century, in the rocky areas of Hornachos (Badajoz) or any other area in the area, a golden eagle could expel three pairs of griffon vultures from a ledge to install their nest there. At present, the highest platforms and ledges, the best ones, are occupied by griffon vultures aided by the much higher number of specimens, can displace the eagle and forcing it to live in less secure rocks, and even, not to breed [3].

This situation has been repeated with Bonelli's eagle, forced by the pressure of the vultures to abandon the rocky cuttings of Cabeza del Buey (Badajoz). Only a single nest remains, at low height, far from its usual rocky platform, with a high risk of attack by predators, and located between two recent colonies of vultures that, in a very few years, will force it to leave the area permanently (**Figure 3**) [3].

Vultures perch on the same rocky platform where black stork's nest is located, and some vultures have been observed aggressively stretching their necks against the black stork in its nest [3].

Egyptian vulture *(Neophron percnopterus)* has been definitively expelled from the Sierra de las Cabras, at La Serena (Badajoz) [3].

In the Monfragüe National Park (Serradilla, Jaraicejo, Malpartida de Plasencia, Serrejón, Toril and Torrejón el Rubio, Cáceres province), the problem with

**Figure 3.**
*Bonelli's eagle adult and chick in the nest. Photo M. Calderón.*

**Figure 4.**
*Griffon vulture on black vulture nest after expelling the owners. Photo A. Rodríguez Martín.*

reference to the griffon vulture has similarities with what happened in the La Serena region, mentioned above.

At the end of the last century, the population of griffon vultures in Monfragüe was about 250 breeding pairs, which nested on the numerous cliffs on the banks of the Tagus and Tiétar rivers that cross the national park, and on the steep slopes of its mountains. In 2020, the census of breeding pairs of griffon vultures was 700 and 350 of black vulture (*Aegypius monachus*) [4].

In recent years, griffon vultures have expelled exactly 75 pairs of black vultures (*Aegypius monachus*) from their nests and have occupied them with their spawn. Black vulture pairs have been displaced from their platforms (tree nests) by the pressure exerted by the high number of griffon vulture pairs (**Figure 4**) [4].

The black vulture is a species classified as vulnerable due to its low population. The griffon vulture is not included in the catalog, because it is a species without conservation problems.

The griffon vultures of the Monfragüe National Park have traditionally been feeding on the carcasses of deer, wild boar, and domestic cattle, existing in the farms adjacent to the park, maintaining a population with a little upward trend. In recent years, their number has increased, due to the greater availability of food. Two farms, located in the nearby village of Acehuche, and some others arround, deposit the corpses of pigs and chickens that die in their facilities, in landfills set up for this purpose (**Figure 5**).

In addition to the "upheaval" in the griffon vulture population, caused by these permanent contributions, another ghoulish species has changed its wintering quarters, conditioned by the food source. It is the egyptian vulture that gathers an important nucleus of wintering individuals: between 125 and 140 specimens. For the egyptian vulture to nest in the park, it has been necessary to intervene by adopting some ledges and caves (reducing the entrance hole), to prevent the vultures from also displacing them from their nests. The conditioning of Egyptian vulture nests so that the griffons cannot enter, or at least it is more difficult for them, has been carried out throughout Extremadura [4].

Black stork is pressured by griffon vultures in other places. An example: a black stork nest located on a pine tree, which had been used annually since 1977. In 1990 it moved and built a new nest on a rock, next to the Alcántara water reservoir. There


**Figure 5.**
*Farmers deposit the corpses of pigs and chickens that die in their facilities, in landfills set up for this purpose. Photo A. Rodríguez Martín.*

it raised 4–5 years until a couple of vultures occupied the nest and was breeding in it for years. The pair of black storks did not reproduce for 4 years. In the fifth year they settled on a pine tree where they stayed for a few years. Again it goes to another rock near the reservoir, surrounded by breeding griffon vultures, it was successful for another 4–5 years and in the end it was also displaced by griffons, this has happened 3 years ago and we have not located the nest of this couple or their descendants [4].

