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# The importance of Wildlife Rehabilitation Center in the conservation of wild species

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# Abstract

Wildlife rehabilitation centres have an important role in the conservation and rehabilitation of species. Regardless of the large numbers of wildlife casualties rehabilitated every year all around the world, there are few published data detailing species, numbers treated, quality of care provided and outcome following release. Wildlife can act as sentinels of

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#### Introduction

Wildlife rehabilitation, according to the International Wildlife Rehabilitation Council (IWRC), is defined as "the treatment and temporary care of injured, diseased and displaced indigenous animals and the subsequent release of healthy animals to appropriate habitats in the wild" <sup>[1, 2]</sup>.

policy.

Wildlife Recovery Centres (WRC) are widespread worldwide [3-7]. These institutions vary from large, modern and wellequipped centres with highly qualified paid staff to small organizations with little equipment and run by volunteers with limited resources, depending on many factors <sup>[8]</sup>. They can be managed by public or private entities, that conduct their work in close contact with the local administrations <sup>[9]</sup>.

One of the reasons why WRC exist is to attempt to offset the negative impact of man on species demographics and individual animal welfare <sup>[1]</sup>. Species all around the world are declining due to anthropogenic factors such as pollution, hunting, habitat destruction, poisoning, and others <sup>[10–12]</sup>. For example in the WRC in the United Kingdom and the Netherlands, 40% of the hedgehog's admittance was provoked by road traffic collisions, garden and pet injuries, poisoning, and disturbance of habitat (Figure 1)<sup>[13]</sup>. In the UK cats kill 90 million "prey items" (e.g., small birds, rodents, lizards) during the spring and summer months<sup>[14]</sup>. This moral and ethical responsibility is even more significant in large man-made catastrophes such as oil spills<sup>[15]</sup>.

Fig 1: a) orphan owl; 2) orphan squirrels; 3) injured fox due to collision with a vehicle







ecosystem health, and the data collected can provide

important information not only regarding the diseases in

their populations but also in Humans. This article reviews

the importance of wildlife rehabilitation and its role in

wildlife conservation and offers recommendations on future

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The majority of the rehabilitation work is conducted with common species that have secure populations in their regions. The variety of the species will vary according to the region <sup>[16]</sup>. Some species that are admitted to the WRC have legal protection, such as threatened and endangered species (that are very few individuals to their rarety), whereas others are classed as a nuisance or invasive species (usually eliminated by law) <sup>[17]</sup>.

When animals are admitted to the WRC, injured, orphaned or sick, is necessary a triage by specialized personnel

(veterinarian) to prioritize patients that are in the worst condition. The objective is to treat as many animals as possible with limited resources for all to be treated immediately. Overall, the process of dealing with a wildlife casualty can be divided into six main stages: 1) Initial location or sighting, capture and translocation to the WRC; 2) Examination, assessment for rehabilitation or euthanasia; 3) First aid and stabilization; 4) Treatment. 5) Recuperation and rehabilitation; 6) Release or euthanasia (Figure 2) <sup>[18]</sup>.



Fig 2: Capture, treatment, rehabilitation and release of different species in wildlife rehabilitation centres

#### **Disease surveillance**

Wild animals can be considered biological indicators of environmental health, particularly in urban and suburban areas <sup>[9]</sup>.

The wildlife casualty usually is not an isolated entity, but part of a complex ecosystem that incorporates the individual, other members of the population, other wildlife, domestic animals and humans <sup>[19]</sup>. This conceptual model embraces the 'One Health' principles of integrating human, animal and environmental health (Figure 3) <sup>[1]</sup>.



Fig 3: One Health concept adapted to wildlife

Around 75% of emerging human diseases originate from wild animals, while 77% of livestock and 91% of domestic animal pathogens also infect wildlife species <sup>[20]</sup>.

The abundance of animals that are admitted annually to rehabilitation centres provides can provide a unique opportunity to conduct investigations on pathogens that may be important to the health of not only wildlife species but also domestic animals and humans <sup>[20]</sup>.

WRC records are an often unexploited source of crucial information on species morbidity and mortality in urban and suburban areas <sup>[8]</sup>. The data collected on wildlife mortality and morbidity can be used in wildlife conservation projects, reintroduction, translocation programmes and disease surveillance.

The information obtained through the systematic collection by WRC can be provided to national wildlife disease networks and governments (e.g., Wildlife Disease Association (WDA), European Wildlife Disease Association (EWDA), World Organisation for Animal Health (OIE)) and help in the vigilance of diseases. During the West and Nile epidemics in North, America WRC provided important data <sup>[8, 20]</sup>. A single description of an unknown disease may lead to the identification of novel pathogens not previously described in that host <sup>[1]</sup>. Little is still known about the transmission, pathogenicity, or natural history of many diseases that affect wild animals. Animals admitted for rehabilitation can provide information regarding various pathogens and increase our knowledge. These data can then be later used to minimize morbidity and mortality caused by these pathogens both in free-ranging and captive animals <sup>[20]</sup>. Besides, this opportunistic and inexpensive method of data collection can provide more thorough epidemiological studies <sup>[8]</sup>.

