Antonio Sabater©

The Iberian Lynx Emergency

By Dan Ward

Commissioned by: Dr Caroline Lucas MEP

With the support of SOS Lynx

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The author does not take any responsibility for the use that may be made of this report.

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Executive Summary

- This report provides a broad and up-to-date overview of the emergency situation of the Iberian Lynx, based upon interviews with lynx experts from governmental, non-governmental and international organisations, and a review of available literature.

- The Iberian Lynx is the most endangered feline in the world. Only two breeding populations can be confirmed, both in southern Spain, containing together just 120-155 individuals, and these may soon disappear unless significant changes occur.

- The Iberian Lynx has drastically declined due to high non-natural mortality, habitat loss and fragmentation, and rabbit decline, caused by hunting, infrastructure developments, land-use changes and introduced rabbit diseases.

- The two surviving breeding populations – in Doñana and Andujar – are very small and isolated, and continue to be threatened by land-use changes, hunting, new infrastructure projects, road-kills and low genetic and demographic diversity.

- In order to conserve the Iberian Lynx it would be necessary to remove hunting and road kill pressures, protect habitat from development, restore habitat, recover rabbit populations, provide extra food for lynx, prevent new diseases being introduced into lynx populations, create a captive breeding population, and reintroduce and/or translocate animals. Any one of these actions, such as captive breeding, would not be sufficient and could only form a part of a wider solution.

- The lynx conservation effort has developed late and slowly, is still new and not very extensive, and has yet to demonstrate a significant impact on the lynx. There has still been no lynx bred in captivity or new wild populations created, and attempts at rabbit recovery, habitat conservation and restoration, and controlling hunting and road kill pressures, have not been very extensive or effective to date.

- Lynx conservation is currently being obstructed by insufficient: political co-ordination; long term funding; public and political support; integration with other policy areas; strategic planning; monitoring; research; innovation; legislation protecting habitat and lynx, and; incentives for conservation on private land.

- Particular actions that are required include: the organisation of a new international lynx conference focusing on the long term; an effective and available rabbit vaccine and selective predator control; a multi-lateral political commission focusing on lynx conservation; a revision of official infrastructure, land-use and habitat protection policies and legislation; urgent approval and implementation of lynx recovery plans and sufficient Natura 2000 areas; increased political campaigning and outreach efforts; more financial incentives for nature protection on private land, and; increased and sustained government financial support for rabbit and lynx conservation.

- The EU has a particular responsibility and ability to act to conserve and recover the Iberian Lynx, but on balance is not doing so at present due to inadequate support and pressure for lynx conservation and inappropriate support, and inadequate control, of infrastructure developments and land-use changes.

CONTENTS

PREFACE by Dr Caroline Lucas MEP

The Iberian Lynx is in an emergency situation. A handful of animals inhabit a tiny range, beset by low genetic diversity, isolation, and on-going threats from hunting, road accidents, habitat loss and lack of available food.

No less dramatic is the apparent inability, or unwillingness, of our European institutions to stop its inexorable slide into extinction. The European Union's (EU) contribution to lynx conservation to date is dwarfed by the subsidies which have been given to forestry and intensive agriculture projects, that have turned natural ecosystems into virtual deserts and native vegetation into exotic plantations, and to new dams and roads that have fragmented habitat and increased lynx mortality. Persecution of lynx and rabbit diseases may have decimated the lynx population, but it is EU policies that have helped to make it unviable in many areas.

All that can change, however. The European Union has the opportunity to use its considerable resources, power and expertise to ensure Europe does not become the setting for what would be a conservation disaster – the first big cat extinction in modern times. Saving the lynx requires a European vision and a European sense of ownership for a species which is endemic to our region and found nowhere else.

But where should we begin?
Firstly, the European Union has to accept its responsibility, duty and potential to address the current situation, and recognise that it is an emergency not just for the lynx, but also for the reputation of the EU's environment and conservation policies. Secondly, the European Commission and Member States need to provide more long-term funding and legislative support for lynx, rabbit and habitat conservation, particularly on private land.

Thirdly, the European Commission needs to exercise its considerable political power to pressure Spain and Portugal to implement lynx recovery plans and enforce controls on hunting. Finally, the European Commission needs to ensure that its funds are no longer given to projects that destroy lynx habitat and lead to more lynx mortality.

This report could be a watershed for the Iberian Lynx. If we heed it, we may still be in time to save the crown jewel of Europe’s wildlife. If we ignore it, we may have lost our last chance to save the lynx, and the reputation of conservation in Europe.

Dr. Caroline Lucas is the Green Party Member of the European Parliament for South East England. Caroline is a Member of the Environment Committee and is vice-president of the European Parliament's all-party Intergroup on the Welfare and Conservation of Animals.

FOREWARD by Eduardo Gonçalves

Close your eyes and picture this. A report is published by the world's most highly-regarded wild cat scientists. It states that the cheetah is teetering on the very brink of extinction. Massive destruction of habitat has robbed it of large areas of habitat, it states. Cruel diseases have decimated its prey and reduced many animals to starving vagrants, it reveals. Large numbers of individuals are lost each year through vicious traps and snares, unscrupulous hunters and needless road kills, show the figures. The scientists do something they have never done before - they place the cheetah into its own conservation status category: number one critically endangered.

What do you imagine the reaction to this scenario to be? Governments and international organisations moving swiftly to ensure the cheetah's territories are protected and recovered? Probably. Scientists from all over the world working around the clock to control the prey diseases and ensure food supplies? Quite possibly. Conservationists mobilising public opinion to ensure an end to the ugly mutilations and illegal killings? Almost certainly.

Now open your eyes again. The scenario depicted here happened. But it was not the cheetah that faced such a gloomy future. In 1996, the IUCN (World Conservation Union) Cat Specialist Group published a global survey of the world's wild cats. For one species, the findings were as shocking as they were surprising. The Iberian Lynx, a medium-sized, leopard-spotted cat living exclusively in western Europe, had earned the dubious honour of becoming the world's most endangered feline. And all because of the very causes described above. Only a few hundred animals now remained, scattered among 50 tiny (and mostly isolated) populations, the report revealed. Without urgent action, it warned, the Iberian lynx would inexorably disappear. For the first time anywhere in the world since pre-historic times, we would lose a big cat species.

Fast forward to 2004. Eight years later, what has changed? The answer is not the one you might expect. The situation has got worse. Much worse. Of the 48 breeding populations in Spain that had earlier been found clinging grimly to survival, only two remain. Of the five found in Portugal, none remained. Two populations comprising fewer than 150 animals, of which less than 30 are breeding females - this today is the sum remaining total of an entire species. A species which currently inhabits a range smaller than a European city.

How did things get to be so bad, and what can be done now? These are the questions which this report seeks to answer. It presents politicians, the public and conservationists with the most up-to-date available overview of the situation of the lynx and its prey, the work of official agencies and NGOs, and the immediate and long-term challenges. The "Iberian Lynx Emergency" report – appropriately entitled – sets out the steps we must begin to take if we are to avoid catastrophe. This is an emergency situation requiring an emergency response.

From massive habitat destruction, pitiless persecution and spreading devastating rabbit diseases, humanity has proved itself to be the Iberian lynx's worst enemy. If it is to have any chance of surviving, we must quickly learn how to become its best friend.

Eduardo Gonçalves is President of SOS Lynx

Introduction

The aim of this report is to provide policymakers, campaigners and concerned citizens with the insights and direction to know what they and others could and should do to help make the necessary changes to save the Iberian Lynx. This is achieved by reporting and analysing information from interviews with key experts and representatives of key organisations, and available literature. In particular, this report asks and answers the following questions:

- ***How has the Iberian Lynx come to be critically endangered?***
- ***Why has more not been done to conserve the Iberian Lynx to date?***
- ***What needs to change in order to conserve the Iberian Lynx now?***
- ***What is the particular role of the European Union in lynx conservation?***

Chapter 1 describes the ecology of the lynx and the extent and causes of its decline. Chapter 2 describes the current status of the lynx and threats to the few animals, and areas of habitat, that remain. Chapter 3 describes what objectives would need to be achieved, and actions undertaken, in order to conserve the lynx in the future. Chapter 4 measures the conservation effort against these required actions, and identifies the obstacles that would still need to be overcome to fully implement them in the future. Chapter 5 analyses what needs to change in order to overcome these obstacles and implement the required conservation actions, and Chapter 6 describes the particular responsibility, influence to date and requirements of the EU. Finally, Chapter 7 concludes. An appendix is also provided, detailing the organisations, laws, committees, commissions, plans and strategies most relevant to lynx conservation. This should be consulted to give greater detail on specific elements referred to in the report.

This report is not definitive or uniquely authoritative, and there are other reports and individuals that can describe particular aspects of lynx conservation in more detail. However, this report does aim to bring together in one place, in English, a broad description of the lynx, its conservation to date, and what needs to change to allow the lynx to survive in the future. As far as possible, the situation, and any actions or inadequacies have been assessed from the lynx's point of view, rather than a more partisan or subjective position. Thus this report aims to take stock of the current situation and provide a "call to action" for the future.

1. Lynx Ecology and Decline

1.1 Ecology

The Iberian Lynx (Lynx Pardinus) – also known as the Pardel Lynx - is a distinct species, related to but separate from the Eurasian Lynx, the Canada Lynx and the North American Bobcat. The Iberian Lynx weighs up to 10 kg (females) or 13 kg (males) and is up to 88cm (females) or 1metre (males) long when adult. It is approximately the same size as the Canada Lynx but about half the size of the Eurasian Lynx, which survives in central and eastern Europe. The Iberian Lynx feeds mostly on wild rabbits, but will also eat ducks, young deer and partridges, when available and when rabbit densities are low. An adult lynx needs to eat on average one rabbit a day, but a mother raising young needs to catch about three.

The Iberian Lynx requires a habitat mosaic of scrub forest for shelter and open grassland for rabbit predation and supply, and generally lives between an altitude of 400m and 1300m. The habitat of the much-studied Doñana population is thus atypical. The lynx also requires a good water supply, and low levels of human disturbance. For example, lynx have been shown to avoid exotic forestry plantations and areas of intensive agriculture and urbanisation. Adult lynx live in territories of up to 20 km^2, which they scent mark and defend from each other; though male and female territories may overlap. Territories relate to areas of habitat and rabbit supply, and can change over generations. In general, like many cat species, Iberian Lynx are solitary animals. Male and female lynx only live together immediately before and after mating, and the rearing of young is the sole responsibility of the female.

Female lynx give birth to up to four, but usually just three, cubs. Of these, usually only 1 or 2 survive to independence, depending on the availability of rabbits. Cubs are raised in dens which may be inside old trees or caves, when and where available. Female lynx may move their cubs between up to twelve such homes, to avoid detection and predation. When young lynx are 8-23 months old they leave the protection of their mothers. Male juvenile lynx disperse up to 30 km, whilst female juvenile lynx may inherit a territory from their mothers, or live in a neighbouring area. When they have found a suitable area, and provided they survive long enough, young lynx will create their own territory, which they will seldom leave unless displaced by a rival. Wild lynx can live up to 13 years, but usually die younger, especially when there are significant impacts from humans in the area.

Iberian Lynx pose no danger to livestock, and there have been no recorded cases of attacks on humans. Iberian Lynx are, however, aggressive to other wild carnivores, whom they displace and kill, to safeguard rabbit supplies and protect their kittens. There have been reported cases of lynx killing foxes, Egyptian mongooses and feral cats and dogs, and Egyptian Mongoose have been shown to avoid lynx territories[1]. Thus the Iberian Lynx is a "super predator"[2], the loss of which has knock-on effects for the whole ecosystem, including an increase in the density of more common predators and a consequent decrease in rabbit populations.