In this case, the difference in the breeding season gives an advantage to the vultures that begin to reproduce in January, while black storks do not return to Spain, from Africa, until the middle of March (**Figure 6**).

There are 7 pairs of Bonelli's eagle in the Monfragüe area. Four of them reproduce on trees. Problems with Bonelli's eagle nests due to its occupation by griffon vultures have occurred frequently in Extremadura, especially those found in the rocks. In Monfragüe, in particular, there was an even more striking case because a

**Figure 6.**
*Vultures begin to build their new nests in January. Photo M. Calderón.*

**Figure 7.**
*Vulture fight. Photo M. Calderón.*

Bonelli's nest installed in a cork oak, tucked between the branches where it seemed that the vultures could not reach, but the nest was occupied by vultures [4].

The density of the vulture population in Spain already seems excessive. The SEO/Birdlife Census of the year 2018 [6], calculates in more than 100,000 specimens This number has been reached by the creation of feeders for scavengers. There is not so much carrion in the field to feed such a population. If it were not for the artificial help of the feeders, the population would maintain numbers more in line with the natural availability of food and its behavior would not have been stamped, dedicating itself to waiting for daily or weekly food, without search effort or natural selection of specimens for playback.

It is common, from what has been observed, that initiatives to support a specific animal species have a beginning, but not an end. We think it should not be so complicated to close the project and start a new one to help a different species. A rethinking of the role of artificial feeders is necessary. The negative impact on other endangered birds is being caused, now, by the same vultures that are being helped, due to lack of control of their density and the unlimited growth of their populations (**Figure 7**).

The times of hunting and dispersing poisons, which seriously harmed scavengers, are over (with a few sneaky exceptions). The logic of redirection and modification of permanent aid measures is imposed on griffon vulture populations, with control and limit to their density, based on calculations of space availability, and minimization of interference with other species of raptors. The policy of the more the better should not be continued.

The vultures have become artificially fed "urban park pigeons". Not so harmless, because they no longer fear the human.

## 2.2 The case of the greater flamingo

The greater flamingo (*Phoenicopterus roseus*), which nests in various colonies around the Mediterranean on the NW Africa, has increased its population a lot, thanks to the actions carried out in the two largest colonies in the area: La Camargue (France) and the Laguna de Fuente de Piedra (Málaga, Spain), and which have led to the expansion of the species and the creation of breeding colonies in Delta del Ebro, Castilla-La Mancha, and Alicante.

With the perspective that elapsed time gives, it is easy to judge the actions carried out years ago, undoubtedly done with the best intention because then, it was impossible to foresee the development of the events and the impacts caused.

In the Camargue (France), techniques of attraction and habitat management were used to secure the colony of flamingos that, for decades, had visited the Rhone delta and installed their colonies annually, with variable success. Among other measures, an island was built specifically designed for the installation of a large breeding colony, carrying out steps to achieve its settlement, such as the preparation of hundreds of mud cones, imitating the beginnings of nests, distributed throughout the artificial island, which it was a claim accepted by the birds [7, 8].

In Fuente de Piedra, [9] *quotes verbatim*: "According to [10] this species was not particularly abundant in the past in this area, and the management measures aimed at promoting its breeding in Fuente de Piedra [11] the disappearance of nearby wetlands that they formerly used, such as the Lantejuela lagoon [12] and the creation of the extensive fish farming farm at Veta la Palma, have been able to contribute to the increase in population. of flamingos from Fuente de Piedra and their presence in the Doñana National Park. ICONA bought the lagoon ...

The specific objective of the Fuente de Piedra nature reserve was the increase in the flamingo population [13, 14] "something unprecedented and probably unthinkable in the case of much more threatened species (but not so big and pretty)" [15].

They followed in the footsteps of La Camargue, conducting, creating and adapting the island of Senra and making and installing a certain amount of clay cones to attract flamingos.