#### Release of animals from the Wildlife Release Centre

The main objective of WTC, when possible, is to recover the animals, rehabilitate them and released them back to their natural habitat. The release of the animals is a very complex and important process, that can be an underestimated component of the rehabilitation process with the potential for high losses <sup>[18, 20]</sup>.

The data relating to release rates from wildlife centres is very limited since, for example, the British Wildlife Rehabilitation Council suggested that around 42% of all admissions were eventually released <sup>[1]</sup>. The data available data show that the release rates are overall higher for birds and young animals <sup>[18]</sup>.

When animals are released their need to re-integrate into the wild, acquiring again their natural behavior and breeding habits, for the release to be considered successful. In the cases where is necessary to translocate animals, there is a potentially negative genetic, pathogenic and ecological effects <sup>[21, 22]</sup>.

To improve the success of release and reintegration on the habitat some measures can be accomplished by the WRC such as 1) reducing human contact and "imprinting" in juveniles; 2) providing physical fitness because most animals lose weight after release; 3) provision of naturally occurring foods in captivity before release; 4) in birds fly training  $^{[1, 23]}$ .

Post-release monitoring is crucial to evaluate the success of the release process, something that many times is not accomplished. This monitoring can be accomplished by: 1) direct observation with recognition of individual animals using rings, tags, fur clips, coloured dyes or tattoos; 2) movement-sensitive cameras; 3) permanent marking by radio frequency identification (RFID) transponders or passive integrated transponders (PIT tags) placed as subcutaneous chips or ear tags <sup>[18, 24]</sup>. The studies of postrelease outcomes can contribute to decisions regarding when and how to release casualties. For example, in foxes, the initial provision of shelter and support feeding in a temporary enclosure within the release site has been shown to improve post-release survival in captive-reared animals <sup>[25, 26]</sup>.

## Limitations of the Wildlife Rehabilitation Centers

The information obtained from statistical analysis of WRC databases is important to the successful management of the institution but also for wildlife disease monitoring programs, wildlife medicine and ecosystem health assessment <sup>[8]</sup>. The data collected in a single rescue centre does not give us information regarding the national level, and sometimes the comparison between centres can be difficult due to the use of different methods to store the data <sup>[1, 8]</sup>.

WRC has limitations, as referred before, some centres are very small and have very limited resources and access to complementary exams. Regarding the databases from WRC, there is an important source of information, but also they are limited and biased. The data is considered non-random and biased due to: 1) some species may be more represented due to public perceptions or sentiments (ex. Hedgehogs); 2) species that live near or within urban, suburban areas are more commonly admitted; 3)anthropogenic causes are overestimated; 4) natural deaths of wild animals remain undetected because there are not admitted to WRC; 5) injuries that cause rapid death generally are not included data; 6)databases tend to be more incident focused (e.g. orphaned, trauma by run over) rather than being diagnostically orientated; 7) different volunteers recording data into the database is a higher possibility of recording errors<sup>[8]</sup>.

However, this limitation can be eliminated or reduced by standardization of record keeping, health screening (e.g., ancillary diagnostic tests, regular *postmortem* examination), and the use of common codes and categories in all WRC<sup>[8, 27]</sup>.

#### **Education role of the Wildlife Rehabilitation Centres**

Almost all the WRC have an educational component to their activities, they can use their clinical cases and experiences to educate the public about the value of wildlife, how to recognise injured animals, how to act in the presence of animal animals and the importance of healthy ecosystems [17].

## When wild animals are found what to due

When someone encounters a wild animal, first it is necessary to determine if it needs human help. If the animal presents a clear injury (e.g., as a broken bone, blood, cut), if the animal is shivering, it is a young bird without feathers, or if the animal is brought home by a pet (cat or dog), are all signs that the animal needs help and should be transported to a WRC.

In the eventuality of finding mammals and birds babies alone, the decision tree to follow is represented in Figures 4 and 5.



Fig 4: Decision tree of how to act when finding a baby bird alone



Fig 5: Decision tree of how to act when finding a baby mammal alone

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Wild animals should be approached very carefully. Deer, seal, wild boar, otter, badger, fox, snake, bird of prey and nocturnal, swan, goose, heron, and gull should be approached with special precaution. Keep a safe distance and call the responsible authorities to collect the animals. If it is not possible for the recurs to come to collect the animal some steps should be followed to ensure the security of the person and the animal. Before approaching the injured animal weigh up the risks, and only approach when there is no risk to yourself or others. When capturing the animal keep him away from the face to avoid bites or scratches. When possible use gloves or a towel to handle the animals, in special those animals that can transmit diseases such as rabies, and wash your hands after touching the animals. The animals should be placed in a cardboard box or carried covered by a towel to maintain a dark environment and make as little noise as possible in the vicinity of the animal [1, 18]

## Conclusion

WRC are a key to the conservation and preservation of wild animals, and a source of information regarding the outbreak of new diseases and epidemiological vigilance. Also, they have an important role in the education of the general population to help to conserve species, particularly those that are endangered.

In the future, many improvements can be done in the triage, treatment, rehabilitation and release. For that to happen is not only necessary to invest in their infrastructures and staff, but also to continue to collect data in more efficient methods.

## **Conflict of interests**

The authors have not declared any conflict of interests.

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