1.2 Decline

The Iberian Lynx was once abundant throughout Spain and Portugal, and even parts of Southern France, at least until the early 19th Century. However, over the last two hundred years there has been a rapid, and seemingly accelerating decline. By 1914 lynx were confined to the southern half of Spain and Portugal, but were abundant and constituted one large interconnected "meta-population"; i.e. a group of discrete local populations connected

through dispersing individuals. By 1960 this distribution had contracted to around 3,000 individuals over 57,000 km^2, still constituting one metapopulation. By 1988, in Spain, this situation had deteriorated further to an estimated 880-1150 individuals, including 350 breeding females, spread across 48 populations, covering a range of 11,700 km^2, and constituting 9 separated metapopulations. In Portugal, a survey in 1994 estimated around 40 to 50 animals spread across 2400 km^2 in five populations, some linked with each other and with populations across the border in Spain. However, the most recent comprehensive survey, finished in 2002, confirmed only two breeding populations, isolated from each other, and containing just 120-155 individuals over 350 km^2, both in Andalucia, Spain. This decline in population numbers, range and distribution is shown graphically in figures 1, 2 and 3 below.

Fig 1: Decline in Iberian Lynx numbers

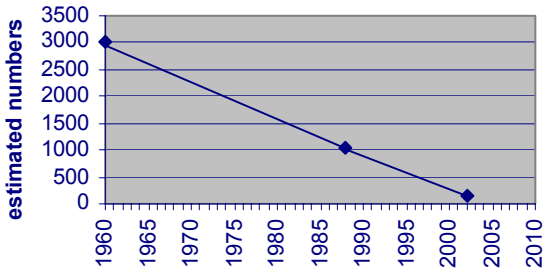


Fig 2: Decline in Iberian Lynx range

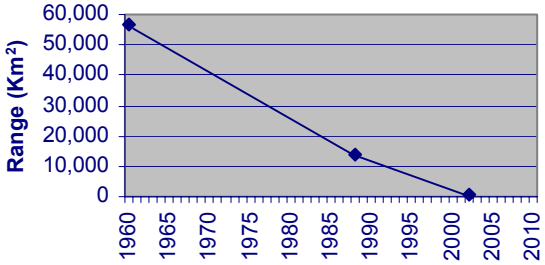
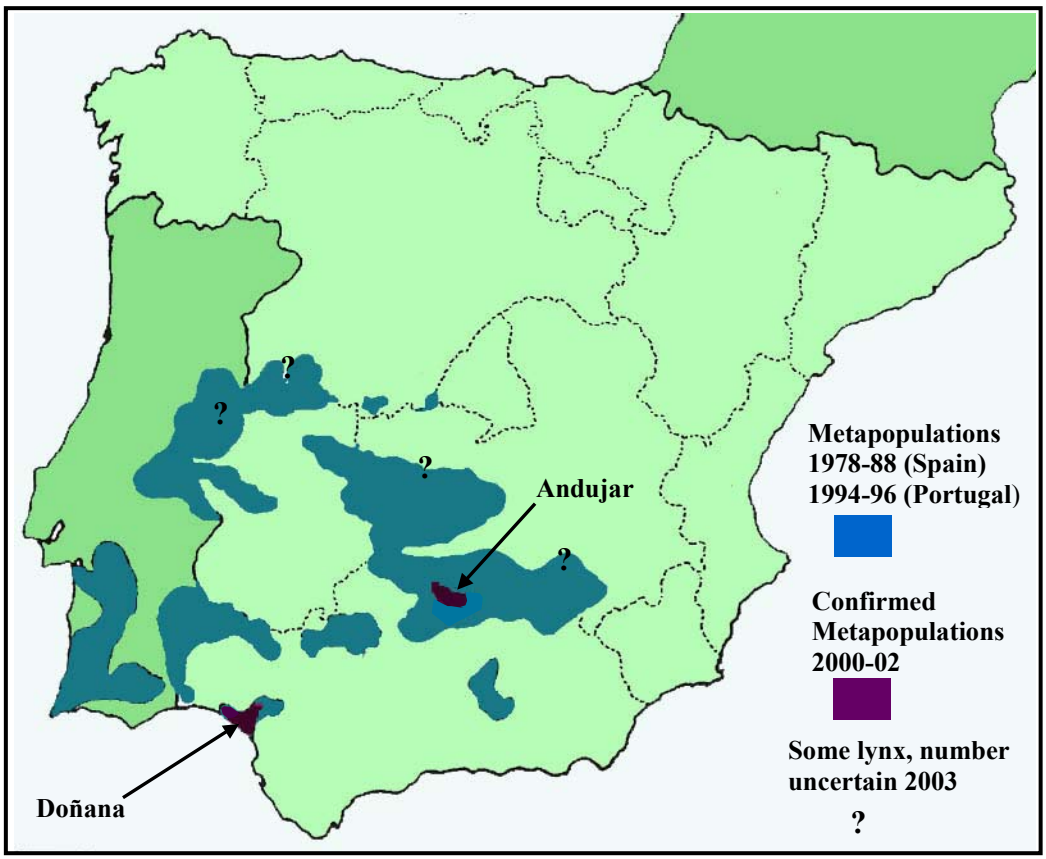


Fig 3: Recent decline in distribution of Iberian Lynx



Sources: Junta de Andalucia (2) (2003), Guzman et al. 2002, Delibes et al. (2000)

Unfortunately, the pace and extent of the decline in the Iberian Lynx is not unique. Many other species, including other cat species, have declined rapidly in modern times. For example, the Eurasian Lynx had gone extinct from most of central and western Europe by around 1900. However, the Iberian Lynx is quite special in that it was only ever resident in a relatively small area, at least in modern times. This means that - in contrast to other countries such as Switzerland, which have reintroduced Eurasian Lynx from populations surviving elsewhere - if Spain and Portugal lose their lynx species there will be no possibility of reintroducing it from elsewhere, as it lives nowhere else. Thus Spain and Portugal have an even greater responsibility to conserve their lynx species, and need to learn from, and not repeat the mistakes of other countries, if the Iberian Lynx is to survive. This will require a thorough understanding of the causes of the decline to date, as described below.

1.3 Causes of decline

The following factors are responsible for the rapid and extensive decline of the lynx:

- High non-natural mortality
- Habitat loss and fragmentation
- Loss of primary prey (wild rabbits)

Each factor has a number of causes and has varied over time, as described below.

1.3.1 High non-natural mortality

Despite legal protection since the 1970s, average annual mortality rates for Iberian Lynx have recently been recorded as high as 37%[3]. This is virtually the same as for *harvested* Bobcats[4]. High mortality is particularly serious for the small and isolated populations that exist at present, as the survival of each individual is important for genetic and demographic diversity, and hence population survival. In addition, much of the historic decline in lynx is due to high non-natural mortality. There are now two main causes: hunting and road kills.

Hunting has been[5] and probably remains[6] the main cause of non-natural mortality in Iberian Lynx. Until the mid 20th century lynx were killed extensively both as a game species and due to their supposed negative impact upon small game stocks. For example, up until 1937, some 500 lynx pelts were sold every year in Spain[7]. This mass slaughter continued up until the 1970s with the support from official "vermin extinction councils"[8], which paid rural people to lay traps, snares and poison baits for wolves, lynx, vultures and many other now endangered animals. Lynx became legally protected in 1973 in Spain and 1974 in Portugal. However, deliberate lynx hunting continued, and still continues today, e.g. in November 2003 a dead young male lynx was found in Andujar that had been shot at close range with a shot gun[9]. Moreover, lynx have also been killed a lot by non-selective predator and rabbit control methods including gin traps and snares. Although not targeted specifically at lynx, these methods are still extensively used and have killed many lynx, and have been particularly important in causing the extinction of lynx populations already reduced in size and range by habitat loss and rabbit decline. For example, the Montes de Toledo population (in Castilla - La Mancha, Spain) of around 200 lynx in 1988 has all but disappeared due to predator control pressures, even though some rabbits and habitat remain[10]. Similarly, a study in northern Andalucia found that predator control traps may kill 25% of lynx every year[11], whilst overall deaths from hunting and game-keeping activities accounted for some 50% of all mortality in Doñana in the 1980s[12].

Road kills were an insignificant cause of non-natural mortality until the 1980s. However, the increase speed in traffic, coupled with the construction of new roads through and around known lynx areas, has led to a rising number of lynx deaths, and road kills are now second only to hunting as a cause of non-natural mortality: at least 10 lynx were killed by vehicles in the last two years alone[13]. Road construction has accelerated due to demands from economic growth, road policies and local residents, and with significant EU subsidies.

Other causes of non-natural lynx deaths include drownings in wells, particularly around Doñana, and disease, particularly Tuberculosis, possibly introduced into some lynx populations by close contact with domestic cattle or deer. Two lynx are known to have died from TB in Doñana alone, and four have died there by drowning in wells. In addition, further disease is expected, and may already exist, due to the very un-natural state of small, isolated, genetically homogeneous populations, caused in-turn by the combined effects of high non-natural mortality, loss of rabbits and habitat loss and fragmentation.

Figure 4: at least one lynx has already been killed on this newly constructed road through Donana Natural Park.

Figure 5: autopsy on a lynx, killed by a vehicle. (photo: Antonio Sabater©)

1.3.2 Habitat loss and fragmentation

Any large mammal, such as the lynx, cannot survive without suitable interconnected habitat, even without high non-natural mortality. The Iberian Lynx requires a forest-scrub-pasture mosaic, with at least 25-35% bush cover[14], which used to be abundant across Spain and Portugal as it was compatible with agro-forestry and low-intensity grazing of sheep, cattle and pigs. However, recent land-use changes have caused a drastic reduction in lynx habitat, and have fragmented and isolated the habitat that remains. This has had a significant impact on lynx, and has been blamed for much of the range contraction over the last 50 years[15]. Lynx are particularly sensitive to habitat loss as they are very territorial and cannot easily flee to far off remaining pockets of habitat, as, for example, is possible with some bird species. Current loss of Mediterranean scrub-forest is estimated as 1% per year[16].

Much prime lynx habitat has been lost to intensive forestry, especially exotic pine and eucalyptus plantations. Such areas have been shown to be avoided by, and unsuitable for, lynx populations, due to the lack of a vegetation under-storey or support of rabbit populations. In addition, exotic species, such as Eucalyptus, have helped increase the incidence and spread of forest fires – and thus further loss of lynx habitat – as they are less fire retardant than native trees. Intensive forestry accelerated in Spain and Portugal through the twentieth century, driven by a desire to balance use and production of wood, and exports and imports in general,

and the increasing demand for wood from the paper and other industries. Exotic tree species introduced in the 19th century were particularly economic attractive as they grow faster and produce more wood than native species, and governments have actively promoted intensive forestry, particularly at the expense of Mediterranean scrub-forest. For example, under a Spanish Government plan, 1 million hectares were planted with Eucalyptus between 1940 and 1960 alone[17]. Many more areas have been planted with Eucalyptus since, and planted with other problematic species, including exotic pine. Moreover, loss of lynx habitat to intensive forestry has continued up until the present, helped particularly by increased subsidies and demand for wood products when Spain and Portugal joined the EU in the 1980s[18].

Figure 6: clearing felling and Eucalyptus plantations in Southern Portugal, which cannot support lynx.