The flamingos of the Fuente de Piedra colony have no sufficient food resources, neither in the lagoon nor in the surroundings. They must make a flight of about 350 km (round trip) to the marshes, rice fields and lagoons of Doñana, to meet their needs and bring food to their chickens. These flights are performed at night [16].

"Since the 1960s, the density of flamingos has doubled in Spanish wetlands due to the combination of species management (including measures to ensure nesting, more frequently than would be natural for this species) and destruction of many wetlands outside the breeding season. The destruction of submerged macrophyte grasslands harms ducks and coots" [15] (**Figure 8**).

**Figure 8.**
*The density of flamingos has doubled in Spanish wetlands. Photo A. Amor.*

"Since the eighties of the last century, monitoring and management of the species have been carried out in our country, which has contributed to reproductive success and, therefore, to a notable increase in the population" [17]. Breeding colonies were started in Doñana, Marismas del Odiel, Delta del Ebro and in some lagoons in Albacete and La Mancha.

In the Mediterranean biome, because of climate change and desiccation caused by human action, there is a significant reduction in the surface of wetlands and the duration of their hydroperiod "This fact, together with conservation policies and exploitation by flamingos from alternative artificial habitats such as rice fields or aquaculture ponds, has caused an increase in flamingo populations in the south of the Iberian Peninsula [18]. The traditional resources of the flamingo (*Daphnia sp*. and other small aquatic invertebrates) are insufficient. The flamingo has explored and found in rice, a magnificent new source of nutrients.

"In the case of the greater flamingo, their way of feeding, trampling, and stirring water and sediments, produces changes in the turbidity and distribution of

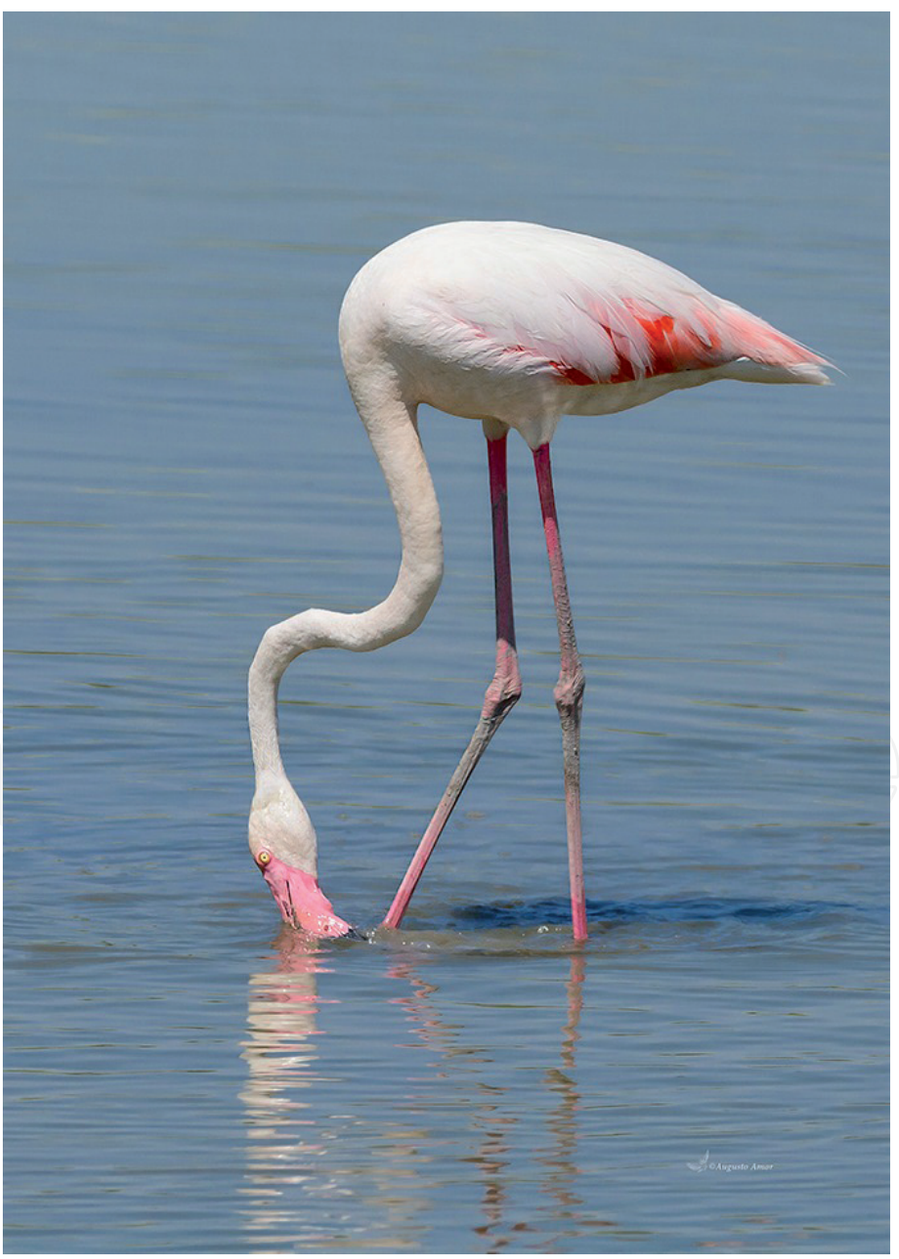

**Figure 9.**
*Flamingo's way of feeding, trampling, and stirring water and sediments, produces changes in the turbidity of the water. Photo A. Amor.*

nutrients [19] and reduces the cover of submerged plants, promoting a change of waters clear (dominated by submerged macrophytes) to cloudy waters (dominated by phytoplankton) [20]). Therefore, an increase in the density of flamingos or geese can cause (rather than indicate) major changes in wetlands (**Figure 9**) [15].

In 2020, 6,030 young were born in the colony of greater flamingos in the Fuente de Piedra lagoon, with a total of more than 10,000 reproducers. "Between the years 1984 to 2019 the flamingos have bred in 28 seasons and have not, due to insufficient rainfall, in eight. In that time, 388,046 breeding pairs have been established in the lagoon and 221,157 young have been born [21].

It seems clear that we do not have lagoons for all the flamingos that are born every year, not in Spain, but any of the Mediterranean coastal countries.

The increase in the flamingo population in Spain could harm, among many other aquatic birds, to marbled duck (*Marmaronetta angustirostris*), a critically endangered duck. As they coincide in a good part of its distribution area in Spain, the flamingo, "kicking" and stirring the funds to filter its food, produces the reduction of the "meadow" of submerged plants, which is the area where marbled ducks feed [10, 12, 22, 23].

"Besides, due to the particular way the flamingo feeds, it can mobilize the pathogenic bacteria found in the sediments while carrying out this activity, being able to promote the appearance of epidemics suffered by the marbled ducks and other aquatic birds in El Hondo in the last years." [23]. El Hondo is a reservoir located in the province of Alicante, close to the Mediterranean coast, 400 km to the east of Fuente de Piedra, which is used by flamingos as a wintering area, with censuses close to 2000 specimens.

In the Spanish region of Castilla-La Mancha, located in the center of the peninsula, the presence of flamingos in its network of endorheic lagoons has been testimonial until recent times (**Figure 10**).

The runaway increase in population density has led the flamenco to disperse through other lagoons in the center, taking with them environmental problems and deteriorating the already poor quality of its waters.

According to the calculations of the NGO Ecologistas en Acción, a total of 9,000 flamingos are distributed by the lagoons of Castilla-La Mancha. "It is a species that can alter lagoons, destroying submerged plant communities. They are altering the monitoring of the lagoons and the plant communities". "They destroy aquatic vegetation ..." [24].