Figure 7: intensive strawberry agriculture around Donana, Southern Spain, that has destroyed and fragmented habitat

Along with forestry, the development of intensive agriculture in Spain and Portugal has been a main cause of the loss and fragmentation of lynx habitat over the last 60 years. For example, massive clearing of Mediterranean scrub-forest occurred in the 1940s in Portugal as part of the "wheat programme"[19].Moreover, much intensive agriculture initially proved unsustainable due to a lack of sufficient soil fertility, rainfall and water for irrigation. Thus lands were abandoned and new areas of lynx habitat were consumed. Subsequent developments in irrigation and "greenhouse" technology has enabled vast areas, particularly of SW Spain to be developed for intensive fruit and vegetable production. Recent economic demand and policies have also favoured a return to olive and almond farming, but this too has become intensive with monocultures of trees, little or no under-storey and reduced biodiversity[20]. In general, intensive agriculture cannot support lynx due to a lack of scrub.

Additional causes of habitat loss and fragmentation, include some mines and factories, and urbanisation – both legal and illegal – particularly in recent years when there has been a reversal of previous trends from the countryside to the cities. In addition, there have been many dams, pipelines and roads constructed that have consumed lynx habitat. These accelerated particularly since Spain and Portugal joined the EU, with more funds then being available to proceed with projects that may have been planned previously but where then not economically viable. Examples include the recently completed Alqueva dam and A2 motorway in Portugal and numerous dams in the west and north of Andalucia. The impact of these projects is particularly significant given that local lynx populations were already small, fragmented and vulnerable due to high mortality, other land-use changes and rabbit loss. Moreover, dams have flooded valley bottoms, which tend to be the best lynx habitat[21].

1.3.3 Decline of wild rabbits

The Iberian Lynx is a food specialist and its diet consists of 80-85% wild rabbits. Thus the fate of the lynx is inextricably linked to that of the rabbit. When rabbit densities are low, both survival and reproduction rates of lynx decline, and when rabbit populations disappear so do lynx. This did not used to be a problem, since rabbits were once abundant in Spain, known by the Phoenicians and Romans as "the land of the rabbits"[22]. However, rabbit numbers have recently fallen sharply in Spain and Portugal, and today populations are only 5% of what they were in 1960[23]. As a result, lynx populations have also disappeared, and surviving lynx populations – in Doñana and Andujar – are limited to areas where rabbits have also managed to survive. Moreover, rabbit populations have tended to fragment into small sub-populations, which has caused lynx populations to also fragment, making them more susceptible to local extinctions due to hunting pressure, habitat loss, road kills or stochastic factors[24].

The main driving force of the recent decline in rabbits has been introduced diseases. Myxomatosis spread into rabbit populations in Spain and Portugal from France[25] in the 1950s. Then, just as populations were starting to recover, Viral Haemorrhagic Pneumonia (VHP) was introduced in the 1980s. Both diseases destroy whole populations, unless and until resistance is evolved, and both diseases still exist as epidemics in Spain and Portugal, cycling unpredictably with weather and climate changes. Myxomatosis and other diseases have been introduced in many other countries, but rabbit populations have subsequently recovered. However, in Spain and Portugal, intensive hunting, habitat loss, over-grazing by livestock and big game, and natural predation are probably higher than elsewhere, and have meant that rabbit populations weakened by disease have subsequently crashed and not recovered.

Over 30 species predate rabbits in Spain and Portugal, and densities of foxes in particular have increased recently, partly due to the absence of lynx and other top predators including wolves, but also due to their tolerance of, and adaptability to, humans. Densities of feral cats and dogs, that also predate rabbits, have also increased, possibly due to increased urbanisation in previously rural areas[26]. Moreover, hunting managers, frustrated by the decline in rabbits have allowed hunts to take place even during the rabbit breeding season, so as to maintain bag counts, which has further frustrated population recovery and prevented individuals that may be immune to diseases passing on their genes to the next generation[27]. Similarly, big game hunting managers have kept boar and deer populations artificially high, so as to earn more from commercial hunts, with the result that rabbits have suffered increased food competition and predation. In addition, land-use has changed generally since the 1960s with extensive agro-forestry – which probably benefited rabbits – giving way to intensive agriculture and forestry or abandoned and returned to closed forest, neither of which support high rabbit populations. For example, eucalyptus plantations are particularly problematic as they lower the water table, reducing the availability of vegetation for rabbits to feed on[28].

1.4 Conclusion

The Iberian Lynx is a unique species that has declined rapidly and extensively due to a combination of high non-natural mortality, habitat loss and fragmentation and the loss of prey, caused by hunting, land-use changes, infrastructure projects and introduced rabbit diseases. These factors have not been overcome and as a result, very few lynx now survive, and those that do continue to be threatened, as detailed in the next chapter.

2. Current Status and Threats

The Iberian Lynx is in "critical danger of extinction"[29]. It is the first ever feline species, to have been given this status. Only two known breeding populations survive at Doñana and Andujar, both in Andalucia, probably now containing only around 35 and 100 individuals respectively[30]. Moreover, these populations: now contain, respectively, only 5-8 and 20-25 breeding females with territories[31]; are isolated from each other; are separated by 200 km, and; are fragmented into smaller sub-populations. Proof of individual lynx (DNA tested hair and excrement samples) has also recently been found in Guadelmena[32] and Montes de Toledo[33] (both in Castilla - La Mancha, Spain) and in Portugal. However, these individuals probably do not constitute viable breeding populations, are completely isolated from the breeding populations in Andalucia, and are thus not expected to survive very long.

The Iberian Lynx is in an "extinction vortex"[34]. Any major disturbance to the two remnant populations, or even just their small size and isolation, may lead to extinction. The Doñana population is too small to be genetically or demographically viable in the long term[35]. Random fluctuations in the sex ratio of birth and death rates, and likely disease and genetic disorders caused by inbreeding (as has already been detected[36]) means that the population may not survive more than a few more lynx generations, even without outside disturbance. The Andujar population is larger and more viable. However, experts also class it as unviable without conservation intervention[37] and, like the Doñana population, it has declined significantly over recent years and if this continues it too will be condemned in the long-term. Moreover, if this decline continues at current rates, neither population may survive long enough for genetic or demographic factors to be significant.

Lynx censuses conducted in Doñana in 1993 recorded between 50 and 60 individuals[38]. Thus the current population of around 35 represents a 30% to 40% decline in just ten years. Similarly the Andujar population of around 100 individuals has declined by 66% to 75% from the population of 300 to 400 estimated there in 1988. Other populations estimated in 1988 as having a similar size to the current Doñana and Andujar populations have subsequently gone extinct. For example the Montes de Toledo population was estimated in 1988 at 200, and considered as viable, but today only a few individuals survive. Moreover, the threats that have caused the lynx decline generally, and the decline in Doñana and Andujar to date, have not been removed. For example, last year at least 3 lynx were killed by vehicles and 2 shot[39]. By contrast the conservation effort has not been going very long, is not very extensive and has yet to demonstrate a significant impact on the lynx. Thus, the lynx will probably go extinct within a relatively short time, unless threats to the two remnant populations and potential habitat, as detailed below, can be quickly removed.

2.1 Doñana population

The current Doñana population of around 35 individuals is spread across 15,000ha in parts of Doñana National and Natural Parks, Natura 2000 areas and non-protected areas, at a relatively low density. Lynx probably survive here rather than elsewhere because rabbits also survive and because the protected areas offer some protection from development and hunting. The population is fragmented into 4-5 subpopulations, the largest of which contains 2-3 breeding females and is located within the National Park. Smaller breeding sub-populations, each containing one or two breeding females, are located outside the National Park. The distribution has changed compared with ten years ago, when most of the breeding females were located within the National Park. Now only half are. This is partly due to some re-

colonisation of areas to the west of the National Park where Eucalyptus have been removed and suitable lynx habitat recovered over recent years. However, it is mainly due to a worrying decline in lynx within the protected area. This includes the most studied and protected area, the 7,000ha "biological reserve", where now only 4 lynx survive, compared with the 11 lynx that lived there twenty years ago[40].

The recent decline in lynx within the national park (50% in 10 years) is mainly due to the severe decline in rabbits, itself blamed upon the arrival of VHP in Doñana in the 1990s[41]. However, it has also been alleged that lynx still die within the National Park due to hunting and that the park management have failed to provide adequate water supplies for lynx in summer, with the result of some dieing of thirst. Radio collar surveys conducted until the mid 1990s to study rates and causes of mortality are not currently undertaken and it is thus not possible at present to confirm or refute these accusations. In addition, the number of domestic cattle within the park has increased considerably in recent years, which have allegedly introduced TB into the area (TB is already known to have killed two lynx) and may have reduced rabbit numbers by trampling habitat and competing for food.

Lynx have died outside the National Park due mainly to hunting pressure and road kills. Many of these animals are quite young, dispersing individuals – especially males – but resident, mature adults with territories are also at risk and lynx outside the park do not usually survive more than 5 years[42]. In particular road kill pressures have increased in recent years with the surfacing and upgrading of a number of previously rough forest roads into fast inter-urban roads. These include roads between El Rocio, Villamanrique, Almonte and Matalascañas, where traffic now travels in excess of 100km/h. Over the last few years 2-3 individuals have been killed every year by vehicles around Doñana[43]. Moreover, beyond high lynx mortality there is also on-going habitat loss in this area due to intensive agriculture developments and urbanization, both illegal and legal, which consume and fragment habitat. As a result many actual and potential lynx areas have been lost and the remaining Doñana lynx population is an "island" with little opportunity to expand[44].

2.2 Andujar population

Much less is known about the Andujar than the Doñana population because it has been much less studied. However, it is known that the current population consists of around 100 individuals, of which approximately 20 are breeding females, and is spread across 20,000 hectares and fragmented into two subpopulations; representing quite a high density. The population mainly survives on private big game hunting estates within the Andujar and Cardeña Natural Parks, in northern Andalucia. Lynx have survived here rather than elsewhere because rabbits and habitat still survive here, and because the management of big game hunting tends not to use non-selective predator control methods that were so devastating to lynx that disappeared from rabbit hunting areas where rabbits still survive, such as Montes de Toledo. However, lynx are still killed in Andujar by deliberate and accidental hunting, and the management of big game hunting reserves here tend to keep deer and boar populations artificially high – with consequent competition and predation pressures on rabbits – due to substantial financial incentives from commercial hunters. In addition, lynx in Andujar are regularly killed by road traffic – at least three were killed here in the last two years alone – and the relatively small range and high density of the population makes it particularly vulnerable to disease, rabbit loss, disturbance by new development or forest fires.

The Andujar population is recognised as the most important because it is larger and more viable, and unlike the Doñana population, is continuous with large areas of potential habitat

into, which it could expand if hunting pressure could be removed and rabbits recovered. However, there are a number of proposed infrastructure projects that would threaten both the Andujar population and plans for its future expansion. In particular, a new motorway is currently proposed by the Spanish Government between Toledo and Cordoba, passing within a few kilometres of the western side of the Andujar lynx population, potentially killing resident lynxes, killing dispersing lynxes and forming a barrier to the planned future westward expansion of the population. If implemented, this motorway could tip the balance towards population extinction[45]. In addition, it is currently proposed to link the reservoirs of Jandula and Encinarejo on the eastern edge of Andujar Natural Park, to form one large reservoir[46]. This would destroy a large area of current lynx habitat.

2.3 Other areas

Although there is uncertainty as to their numbers, at least some individual lynx do still survive in Guadalmena and Montes de Toledo in Castilla - La Mancha, in the Sierra de Gata in Extremadura and Castilla y Leon, and in areas close to the Spanish border in Portugal, and more may still exist elsewhere. Thus these areas need to be protected to safeguard the lynx that still survive there in the short term, and because the habitat and rabbits that still survive there, if not the lynx themselves, are likely to be important for attempts to recover a wider lynx metapopulation in the longer term. However, many of these areas are under threat from current proposals and projects to create new infrastructures. For example, the Toledo – Cordoba motorway proposal, beyond killing lynx and destroying lynx habitat in Andalucia, would also fragment and destroy actual and potential lynx habitat in Montes de Toledo. Similarly, there is currently a proposal for a new motorway between Linares and Albacete, which would pass right through the area where lynx have most recently been detected in Guadalmena[47]. In addition, the already started development of a new dam in Odelouca, Portugal, would flood a valley where lynx may well still be present.