**Figure 10.**
*Flamingos starting a new colony in the Manjavacas lagoon in Central Spain. Photo J. Porrero.*

Its presence was relatively scarce until the end of the nineties, with colonies in the Pétrola lagoon, in the province of Albacete. In 2010, a breeding colony was installed in the Manjavacas lagoon (Cuenca), with a total of 2,500 adult specimens that produced 450 young.

According to [25]: "Physical alterations are evident in the case of the greater flamingo which is one of its forms of feeding behavior, leaves obvious craters of approximately one meter in diameter at the bottom of the wetlands it occupies. This modification of the sediment topography, in addition to hydrological changes, can affect aquatic vegetation ..." (**Figure 11**).

An important opinion indicates [15]: "the density of flamingos has doubled several times in Spanish wetlands, due to the combination of species management (including measures to ensure nesting more frequently than would be natural for this species) and the destruction of many wetlands used outside the breeding season. The destruction of submerged macrophyte meadows by flamingoes, harms ducks, coots (*Fulica atra, F. cristata*) and other birds that depend on them, but may favor waders that prefer to feed in open water areas [12]. In part, this could explain the positive correlation between the abundance of flamingos and waders".

The increase in the density of the greater flamingo in Spain, and the Mediterranean area, is higher than what has been announced. The destruction of lagoons by the excessive number of flamingos is an indisputable fact, but it goes unnoticed. The turbidity of the waters after the flamingo flocks' search for food is something that cannot be seen from the shores.

The case of the flamingo is another example of management, in favor of a species, that has overflowed, causing enormous damage to especially fragile ecosystems such as wetlands.

It has never been a real endangered species. The interconnection between the Mediterranean and Northwest African colonies has been ensuring their survival and causing their overpopulation. This is another wrong case of "the more the merrier". Intervention is essential to limit the population of this species and to do it very soon.

**Figure 11.**
*Flamingos leave obvious craters of approximately one meter in diameter at the bottom of the wetlands it occupies. Photo J. Porrero.*

### 2.3 The case of the white stork

The white stork population in Spain decreased notably in the second third of the 20th century, after the closure of landfills in small rural towns, the centralization of waste treatment at the county level and, most likely, due to the increased use of Organochlorine insecticides such as DDT, which decreased the number of invertebrates in the field and could affect the fertility of storks.

The 1984 census of nesting pairs was 6,753 nests, with a decrease of 8% concerning the 1974 census and 47% regarding the 1957 census [26, 27]. Starting in 1984, the population grew again at a good pace, reaching the figure of 16,643 in the 1994 census, which meant a percentage increase of 146% [28]. There was a new increase in the 2004 census, reaching 33,217 breeding pairs: population growth of 100% (**Figure 12**) [29].

The changes produced in agricultural land, the use of insecticides and herbicides, the intensification of crops, the disappearance of puddles and small wetlands, have caused a change in the behavior of storks, at least in the province of Badajoz, both in their methods and places of hunting as in the specific object of their diet [3, 5].

There is an increase in the density of the white stork population in the province of Badajoz, coinciding with the figures from the censuses. A large part of that population no longer migrates. It remains in its breeding territories all year round. Winters are milder, due to climate change, and you have food

**Figure 12.**
*Stork chicks just fed by the adult. Photo. M. Calderón.*

**Figure 13.**
*A decade ago this would be a flock of premigratory storks, now it is a pre-wintering flock. Photo M. Calderón.*

resources at your fingertips, so you neither need nor compensate for migration to Africa (**Figure 13**) [3, 5].

The white stork hunting system is solitary during the breeding season. During the migratory season, and in winter, in their African territories, the group hunt in line, beating fields in search of prey [30].

As many specimens remain in Extremadura during the winter, without migrating, they use the same hunting technique as in Africa. In the La Serena area, it is common to observe, in recent years, groups of 40–60 storks in a line, advancing in unison, capturing any animal that moves in their path.

This hunting system - it is being observed - they have begun to use it also in the breeding season. In previous years, storks hunted in cereal crops, until the plants reached a height like their tarsi, not returning till after harvest.

Currently, they have been observed hunting, among wheat or barley plantations that exceed their height, to the point that they already dare to prey on Montagu's harrier young which they capture directly in the nests of this raptor located on the ground [3]. It is another proof of the stork's change in feeding strategy. Previously, it had been observed preying on the nests of smaller birds, such as the lark (*Alauda arvensis)* and, exceptionally, house sparrow adults (*Passer domesticus/hispaniolensis*) that install their nests in the vicinity of the white stork nests [5].

These new predatory behaviors may be due to the scarcity of common prey (Orthoptera, Coleoptera, amphibians and reptiles), being forced to increase the spectrum of prey.

The increase in the density of storks in Extremadura, due to various causes in which man has always intervened, has caused an ecological problem of great importance but truly little visible: it is the enormous decrease in amphibians and reptiles, even when they keep in the small ponds in which the first ones reproduce. The constant predatory pressure of white storks on amphibians in humid areas, which are rare in the region, has led to the virtual extinction of these groups, with no specimens being observed or heard in areas where, until about 7 or 8 years ago, were relatively abundant (**Figure 14**).

As an example, a case followed in detail: This is a section of the Ortigas river as it passes through the municipality of La Guarda (Badajoz).

**Figure 14.**
*Stork hunting alone. Photo M. Calderón.*

Until 2012, there was a variable number in that stretch of the river, 9 stork nests in the trees of the river and 3–5 on the roof of the village church. In spring and summer, the nocturnal songs of toads, toads and frogs were heard, according to their different periods. In 2014 another colony of storks was installed with 8 new nests. Since that year, the silence of the amphibians is permanent.

A quick and reliable way of dating the abundance of reptiles and amphibians in that area was to travel a 6 km stretch of the road that connects the town of La Guarda with Campanario (10 km.), With little traffic of vehicles during the day, and width of 5 m, noting the snakes run over and those that cross from one side to the other (*Malpolon monspesulanus, Zamenis scalaris*). Upon return, several stops were made to observe, at different preset stations, the density of ocellated lizards (*Timon lepidus*.) in the rocky areas near the road [31].

The same road can serve as a measurement and sampling unit for the density calculations of some amphibians (*Epidalea calamita, Pelobates cultripes).* To do this, a night in April had to be chosen, after a rainy day. The transit of amphibians between small ponds, in search of a mate, reached such densities that, in some sections, it was impossible to continue driving, being necessary to travel the road on foot, so as not to kill dozens of amphibians by crushing [31]. Some data for the years 1973–1990 reached 3 snakes/km and 20 amphibians/km, with some concentration points of 78 amphibians/100 m.

At present, with a somewhat higher frequency of passage of cars, the finding of a snake run over is anecdotal, and the passage of amphibians is imperceptible or non-existent.

The trophic chain must be conserved based on the proportional balance between the species that make it up. An increase in predators means a decrease in prey. When the number of predators is excessive, the usual prey disappears, being replaced by others that are not prepared for the new threat, entering a disadvantage. In the case of the white stork, its predation, in such high numbers, is causing the disappearance of amphibians and reptiles in surrounding areas.

This situation could be extrapolated to the rest of the Spanish territory. There is a lack of studies that quantify it, urgently, so as not to be too late, as usual ...

**Figure 15.**
*Cattle heron on a sheep. Photo F. del Río.*

### 2.4 The case of the cattle heron on the Island of Lanzarote (Las Palmas Province, Canary Islands, Spain)

Cattle heron (*Bubulcus ibis*) makes migratory movements from Africa to spend the winter in the Canary Islands, due to the lack of food at that time in Africa, returning to the continent to reproduce.

Accidentally a wounded specimen could be cared for by a human and attracted a couple, getting to reproduce on the island of Lanzarote and starting a breeding colony on the island, which reaches 1,500 individuals (**Figure 15**).