A number of current proposals for infrastructure projects and land-use changes threaten areas of habitat from which lynx have become extinct, but which could be vital for the future recovery of a viable metapopulation, either as new breeding areas or as corridors linking up potential and current breeding areas. These include proposed dams in-between Doñana and Portugal and in the Sierra Morena, such as La Breña II, and several new motorways and railways. WWF Spain has compiled a list of 45 infrastructure proposals and projects that threaten lynx and areas of potential lynx habitat[48]. In addition, intensive forestry and agriculture developments continue to consume valuable potential lynx habitat[49].

2.4 Conclusion

The Iberian Lynx is in critical danger of imminent extinction. Only two viable breeding populations remain and these are small and isolated, and under threat from hunting, intensive agriculture, new roads and dams. Moreover, even if these populations can survive beyond the short term, additional threats in other areas would currently prevent the recovery of the lynx elsewhere. What would need to happen to save the lynx is considered in the next chapter.

3. Conservation Objectives and Actions

The Iberian Lynx is a beautiful and ecologically important creature. The loss of any species is a tragedy, but the loss of the Iberian Lynx would be particularly grave given its important ecological role as a top predator. It would also be a disaster politically and culturally, being the first loss of a big cat species in modern times, and would send the wrong messages to less developed nations already struggling to conserve their endemic species. Thus the lynx must be conserved and recovered, and how this might be achieved is considered below.

3.1 Objectives for lynx recovery

The following objectives are based on advice from lynx experts and available literature.

3.1.1 Metapopulation

The ultimate objective for lynx recovery needs to be the re-creation of a self-sustaining "metapopulation" in Spain and Portugal that is stable and viable in the long term, and does not need costly and unsustainable conservation interventions. This metapopulation needs to contain several interconnected populations so that it is large enough in terms of individuals and has enough genetic and demographic mixing to be viable. In addition, for the sake of the lynx and political considerations, it would be important that this metapopulation covered both Spain and Portugal, as the lynx was, and still is, endemic to both Iberian countries.

This metapopulation will not represent a full recovery of the lynx's historical distribution, as this is not necessary for long term viability and is unrealistic given the increased level of human habitation and development compared with previous centuries. Similarly, this metapopulation may not represent a distribution that has previously existed at any one particular time, because the different areas that would be most appropriate to include in a metapopulation – in terms of habitat and prey availability and low human disturbance – may have lost their original lynx populations at different times in the past.

In order to achieve a stable metapopulation, the area that it is to occupy needs to be strictly protected from development and fire. Some areas of habitat will also need to be restored, and specific barriers to lynx passage removed, because areas of remaining habitat may be too small and fragmented to support a metapopulation, even if strictly protected from now on. In addition, hunting and land-use practices will need to change and become more benign towards the lynx, and rabbit populations will need to be recovered, and maintained, over a large area because extensive and sustained lynx supplementary feeding would not be economically viable. Moreover, the creation of a metapopulation will also require that there are several lynx populations to be connected into one metapopulation, which do not currently exist.

3.1.2 Create new populations

The two surviving remnant populations, even if they are expanded and connected, would not be enough to recover a viable wild metapopulation, and extra new wild populations will need to be created. This will require the conservation and restoration of habitat, rabbit recovery and the removal of hunting and road kill pressures that contributed to original local extinctions and would prevent the creation of new populations. In addition, animals would either need to be translocated from other wild populations or reintroduced from a captive population, in either case, in significant numbers and with sufficient skills and genetic diversity to constitute

a viable population, at least in the short term, while habitat corridors linking them to other populations may still be being developed. Translocations and reintroductions have been successful with other species, for example with the Eurasian Lynx in the Alps, translocated successfully from the Carpathian Mountains in Slovakia[50]. However, there is no guarantee of success and much will need to be learned. In addition, translocations will probably require the prior expansion of existing remnant populations, so that the removal of significant numbers of animals does not represent a substantial drain on the donor population, and reintroductions would require the prior creation of a captive breeding population, which does not yet exist.

3.1.3 Create a captive breeding population

A captive breeding population will be required if reintroductions are to be used for creating new wild populations. In this case, captive animals would need to be sufficiently socialised on each other, and not humans, have the skills to be able to survive in the wild, and be bred to about 30 individuals, starting from a founder population of twelve: seven females and five males[51]. In addition, a captive breeding population could assist with outreach and research, and could provide animals and animal material to help maintain the genetic viability of future wild populations. A captive breeding population could also help to maintain an Iberian rather than a Spanish or Andalucian lynx – even when, in the short term, lynx may disappear in the wild outside of Andalucia – if some breeding centres are located outside of Andalucia. In all cases, a captive breeding population would need to be based in several centres so as to spread expertise and the lynx themselves, and avoid a single catastrophe – such as disease – wiping out the entire captive population[52]. Finally, in order to create a captive breeding population it will be necessary that there are still healthy, wild populations from which to acquire founder individuals.

3.1.4 Expand existing populations

In order to be large enough to supply significant numbers of animals for translocations, and to be genetically and demographically stable in the medium term, whilst a metapopulation is still being established, the existing two remnant populations will need to be expanded. This will require habitat conservation and restoration, rabbit recovery, and the reduction in hunting and road kill pressures, on areas surrounding the existing populations. As a result, lynx would be able to naturally expand into new neighbouring areas and increase the size and viability of the two surviving populations. However, this would also require that the Doñana and Andujar populations are stabilised and survive through the short term.

3.1.5 Stabilise remnant populations

In order to have animals to create new wild or captive breeding populations, and to form the first part of a future interconnected metapopulation, the two remaining populations must be stabilised. Moreover, if either population goes extinct it would become very hard to achieve the short term survival of the species, let alone the longer term creation of a viable metapopulation. This stability would require the removal of existing, and the prevention of new, hunting and road kill pressures, the avoidance of introducing new diseases into lynx, habitat conservation, habitat restoration, rabbit recovery and – possibly – the exchange of individuals between the two populations to maintain genetic and demographic diversity. In addition, the sub-populations within the two remnant populations would need to be linked up and, in the short term, supplementary food would need to be made available to lynx until rabbits are recovered. Moreover, if, as is possible, there are surviving lynx populations outside of Doñana and Andujar, these also need to be stabilised, requiring the same actions.

This is needed both to conserve as many lynx as possible and to preserve political pressure and legal requirements for lynx recovery, which would be reduced if lynx go extinct from a particular region[53].

3.2 Required actions

In order to conserve the Iberian Lynx, the following actions are required:

- **Conserve habitat and corridors** in current and potential lynx areas.
- **Restore habitat and corridors** in current and potential lynx areas.
- **Reduce hunting pressures** in current and potential lynx areas.
- **Reduce road kill pressures** in current and potential lynx areas.
- **Create a captive breeding population**, of around thirty healthy, diverse individuals, socialised on each other and skilled to survive in the wild.
- **Reintroduce lynx** from a captive population**,** into appropriate areas, in sufficient numbers and with sufficient diversity to constitute viable populations.
- **Translocate** diverse individuals**,** from Doñana and Andujar to other appropriate areas, in sufficient numbers, and between the two remnant populations.
- **Recover rabbits** in current and potential lynx areas.
- **Provide supplementary food to lynx** in current lynx areas in the short term.

3.3 Conclusion

The obvious short term objective of lynx conservation is the stabilisation of the surviving populations, without which neither the lynx, nor lynx conservation, will have any future. However, much work is also needed now towards achieving the other longer term objectives including expanding the remnant populations, creating a captive breeding population, creating new wild populations and, ultimately, linking up various populations to recreate a stable viable metapopulation. This is because if work is not started now towards longer term objectives, they may be much harder, if not impossible to achieve in the future, and that if these longer term objectives are not achieved, the stabilisation of the surviving populations will have been in vane, because they will still be too small and isolated to be viable.

To achieve all the objectives, a number of actions will need to be undertaken, as detailed above. Each of the actions could be achieved, and none are as problematic as specific challenges faced in the conservation of "conflict species" such as tigers, which eat livestock and people. However, the particular challenge with lynx conservation is that so many different actions need to be undertaken, and quickly, given that the lynx is already very close to extinction. The progress that has been made to date in implementing these actions, and the obstacles that need to be overcome to implement them in the future, are considered in the next chapter.

4. Progress and Obstacles

Many of the actions outlined in the previous chapter have already been recognised as important, and some have been partially implemented. This has occurred within a framework of organisations, laws, plans, committees, co-ordinators and conferences, as detailed in the Appendix. However, in general, lynx conservation started late and has subsequently developed slowly and inadequately. As a result, it is still not very extensive and has yet to demonstrate a significant beneficial impact on the lynx. In particular the "drastic intervention"[54] called for by a number of organisations has yet to be realised. This is due to a number of obstacles, many of which still need to be overcome, as described below.

4.1 A late start

Iberian Lynx conservation started to develop late, when the species was already approaching extinction and little time was left to change the situation. Most of the required conservation actions were not being planned, let alone started, twenty years ago, and the lynx only became legally protected in the 1970s, when numbers had probably already declined below 2,000. This is in contrast to other cat and mammal species, such as the tiger, which have been actively conserved for several decades, and when populations still contained tens of thousands of individuals. This late start to lynx conservation is problematic, and needs explaining, given that it has meant that organisations and professionals have had a limited time to develop conservation initiatives before the lynx might go extinct due to uncontrollable factors. There were several obstacles that prevented an earlier start to lynx conservation:

- **Low public and political support and pressure for conservation in general;** during the 1940s – 70s Spain and Portugal were governed by dictatorships, and in the 1970s they changed from slow to rapidly growing economies. This meant that, there was little regard by, or public pressure on, policymakers for nature conservation in general, let alone to conserve particular species such as the lynx, at least until the 1980s.

- **Little international support and pressure for lynx conservation;** due to their respective dictatorships, Spain and Portugal were relatively internationally isolated, including from the rest of Europe, until the arrival of democracy in the mid-1970s. This meant that international organisations and governments did not know much about, or have the power to influence nature conservation in Iberia, until recently. In addition, the international community has tended in general to focus on the need for nature conservation in developing countries in Asia and Africa over developed countries in Europe, and on the need to preserve particular well known and large species, such as the tiger, rhino and whale. Together this has meant that international pressure on Spain and Portugal to conserve lynx was minimal until the 1990s.

- **A lack of scientific knowledge of the lynx and its decline;** historically the Iberian Lynx was mistakenly regarded as a sub-species of the Eurasian Lynx, due to its similar appearance, thus not meriting special study or conservation. This view persisted in publications until quite recently. Similarly, little was known about the extent and causes of lynx decline – due to a lack of monitoring and a weaker scientific tradition in Spain and Portugal than in some other European countries – which meant that policymakers and potential and actual campaigners did not know how serious the problem was, and thus did not pay the lynx enough attention, at least until the 1980s.

Since the early 1980s, there has been a significant rise in political and public support for nature conservation in Iberia, international support for lynx conservation, and scientific knowledge about the lynx and its decline. For example, in the 1980s, studies were carried out that documented the extent and causes of lynx decline, and the status of the lynx as a distinct species, and national and regional governments in Iberia have developed new protected areas and conservation projects, with public support, that have helped to recover endangered species such as the Spanish Imperial Eagle. Similarly, since the early 1990s, the EU has provided significant funds for lynx conservation via its LIFE programme[55], and the Council of Europe[56], World Conservation Union and, later, the "Large Carnivore Initiative"[57] - set up by the World Wide Fund for Nature (WWF International) in 1995 - have recommended and technically supported and co-ordinated a number of actions aimed at lynx conservation.

There is still a need for more political and public pressure for nature conservation in general in Spain and Portugal, and international support and pressure for lynx conservation could and should be increased. Similarly, there are still a number of areas of scientific ignorance of relevance to lynx conservation, which should be addressed by researchers, as detailed in section 5.3. However, in general, the level of scientific understanding of the lynx and its decline, international support for lynx conservation and public and political support for nature conservation, are no longer significant barriers to lynx conservation or excuses for inaction. Nevertheless, since the 1980s, the lynx conservation effort, although started, progressed quite slowly and inadequately, due to a number of additional factors. Moreover, this slow progress combined with the late start, has meant that many of the required conservation actions have still not been adequately, if at all, planned or implemented, as described below.

4.2 Recovery plans

The slow and late development of lynx conservation can be seen particularly in the development, or rather the lack of development, of lynx recovery plans. The Spanish law 4/89, passed in 1989, mandated all Spanish regions to produce recovery plans for endangered species, such as the Iberian Lynx. Similarly in 2000, the Council of Europe called for Spanish regions and Portugal to "urgently approve and implement" recovery plans[58]. However, to date only one region – Castilla - La Mancha – has approved a recovery plan, and then only in 2003, by which time most of the lynx in this region had disappeared. Not even Andalucia, where most lynx survive, has an officially approved plan, despite having a draft prepared for the last four years. Similarly, Portugal has yet to approve a National Lynx Plan, although again it has a draft plan which is currently being considered by conservation organisations. Spain does have an officially approved Lynx National Strategy, since 2000, produced partly in response to international pressure and advice. However, in Spain, it is the regional rather than the national governments that are primarily responsible for nature conservation, and thus the lack of officially approved regional recovery plans is more important.

The reason that has been suggested to explain why Spanish regions and Portugal have mostly not yet approved lynx recovery plans, despite having drafts prepared by technical personnel for a number of years, is that the political support of the plans, and lynx conservation in general, has not been sufficient. This has allegedly meant that bureaucratic inertia has not been overcome, and, in particular, that recovery plans have not been implemented in the face of strong opposition from political and economic interests involved in developments that would need to be more tightly controlled to conserve lynx. Moreover, this lack of approved plans is important and may be a handicap to lynx conservation, given that, without them the need for specific projects may be overlooked, whilst those projects that are implemented may be less well co-ordinated, less effective and have a lower political priority than they would if

an official plan existed. However, beyond the slow and late development of official plans, the development and implementation of particular conservation actions – even when mandated by official plans – has also been slow and obstructed, as described below.

4.3 Conserving habitat and corridors

In order to conserve the Iberian Lynx, the habitat that populations currently inhabit, and habitat that will be required by new populations to be created, needs to be conserved, along with adequate habitat corridors connecting these areas. To date, some conservation of lynx habitat and corridors has been attempted and achieved through land-use planning, controls on particular developments, managing public estates and encouraging sustainable development on private estates. However, much more could and should have been done. Moreover, habitat conservation in general is being held up by a lack of detail and decision as to the areas of habitat that are most important to conserve, as described below.

4.3.1 Establishing which areas of habitat need to be conserved

To date, the current distribution of lynx has not been precisely established or communicated. As a result, some areas of habitat that still support lynx have been destroyed. For example, the Alqueva Dam in Portugal, finished in 2002, flooded 400km^2. It is now known that this included up to 100km^2 of actual lynx habitat[59]. However, surveys that demonstrated lynx presence were only completed just before the dam was being constructed, and results were not communicated by the Portuguese Government to professionals conducting the required Environment Impact Assessment[60]. If lynx presence had been more precisely and widely known, the dam probably would not have received EU funds, and thus would not have been constructed[61]. In general, establishing current lynx distributions has been hindered by inadequate historical and current monitoring, and, it is alleged, by governments deliberately withholding information about lynx, so as not to prejudice planned developments.

An appropriate distribution for a recovered lynx metapopulation, and the areas of habitat it would require, has also not yet been precisely defined. In its absence, the ecological basis for deciding which areas to safeguard for any newly created populations has been the lynx distribution reported in 1988. This may well not be the most appropriate distribution for a future recovered metapopulation because it is now known that many of the populations that survived in 1988 were too small to be viable even without human disturbance, and because there are many areas of habitat that could support new lynx populations, but which lost their original lynx before 1988. A more precise and robust distribution for a future recovered metapopulation has not yet been agreed between stakeholders partly because of the difficulty in balancing requirements for surviving habitat, surviving rabbit populations and low human disturbance, which may not been found in the same places. However, there is also a lack of knowledge as to what areas of habitat remain, and decision as to which are important for the lynx. There is now work, co-ordinated by the Lynx Working Group[62] of the Spanish Environment Ministry, to research areas of remaining habitat and classify them as currently or potentially important for lynx. However, this work only started in the last few years and will probably take several more years to conclude and report. In the meantime more common strategic planning is required, particularly between conservation professionals and environmental campaigners, to ensure that priority is given to those areas most likely to be important for the lynx in the future, in campaigns against new or current development proposals.

4.3.2 Protecting habitat through land-use planning and designations

Some important lynx areas have been protected by planning laws and, as a result, important areas of habitat have been conserved. Examples include the Doñana National Park, created in 1969 and enlarged in 1978, where tougher planning laws have prevented intensive agriculture and other development that has destroyed habitat outside the park, and the Malcata Natural Reserve in Portugal, created in 1981 specifically to conserve the local lynx population and its habitat from intensive forestry that would otherwise have destroyed the area. However, many more and more extensive areas have not been legally protected, at least until more recently. This is partly because mechanisms for protecting larger areas have only recently become available. For example, the Natural Parks of Doñana, Andujar and Cardeña could only be created in the late 1980s following the transfer of powers and responsibilities to the new autonomous regions. Similarly, the Natura 2000 system – which offers the potential of protecting extensive, interconnected areas, specifically for endangered species such as the lynx – was only set up by the EU in 1992. However, inadequate legal protection of habitat is also due to slow and inadequate progress in implementing these available mechanisms.

Natura 2000 designations should have originally been proposed by Iberian Governments by 1995[63]. However, proposals are still being debated and have not to date included sufficient areas for the lynx to the satisfaction of either NGOs or the EU. Allegedly this is because of the reluctance of governments to include actual or potential areas that have already been earmarked for development. Examples include a key area linking the Sierra Morena in Andalucia (where lynx survive) with Montes de Toledo in Castilla - La Mancha (where lynx populations could be re-created in the future), as well as the area of land subsequently flooded by the Alqueva Dam in Portugal. In addition even some of those Natura 2000 areas that have already been agreed are already having their habitat destroyed, including by the very same governments responsible for their supposed protection.

The EU's Natura 2000 system aims to "preserve biodiversity through maintaining or restoring natural habitats of community importance". Nevertheless, Natura 2000 areas are currently under threat from a number of dams proposed by the Spanish Government, and approved and part-funded by the EU. A particular example is the Breña II dam which will flood over 2000 hectares of valuable lynx habitat in the Sierra Morena mountain range in northern Andalucia, including over 600 ha of a Natura 2000 zone. The EU commission has agreed that the Breña II dam is acceptable because it only consumes 1% of the Natura 2000 area and because "compensatory measures" will be undertaken involving habitat improvement and management in nearby areas[64]. However, this dam *will* irreversibly destroy 1% - 600ha - of a Natura 2000 area, and there is nothing stopping other projects from further destroying the area, particularly because Breña II has now set a precedent showing that the EU and Member States will permit large infrastructure developments in Natura 2000 areas, even when not motivated by over-riding public interest or safety. The main motive for the Breña II dam is to provide water for irrigation of intensive agriculture in the region[65], which is itself problematic for the environment and driven mainly by EU farming subsidies. In general it seems that the Natura 2000 system could be used to help avoid destruction of valuable lynx habitat, but is not in practice doing so because legal protection is weak and governments' policies, such as the Spanish Hydrological Plan, that are fundamentally contradictory to habitat conservation, are given greater political support.

Although not designed specifically for nature conservation, the designation of land as a "forest estate" in Spain, is supposed to, and also has the potential to, control and avoid inappropriate land-use change. However, Ecologistas en Accion has reported many cases,

particularly around Doñana, where the regional government have failed to act decisively to prevent the illegal conversion of forest estates to intensive agriculture, even when informed of the developments and asked to act by local residents and conservationists. Similarly, fines that have been given after illegal deforestation has taken place, do not seem to reflect the extent of habitat destroyed or be strict enough to act as a significant deterrent to future illegal habitat destruction, and compensation measures do not require the restoration of the original habitat. For example, deforestation of one particular estate, "La Palomera" just outside Doñana Natural Park, involved the loss of 80ha of forest habitat in a known lynx area[66]. This was repeatedly reported and denounced to the Andalucian Government by local residents and conservationists. However, the regional government failed to act to prevent the habitat destruction, only subsequently applied a fine of €1,600, and only mandated that the owner reforest a narrow strip around the estate, and not the whole estate[67]. Moreover, the regional government has even praised the owner of this estate as a supposed example of "sustainable development" in the high profile Doñana 21 initiative[68]. In addition, many other areas of habitat in and around Doñana have been illegally destroyed for agriculture. It has been alleged that this is all because the Andalucian Government gives more political support to intensive agriculture interests than habitat conservation, even in known lynx areas.

4.3.3 Controlling particular developments to avoid habitat loss

Beyond land planning controls there is the potential to control particular large developments to avoid un-necessary lynx habitat loss. Iberian Governments are required under law to scrutinise and control specific large developments, including large infrastructures, agriculture and forestry, particularly under EU Directive 85/337/EEC, which entered Spanish and Portuguese law in 1986. However, required Environmental Impact Assessments (EIAs) do not adequately consider the needs of lynx and lynx conservation, as was found above in the case of the Alqueva dam, and as has been found generally by the Council of Europe[69]. Although partly due to a lack of available information, this is also due to EIAs being open to subjective values[70] and conducted by experts who are allegedly not very knowledgeable of lynx conservation. In addition some developments with an obvious environmental impact still do not require an EIA[71]. Moreover, controls that have been implemented have at times mandated "compensatory measures" that seem not to mitigate or avoid un-necessary habitat loss, and may even serve to legitimise extensive and un-necessary habitat loss. For example, compensatory measures for the Breña II dam, mentioned above, that involve the restoration and management of several nearby small patches of habitat, were mostly already planned and would have been undertaken even if the dam had not been built, and thus can not be considered as compensation for the dam[72]. Thus there seems to be a need to further improve legal and political controls of the EIA process[73]. However, controls on specific developments may always be limited, come too late and be too weak to prevent the implementation of projects that threaten lynx habitat when they are proposed in great numbers by government policies, as at present. This thus needs to be addressed at the policy level, taking particular account of the collective impact of proposed projects.

4.3.4 Appropriately manage public estates to protect habitat

Some appropriate management of public estates has been undertaken by governments to protect and safeguard lynx habitat. However, much more could and should have been done, and in some cases lynx habitat seems to have been less well conserved on some public estates than on nearby private estates. For example, the estate of "Lugar Nuevo" in Andujar – managed and owned by the Spanish Government – supports less lynx than surrounding private estates due to extensive pine plantations created there in the 1960s under government

forestation policies[74]. More recently, higher densities of domestic cows have been allowed onto public areas in Doñana National Park, where they have allegedly trampled and degraded habitat. This is allegedly due to powerful pressure being put on the park authorities by farming interests in the area. There are also on-going problems with inadequate management of public areas to reduce fire risk, particularly in Portugal where a general budget crisis has meant that there is currently no money to employ staff to remove dry, high fire risk vegetation from public estates, including in Natural Parks, and actual and potential lynx areas.