This population, that nest in the city of Arrecife, the island's capital, is seriously endangering the conservation of endemic reptile species, which they capture as the basis of their diet. The authorities do not solve the problem firmly. They are allowing the disappearance of reptiles and causing damage to other species of birds on the island (**Figure 15**).

An island is a very sensitive ecosystem. Not acting is irresponsible [32].

### 2.5 The case of the northern raven on the Island of Fuerteventura (Las Palmas province, Canary Islands, Spain)

The population of northern raven (*Corvus corax canariensis),* an endemic subspecies of the Canary Islands, "reaches 1,300 specimens, according to the General Directorate of the Environment of the Canary Government, which rejects that they cause significant damage to livestock" (**Figure 16**).

"According to the study carried out in these four years by the General Directorate for the Fight against Climate Change and the Environment of the Government of the Canary Islands on the population of crows in Fuerteventura and the control of the damages produced in the field and livestock, the number of

**Figure 16.**
*The northern raven (canary race) has reached overpopulation on the island of Fuerteventura. Photo F. del Río.*

specimens would be around 1,300 with a density fluctuation between 0.81 and 0.96 individuals per square kilometer. In terms of damage, only six incidents per year have been reported in a total of 163 livestock farms, which indicates a 'very limited' incidence [33].

The incidence of ravens, "not so limited", occurs on endemic populations of reptiles, which are experiencing such loss of numbers that their survival is in danger. It is urgently necessary to establish limits to the density of the raven population [32].

Ornithologists residing on the island indicate that the increase in the density of this species has its origin in the contributions of farm animal remains, which are carried out weekly at two specific points on the island. The productivity of the breeding pairs of crows is currently maximum (4–5 chicks per nest). The high number of specimens, causes them to no longer find places to install their nests, even building them at an exceptionally low height, on fig trees. They warn of the impact they are causing on endemic reptile populations, seriously compromising their continuity [32].

The contribution of food by man has produced the desired effect, in its day, which was to increase the population of this subspecies of raven. However, a limit to its density has not been established. Once the recovery program has started, it has not been marked where to stop. If now the weekly contributions to the dumps were stopped abruptly, the ravens would have a much greater impact on their captures of reptiles, reaching a certain extinction. It seems urgent and essential, a biological control of the raven, to establish a number, in order to allow to maintain the subspecies and, at the same time and level, the endemic reptiles of the island.

In none of the above cases can the "the more the better" be validated.

There is no shortage of examples of very worrying situations, which reach this qualification due to the inaction of governments and "animalistic" civil society, which treats and grants animals the same rights as humans, and even more¨:

The case of "escapes" from private collections and zoos; the case of the release of pets, by individuals; the case of domestic and feral cats; the case of ... so many cases ...

## 3. Conclusion

"We are surrounded" is a phrase that indicates the imminent of losing a battle.

The fever of a new fondness for nature and the trafficking of exotic species, leads to conservationism and the authorities, to inaction in situations caused by alien populations of animals that have been introduced into the natural environment, intentionally (as experiments), by escapes from captivity or liberations due to thought and militancy, such as the American mink, in Europe.

We wish this epilogue is not the last cry for help in favor of various species, endangered by well-intentioned human actions, that have not foreseen the "collateral damage", or yes, in programs or actions for the recovery or reinforcement of populations animals, and that they do not seem to present a clear reading of the problems caused, nor do they seem to set limits to the density of the species.

Any project, or monospecific conservation program, must consider the effects that it may cause to other populations, set temporary limits, in the short term, in which the impact caused to other species is reviewed, and the performances reduced or suspended.

As humans, we have intervened and altered so many balances and ecosystems that we have a responsibility to mitigate the damage caused. 150 species are going extinct every day. We have lost forever, thousands of species without having come to know them. This is sad and irresponsible. It would be sadder, still, to allow those that we already know to be lost and not get to know those that remain to be discovered.

We have a lot of work to do. We have a lot of problems. We are surrounded ...

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