4.3.5 Encouraging sustainable development on private estates

Most lynx survive, and will need to be recovered, on private estates. This is because that is where most lynx habitat survives, and this habitat thus needs to be conserved. Habitat on private estates could partly be conserved by stronger application of planning laws and controls on specific developments. However, the effectiveness of such legal mechanisms will likely always be limited in practice, and will need to be accompanied by incentives to encourage sustainable development that is compatible with lynx habitat. In particular incentives are required to balance the many incentives for land owners to develop their land unsustainably and destroy lynx habitat, as has happened on many estates.

To date, the most effective encouragement of habitat conservation on private land has been commercial hunting. This is ironic because hunting is also the biggest single cause of lynx mortality. However, income available from commercial hunting – that can be as high as €1,000 per animal for big game – has meant that some land owners have not developed intensive agriculture or forestry, that would have done so had this income not been available. As a result, habitat has been conserved and most lynx survive today on private hunting estates. Clearly, the direct negative effects of hunting on lynx need to be addressed, as described below in section 4.8. However, it is important that this is done in a way that does not discourage hunting in favour of other land-uses, which could result in more habitat loss.

Beyond management for hunting, there are many opportunities to encourage private land owners to conserve actual and potential lynx habitat through the promotion of eco-tourism and low intensity agriculture and forestry. However, government subsidies and market forces continue to favour intensive over extensive land-use, and many opportunities for eco-tourism have not yet been realised. In particular, cork oak forests, that have supported lynx and economic activity – including the cork industry and the raising of some livestock – continue to be removed by private land owners as cork prices are low. Synthetic alternatives to cork, which are widely available and actively promoted, may exacerbate this trend. Attempts are being made to market cork as environmentally-friendly, but these have only just begun[75].

4.4 Restoring habitat

Beyond habitat conservation, habitat restoration will also be required to link up and expand existing areas of habitat that have already become isolated and fragmented, particularly around Doñana. This would involve the removal and alteration of some existing forestry and agriculture developments, and some dams, and the natural or assisted regeneration of Mediterranean scrub-forest. This has been undertaken and shown be to effective, for example on the western edge of Doñana National Park, where Eucalyptus plantations have been removed and natural vegetation and lynx populations have recovered as a result. However, some other attempts at habitat restoration have not yet been successful due to inadequate political support. For example, local residents and conservationists have proposed re-foresting

a 300ha public estate as a "lynx reserve" just outside Doñana Natural Park, next to an existing lynx territory[76]. However, the Andalucian Government has rejected this proposal and is instead proposing to develop intensive agriculture on a majority of the estate, even though it is designated as a "forest estate" and is within a Natura 2000 zone[77]. Moreover, much more extensive habitat restoration has not yet even been attempted.

As with increasing habitat conservation, more habitat restoration will require improved precision in defining actual and potential lynx areas and more incentives for sustainable development on private estates. Some funds are now available to private land owners for re-foresting areas with native vegetation in Spain and Portugal, for example through the newly-reformed EU Common Agricultural Policy (CAP) and from some regional governments in Spain. However, these funds still do not balance incentives for intensive agriculture and forestry[78], and have at times led to perverse and destructive results. For example, some farmers have used CAP subsidies for agro-environmental development to remove scrub and replant intensively with fast-growing trees, which results in habitat degradation rather than improvement and significant erosion[79]. In general, habitat restoration will probably be as obstructed as habitat conservation by inadequate public and political support and contradictory policies, and is likely to be even harder to achieve as it will require the reversal rather than just the halting of current habitat loss, and the alteration of actual, as opposed to proposed, economic assets.

Restoration of habitat corridors will be important to link up fragmented habitat. Lynx can pass through habitat of a poorer quality than where they hunt and breed, and corridors could include areas of more intensive land-use including mixed forestry, with a preserved under-storey[80]. However, lynx cannot easily pass through large areas of open ground or over high infrastructures. Thus, these will need to be altered, with the restoration of strips of habitat and hedges, and suitable tunnels under infrastructures. Some work has begun to this end, including, for example, the raising of some sections of a pipeline in Portugal to allow lynx passage. However, much more work is needed and the whole overall trend of habitat fragmentation has yet to be halted, let alone reversed.

4.5 Reducing road kill pressures

Existing road kill pressures threaten both the short term survival and long term recovery of the Iberian Lynx. Thus road kill pressures need to be reduced, which will require both the alteration or removal of existing roads and the prevention of new fast roads through actual and potential lynx areas, including some that are currently proposed, as described below.

4.5.1 Reducing the impact of existing roads

Due to the obvious and well documented impact of traffic on lynx[81], some roads have had new measures installed to reduce these impacts. These include tunnels, fences, rumble strips and signs on roads in Doñana, and some signs and rumble strips on a road through Andujar. However, these measures are not very extensive and have not yet even covered many or most roads through current lynx areas, let alone roads through areas where lynx populations might be re-created in the future. Moreover, the measures that have been implemented to date seem poorly designed and not very effective. For example, traffic continues to travel in excess of 100km/h past signs and over rumble strips, which seem to merely cause noise pollution[82]. Similarly, tunnels constructed on roads in Doñana are often flooded in the winter, as shown below, and lynx experts doubt whether tunnels and fences will ever be particularly effective at discouraging lynx from crossing roads directly.

Figure 8: underpass on Villarmanrique – El Rocio road constructed for lynx passage, flooded (February 2004)

Figure 9: road sign warning of lynx, on road through Andujar Natural Park; but traffic fails to slow down.

A few, more effective measures have been undertaken to slow traffic in lynx areas, including some roundabouts on a road through Doñana, which do significantly reduce traffic speeds. However, these roundabouts are attracting a lot of public criticism and it thus seems unlikely that they will be implemented elsewhere. In general, in order to significantly reduce road kill pressures, existing roads may need to be down-graded. However, this is not currently proposed, and even if proposed it seems unlikely that such changes would be implemented due to probable low levels of public and political support.

4.5.2 Avoiding the construction of new roads

Beyond altering existing roads, there will also need to be an effort to avoid the construction of some new fast roads, in current and potential lynx areas, if road kill pressures are to be sufficiently reduced overall to allow lynx survival and recovery. It is difficult to alter and avoid the implementation of new fast roads once they have been officially proposed and committed to. Thus, existing current regional, national and EU road policies, that continue to propose and support new fast roads through actual and potential lynx areas, will need to be fundamentally changed. In addition, existing proposals for some new fast roads through actual and potential lynx areas will need to be fundamentally altered or rejected. However, on current form it seems unlikely that this will be achieved.

The Villamanrique-El Rocio Road, which goes through the Doñana Natural Park and a known lynx area, was upgraded from a slow forest track to a fast highway in 2002-03. The road has already been the site of at least one lynx death[83], and was not really needed as there is already a slightly longer, but quite adequate route, between the two towns. Moreover, the road was widely condemned by conservationists when first proposed. The road went ahead nevertheless, partly because it did not even require an Environmental Impact Assessment, as it was classed as “road improvements” rather than a new road[84]. How the conversion of a slow, un-surfaced forest track into a fast highway, where lynx have already been run-over, does not have an “Environmental Impact” that needed assessing is hard to imagine.

Despite obvious problems caused by the recent construction of roads in lynx areas, governments continue to propose even more such roads. These are being proposed even when there does not seem to be a strong public need and through Natura 2000 sites, and in the face of strong opposition from government conservation experts and NGOs. A particular example is the Toledo-Cordoba motorway proposal mentioned in Chapter 2. This motorway will go through Cardeña Natural Park, where lynx still survive, and five Natura sites, most of which

contain valuable habitat where new lynx populations could be re-created in the future. It will thus threaten the survival and expansion of the Andujar population and restrict opportunities for re-creating and linking up populations in the future. The motorway is not really needed as there are already two main road links and a high-speed train link between Cordoba and Madrid. One of the road links (N420) is under-used, whilst the other (NIV) is well used and suffers from seasonal congestion at the Despeñaperros pass, but this is already being addressed by ongoing alterations to the pass itself. Moreover, the road is only projected to reduce the 4 hour Madrid-Cordoba journey time by 19 minutes, and then only if one is willing to pay probably quite significant tolls. The new motorway has also been condemned by lynx experts, including the Spanish Government's own Lynx Working Group, and many NGOs.

This continuation with obvious flawed policies is itself problematic. Moreover, if this motorway proposal is implemented - a proposal that threatens an actual and well known lynx area – there seems even less likelihood of avoiding the implementation of other road proposals in other areas where lynx presence is not so well known or where lynx maybe reintroduced in the future. However implementation of this and other motorway proposals, is not expected to be avoided because – it is alleged –the Spanish Construction Ministry is already committed to the project, quite powerful and not strongly influenced by environmental concerns. In addition, legal controls on development in Natura 2000 areas and Natural Parks have already shown themselves inadequate to avoid large infrastructure developments(e.g Breña II; Villamanrique-El Rocio Road). This has prompted NGOs to launch legal challenges, in particular, against the Toledo-Cordoba motorway proposal.

4.6 Rabbit recovery

Given that rabbits have declined to 5% of their 1960s levels, and that rabbit recovery is important not only for lynx recovery, but also for the conservation of other species such as the Spanish Imperial Eagle, as well as for the small game hunting industry, quite a lot of effort has been put into rabbit recovery since the mid-1990s. This has included attempts to alter land management practices to benefit rabbits and to intervene directly to assist rabbit recovery, with rabbit reintroductions and vaccinations. However, to date these initiatives have not been very effective and extensive, and probably have had little beneficial impact on lynx[85]. This has been due to several obstacles, including a lack of knowledge as to where rabbit recovery is most required, as detailed below.

4.6.1 Establishing where rabbit recovery is required

In order to conduct effective rabbit recovery for the lynx, it is necessary to establish where rabbit recovery is most required. To date this has partly been obstructed by a lack of knowledge as to the state of rabbit populations. This has in turn been partly due to the relative difficulty in conducting rabbit censuses over large areas, which are much harder to conduct than, for example, lynx census. However, it is also because censuses that have been undertaken have been poorly co-ordinated. For example, projects part funded and co-ordinated by the EU in the mid 1990s in five Spanish regions each aimed to research and assist lynx conservation. In particular, each project developed rabbit census techniques. However, because there was poor co-ordination between the five projects, the methods developed were incompatible and it was thus not possible to combine the results to obtain a more general picture of rabbit populations. Technical co-ordination of this and other aspects of lynx conservation has subsequently improved with, for example, better co-ordination of EU funded conservation projects under two new committees currently co-ordinating work within and between projects in Andalucia and Castilla - La Mancha. As a result, rabbit census data is

now more advanced and it is now known where rabbit recovery is most required. However, the poor co-ordination of projects in the 1990s meant that valuable time was lost.

4.6.2 Altering land management to favour rabbits

Rabbits require areas of open grassland to feed. Thus conservation authorities in several Spanish regions, including Andalucia, Extremadura and Castilla - La Mancha, as well as in Portugal, have, since the mid-1990s, been cutting new patches of grassland within previously closed forest areas to re-create a forest-scrub-grass mosaic, beneficial to both lynx and rabbits. This work begun in publicly-managed areas including Doñana National Park and the Malcata Reserve in Portugal, but has since been expanded, including into private estates. Creating areas of grass could probably be very beneficial to rabbit recovery and needs to be expanded into larger areas, which would require extra funding, particularly in the long term. However, it is not yet known if rabbits have responded significantly to improved habitat to date.

So as to gain access to conduct rabbit recovery and lynx conservation work, and to encourage land owners to alter their management practices to benefit rabbits and lynx, various conservation authorities have over the last five years been negotiating new agreements with private land owners. This work has been pioneered by WWF Spain since 1998 and Fundacion CBD Habitat since 1999, the latter building on experience gained with forming land owner agreements to benefit other species, including the Monk Seal in Spain. To date WWF Spain has formed 5 agreements in Montes de Toledo and 5 in Andujar, covering 5,000 and 9,000 ha respectively. Fundacion CBD Habitat has formed 13 agreements with estates in Andujar and 7 in Montes de Toledo. Regional Governments, including in Andalucia, Castilla - La Mancha and Extremadura, have also started to form agreements, and the regional government of Andalucia now has agreements covering 100,000 ha in areas in Doñana and Andujar. In particular, most of the areas where lynx survive in Andujar are now covered by landowner agreements, with the exception of one large hunting estate in the east of Andujar.

Each agreement is a legal contract between the landowner and the conservation organisation stipulating a right of access to conservation personnel, the right of the conservation organisation to conduct certain activities on the private land, and the requirement of the land owner to alter certain activities to benefit rabbits and lynx. In particular, as concerns rabbit recovery, agreements on hunting estates stipulate that rabbit hunting should be reduced or avoided. This is backed up and encouraged by a system of financial payments to compensate for the loss of revenue from reduced commercial hunting, offered by WWF Spain, Fundacion CBD Habitat and some Spanish regional governments. Financial payments are important and have been shown to be effective where nature conservation requires changes in economic activity. However, the Andalucian Regional Government does not yet offer financial incentives for land owners to reduce rabbit hunting[86]. This is problematic because NGOs such as WWF Spain and Fundacion CBD Habitat do not have the resources to maintain or expand their current system of incentives, as would be required to encourage more hunting estates to reduce rabbit hunting, particularly in areas where lynx populations might be expanded or re-created in the future. In general, financial payments and wider land owner agreements may be having a significant impact on land management practices and rabbit recovery, though, as these initiatives only started four years ago and are still developing, it is too early to determine whether this is the case.

4.6.3 Intervening to directly assist rabbit recovery

Conservation organisations and hunting associations have experimented with a number of initiatives to directly assist rabbit recovery, including rabbit reintroductions and vaccinations. However, reintroductions that have been conducted over the last few years have largely been poorly co-ordinated and planned, and thus not very effective. For example, some organisations have released domestic or exotic species, and potentially diseased rabbits – thus hindering rather than assisting rabbit recovery – and have failed to provide adequate protection or food supplies to released rabbits, most of which have not survived long in the wild. Tighter controls and better co-ordination is now in place, particularly under committees co-ordinating EU-funded projects, and the Lynx Working Group, which has created a protocol for when rabbit reintroductions should be undertaken to benefit lynx.

Current rabbit reintroduction projects include protected areas within which rabbits are released, with fences that keep out common predators such as foxes and food competitors such as deer, but allow lynx and eagles to enter. WWF Spain currently manages 4 such sites in Andujar, each covering 5-7 ha , and plans to create 4 more per year until 2005. The Andalucian Government manages 20 sites, each of around 1 ha, and there is co-ordination with WWF Spain to see which size area is the most effective. In addition, these organisations: only release wild rabbits from surrounding areas – to minimise any spread of disease and ensure that released rabbits are of the correct "eco-type" – ;vaccinate all released rabbits, and; provide safe breeding dens, area of shelter and initial food supplies. These methods have the potential to be effective in assisting rabbit recovery, but are too new and not yet extensive enough to have demonstrated a significant impact to date. More learning and funding would be required for them to do so. Rabbit reintroductions will also be assisted by a new rabbit "captive breeding programme" underway at Doñana National Park[87].

In general, there are several obstacles to assisting rabbit recovery. Firstly, there is a lack of knowledge as to the complex interactions between rabbit predators, that combine to suppress rabbit recovery[88]. Secondly, there is not enough knowledge about the dynamics and drivers of myxomatosis and VHP epidemics[89]. Thirdly, and most importantly, there is no effective available method for controlling these diseases. Vaccinations currently used on released and wild rabbits only last 3-6 months and are not transmitted between rabbits and so could never be an effective disease control method over large areas. An experimental new vaccine – LapinVac – has been developed, which is long-lived and transmitted between animals. However, this is unlikely to be licensed for use as it is a genetically modified organism specifically designed to spread uncontrollably. Similarly, there have been suggestions about introducing rabbits from other countries, where natural immunity or less virulent strains of diseases seem to have developed and have allowed rabbit recovery. However, these ideas may never be implemented due to strict and important controls on the introduction of exotic animals and diseases. Thus more innovation is required.

4.7 Lynx supplementary feeding

Because rabbits are unlikely to be recovered in the near future, a number of lynx supplementary feeding projects have been started in the last two years in Doñana National Park, by the Biological Station of Doñana (BSD) and in Andujar, by Fundacion CBD Habitat. The projects in Andujar have been facilitated by the agreements reached with land owners mentioned above. Domestic rabbits, chickens and carrion have all been used and are taken by lynxes. Food is made available at different times of the day to avoid habitualising the lynx, and the fences around the food to keep out other predators – such as foxes – make it difficult

for lynx to enter, thus forcing them to maintain natural hunting skills. Supplementary feeding has been shown to be effective and important with recovering other endangered species in Spain, such as the lammergeyer vulture, and the fact that several individual lynx have already started feeding from the provided enclosures suggests that the current initiatives are having an impact[90]. Supplementary feeding is essentially a short-term emergency measure and will never be sustainable in the long term or address the route causes of food shortage for the lynx. However, it could be very important in helping lynx to survive now, especially if they are already stressed or have young to support, as set out in a new "protocol" developed by the Lynx Working Group in June 2003. The current projects are not very extensive and are mostly "experimental" and would need to be reproduced on a much larger scale if they are to compensate for the current lack of wild rabbits. This would require additional funding to that currently available, and a greater level of agreement and planning, given that there is divided opinion amongst professionals as to the importance and effectiveness of supplementary feeding for the lynx. Moreover, if supplementary feeding is to help lynx outside of Doñana and Andujar, more knowledge is required as to exactly where those lynx survive.

4.8 Reducing hunting pressures

It is important to reduce hunting pressures, because hunting has been the biggest single cause of lynx mortality[91], and because most lynx survive, and will need to be recovered, on hunting estates, because that is where most habitat survives, as described above. Attempts to reduce hunting pressures to date have involved some legal protection of lynx and encouragement of more benign hunting and game-keeping practices. However, these attempts are quite new and not very effective or extensive, and much more could and should be done, as described below.

4.8.1 Legally protect lynx

Legislation protecting lynx includes bans on hunting introduced in 1966 in Spain and 1974 in Portugal, various restrictions and bans on traps and snares, and a complete ban on trading in lynx under the CITES convention. However, lynx continue to be killed accidentally and deliberately by hunters and game-keepers, and illegal use of traps and snares is widespread[92]. This is partly because existing legislation protecting lynx is not as good as it could be. For example, Spain and Portugal have exempted themselves from complete bans on traps and snares proposed by the EU, and continue to licence some trap use[93]. Similarly, laws forbidding the killing of lynx restrict legal responsibility to those actually perpetrating the killing, which is often very hard to prove in practice. It has thus been suggested that legal responsibility be extended to include land owners on whose land lynx are killed, but this has yet to be officially proposed or implemented[94].

Beyond inadequate legislation, however, lynx also die due to inadequate enforcement of the legislation that is available. For example, the Council of Europe has found that administrative controls on predator control are "almost non-existent" and that controls governing trap use are "systematically violated"[95], and many other organisations have witnessed and reported extensive and illegal trap use. This is partly because there is insufficient funding available for surveillance of lynx areas to monitor and avoid illegal trap and snare usage. However, it has also been alleged that there is insufficient political support to challenge the activities of powerful hunting interests, that themselves do receive significant political support.

Hunting is a major, and economically important, land-use in Spain and Portugal. It would thus be unrealistic to expect or aim for a complete prohibition of hunting in actual and potential lynx areas. Moreover, legal mechanisms controlling or prohibiting hunting will always be

limited in their effectiveness, especially in rural Spain and Portugal where a general lack of regard for, and engagement with law enforcement authorities has been reported by several interviewees. In addition, it would not be in the lynx's interests to ban all hunting in lynx areas, as hunting safeguards valuable habitat that might be lost if land owners stop hunting in favour of other land-uses. Thus it is important that conservation organisations aim to alter rather than ban hunting, and encourage as much as enforce changes, as described below.

4.8.2 Encouraging more benign hunting and game-keeping practices

To date attempts at encouraging more benign hunting and game-keeping practices have involved, in particular, the land owner agreements negotiated by Fundacion CBD Habitat, WWF Spain and Spanish Regional Governments, mentioned above. These encourage rabbit recovery – as described above in section 4.6 – but also stipulate the removal of certain types of traps, the abolition of non-selective predator control methods, and the access of conservation personnel to private estates, which increases surveillance and vigilance to ensure that hunting practices do actually improve. This is particularly important, given that before these agreements were created in the last few years, no one – not even government officials – could easily enter and inspect private estates where lynx survive. As with rabbit recovery, it is still too early to say whether these agreements are having a significant impact upon hunting pressures, but there would seem to be a lot of potential for them to do so.

In addition to the land owner agreements, conservation organisations – such as WWF Spain and SOS Lynx - are also starting to get involved with negotiating actual hunting management practices and advising land owners and gamekeepers as to exactly when and where it is most important to avoid hunting, so as to keep disturbance of, particularly breeding, lynx to a minimum. However, a particular obstacle to encouraging more benign hunting practices are the entrenched cultural and social values and views, still held by many, and formed from centuries of persecution of lynx and misguided beliefs that lynx threaten game stocks. Some work has been undertaken – particularly under current EU funded LIFE projects – with outreach efforts, sending leaflets to hunters and hunting associations, backed up by, and reporting, research that has shown that lynx can actually benefit game stocks by controlling more common predators such as foxes. However, much more work is needed, and individuals still deliberately kill lynx, either because they do not know enough or care enough about lynx and lynx conservation. A further barrier to encouraging more benign game-keeping practices, is the lack of an effective, selective rabbit predator control method that allows common predators to be controlled without killing lynx. Thus more innovation is required.

4.9 Creating a captive breeding population

The importance of a captive breeding programme for the Iberian Lynx has been recognised by some organisations for some time, given the precarious state of lynx in the wild. International organisations such as the Council of Europe and the World Conservation Union (IUCN) have advised and supported captive breeding, and, as long ago as 1992, a captive breeding centre was set up in El Acebuche on the edge of Doñana National Park. Breeding facilities have also been constructed at Jerez Zoo, also in Andalucia, and at Los Hornos in Extremadura, and there is an approved plan to construct a breeding centre at Malcata in Portugal. There has been a breeding strategy (since 2001) and a dedicated breeding committee (since 2000). In addition, the staff at El Acebuche, Jerez Zoo and Los Hornos have been gaining experience with rearing Iberian Lynx, North American Bobcats and Eurasian Lynx respectively. However, despite repeated and prolonged calls for progress – including from the Council of

Europe, IUCN, WWF, SOS Lynx and Ecologistas en Accion – and some official assertions that breeding is underway[96], there has still not been a single Iberian Lynx bred in captivity.

The main reason for this impasse, despite all the facilities, planning and funding, has been discord between the government of Andalucia – which legally "owns" all the lynx in Andalucia (from where almost certainly any lynx for captive breeding would have to come), including in the National Park – and the Spanish Government, which manages the Doñana National Park including the El Acebuche Centre. This has prevented National Park personnel capturing lynx in the field and has also prevented captured lynx being transferred to El Acebuche. In addition there have been disagreements between personnel at El Acebuche and the Biological Station of Doñana (BSD: part of CSIC[97]), which studies and monitors lynx and is an official adviser to the breeding programme. Moreover, the programme has also suffered from bad luck in that the few individual lynx that could be acquired from the wild, mainly injured animals or cubs expected not to survive, have mostly happened to be female.

Thankfully things now seemed to have improved. A new Bilateral Agreement was signed between the Andalucian and the Spanish Governments in May 2003, creating a Bilateral Commission to oversee the breeding programme. In addition there has been a change of personnel at El Acebuche with better relations with BSD. This has allowed a male lynx – Garfio – to be captured in Andujar and placed in quarantine in El Acebuche. If he is found to be fit and free from diseases he will be united with already captive females ready for breeding next season and hopefully the first cubs will be produced by 2006[98]. Another young male lynx – Cromo – was recently moved to El Acebuche from Jerez Zoo, and he should be included in the breeding programme when he is old enough. A third male is being held in Cordoba but will probably not be included in the programme as he has a blood parasite. Of the four captive females at El Acebuche only 1 (Esperanza) is of breeding age. One is too old, and the other two (Sali and Aura) are still too young. Moreover, Esperanza has been extensively hand-reared and imprinted on humans and there are doubts as to her ability to mate and rear cubs.

Figure 10: young wild lynx, raised in captivity.

Figure 11: young wild lynx, raised in captivity.

Thus at least 3 more males and 4 more females need to be captured from the wild to create the planned founder population of 12 individuals (5 male, 7 female). This should be possible under the current Bilateral Commission, but further agreements and wider political co-ordination would be needed with other governments if the breeding population is to include centres outside of Andalucia, such as Los Hornos in Extremadura and Malcata in Portugal, as currently planned. No formal agreement exists between Andalucia and Extremadura, or between Andalucia, Spain and Portugal concerning the transfer of animals for captive breeding. Technical co-ordination of captive breeding is now quite good – via the Lynx Working Group, the Lynx Breeding Committee and internationally from the IUCN. However, there is concern that the new political Bilateral Commission, though required in the short term to overcome past discord, might sideline this technical co-ordination in the future and weaken

the effectiveness of the breeding programme, as it does not include governments other than Andalucia and Spain, or NGOs and scientists in decision-making. In addition, there is divided opinion at present amongst experts and conservation professionals as to the role, importance and urgency of a captive breeding programme. There has not been enough agreement and common strategic planning between stakeholders on these matters, and this is required.

4.10 Reintroducing lynx

No reintroductions of animals bred in captivity into new areas have been undertaken with the Iberian Lynx, principally because a captive breeding population has yet to be created. However, there is also a lack of the required planning, agreement and long term funding that reintroductions would entail. Moreover, the areas into which animals would be reintroduced in the future have yet to be decided and designated, let alone adequately protected and restored with suitable habitat, rabbit populations and low human disturbance. In addition, reintroductions of Andalucian animals into other regions and Portugal would currently be obstructed by a lack of adequate political co-ordination and agreement between governments.

4.11 Translocating lynx

Some lynx have been caught from and reintroduced to the wild. However, this has been primarily to study the animals and to recuperate and release animals that have been injured. No translocations have been undertaken between the two remnant populations to increase genetic diversity. Similarly, no lynx have been translocated from the remnant populations into new areas to create new populations. Again, as above, this is partly because no areas have been prepared or designated for the creation of new populations. However, it is also because there is little agreement, let alone strategic planning, as to the future role of translocations.

There is an official study into the viability of translocating lynx into the Sierra de Cadiz in Southern Andalucia[99]. However, some conservation professionals feel that it may be better to translocate animals closer to the present distribution and others feel that it would be more important to translocate animals to areas outside of Andalucia, such as Extremadura, Castilla - La Mancha or Portugal, where habitat and rabbit availability maybe more preferable. Similarly, there is some divided opinion between professionals who are eager that translocations should start immediately – to gain expertise and results – possibly using dispersing lynx who may well die young otherwise, and those who are more cautious and feel that avoiding any loss in genetic diversity to the donor population should be paramount.

There are currently discussions between Spain and Portugal as to the possibility of translocating animals from Spain for soft-release in Portugal, but not as yet any formal agreement, which would be required to allow funding to be sought and the project to proceed. In general, as with reintroductions, translocations would currently be obstructed by a lack of funding and political co-ordination, particularly if Andalucian animals are to be translocated elsewhere. In addition there is still a strong requirement for bureaucratic and political permission to carry out translocations - because they are still perceived as “special”, and a possible threat to the survival of wild populations - which would thus need to be overcome by political pressure and experience showing translocations can be done effectively and routinely, to help conservation, as has been the case with the Eurasian Lynx[100].

4.12 Protecting lynx from infectious disease

To date, at least two lynxes are known to have died from Tuberculosis (TB). In addition, several of the lynx captured for the captive breeding programme, or because they are injured, have been found to have health problems. All dead lynx that are discovered are subject to an autopsy at El Acebuche in Doñana. However, there has not to date been any concerted effort to research and monitor disease problems in wild lynx populations, let alone address any of the problems that might be discovered. This is probably partly due to a lack of resources, but it has also been suggested that some authorities and organisations may not want to have the bad news that disease monitoring might bring. Moreover, if, for example, TB were discovered to be extensive in wild lynx, this would require that the animals that have introduced TB – allegedly domestic cattle in Doñana National Park – be removed from the area, which is likely to be obstructed by the same powerful local agricultural interests that allegedly pressured the conservation authorities into accepting more cattle in the National Park in the first place.

4.13 Rehabilitating injured lynx

In line with recommendations from the Council of Europe, and building on experience with other species, a dedicated lynx recovery centre has been established in recent years at Cordoba in Andalucia, managed by the Andalucian Regional Government. This has probably been one of the most effective and important initiatives, that has actually benefited individual lynx and possibly assisted population survival. To date several injured animals have been captured, rehabilitated and released back into the wild. This is particularly important given the low overall number of lynx in the wild and that they are still subject to numerous causes of injury – from traps, vehicles and other animals – that, if not treated, would probably be fatal. The Cordoba centre has also been important in supplying animals for the captive breeding programme, and this is likely to continue in the future.

4.14 Obstacles

This report has found that progress towards the required conservation actions, as described above, is NOT CURRENTLY being obstructed by the following factors:

- The level of scientific understanding about the lynx and its decline.
- The level of international technical support for lynx conservation.
- The level of political and public support for nature conservation in general.
- The level of technical co-ordination of lynx conservation.
- The level of short term funding available for lynx conservation in Spain.
- The level of commitment by conservation professionals

However, progress in lynx conservation IS CURRENTLY being obstructed by:

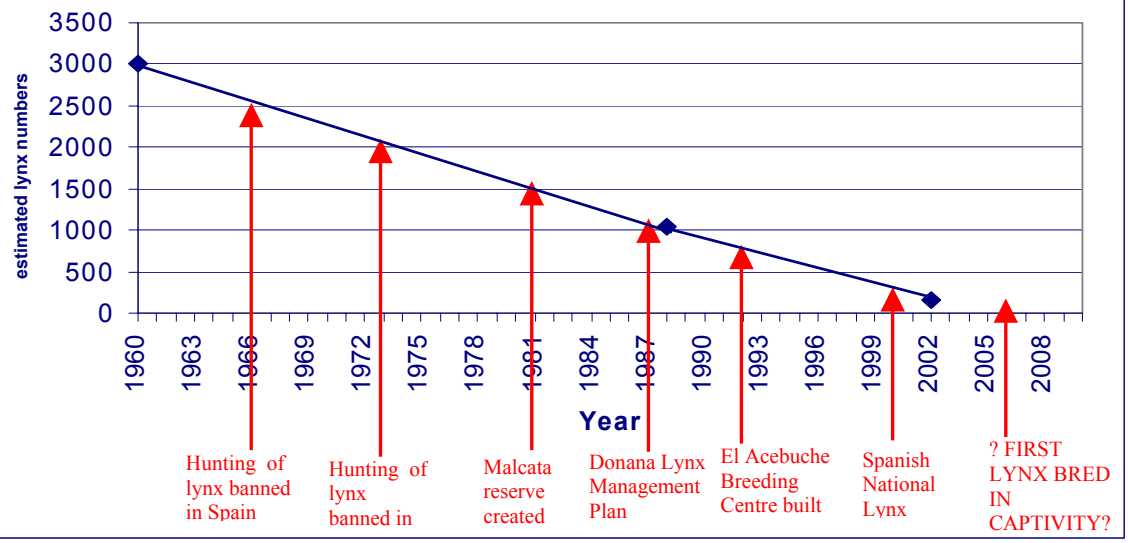
- Insufficient and patchy political support for lynx conservation
- Insufficient and patchy public support for lynx conservation

- Infrastructure and land-use policies that contradict lynx conservation
- Inadequate legislation to protect lynx and lynx habitat
- Insufficient incentives for habitat and lynx protection on private land
- A lack of long-term funding for lynx conservation in Spain and Portugal
- A lack of short-term funding for nature conservation in Portugal
- Insufficient innovation in rabbit vaccines and selective predator control.
- A lack of common long-term strategic planning in lynx conservation.
- Insufficient political co-ordination of conservation between regions and institutions
- Insufficient research of rabbit disease dynamics and rabbit predator interactions.
- Insufficient monitoring of lynx, lynx mortality, lynx diseases and rabbits.

4.15 Conclusion

Progress towards implementing the required conservation actions started late, is patchy and has developed slowly. Moreover, those initiatives that have been undertaken to date, seem to have had little impact in slowing, let alone reversing, the decline in the Iberian Lynx, as shown below. To date there has been no lynx bred in captivity, no translocations or reintroductions and little success with rabbit recovery, protecting lynx from introduced diseases and reducing hunting and road kill pressures. Some progress has been made in habitat conservation and restoration, supplementary feeding and rehabilitating injured lynx, though much more work is needed. Much more could and should be done, and there is still a chance to save the lynx. However, there are a number of political, financial, legal, social, scientific and technological obstacles that would still need to be overcome to progress with conservation. How this might be achieved is considered in the next chapter.

Figure 10: Lynx decline and some key conservation milestones



5. What needs to change

The Iberian lynx is in an emergency situation. It has declined rapidly and extensively to the fewer than 200 individuals that now remain, and it is very possible that even these few animals may disappear in the next few years. Moreover, although the lynx is endemic to two countries in the European Union – one of the mostly wealthy, scientific and, supposedly, environmentally-friendly areas of the world – the conservation response to the lynx decline is quite new and still not very extensive. Thus a lot needs to be done to save the Iberian Lynx, but it seems unlikely at present that the conservation effort will act quickly enough, or on a large enough scale, to achieve this, unless significant changes are made, as described below.

5.1 A long term common strategy in lynx conservation

Personnel from various governmental, non-governmental, international and scientific organisations already involved with lynx conservation are probably those best placed to know what needs to be done to recover the lynx and how best to achieve it. Similarly, they are the ones who will need to implement conservation actions and thus agree with and not work against each other. However, there is some divided opinion and lack of agreement between these personnel as to, for example, the required and most appropriate distribution for a future metapopulation, and the importance, effectiveness and urgency of a number of conservation actions including: translocations, captive breeding, reintroductions, supplementary feeding, and payments to land owners to alter management practices. There is now quite good technical co-ordination of projects and between organisations. However, most planning to date has focused on the short term and has not provided detail on some required actions. Thus there is a need for more common, long-term strategic planning.

In particular this would be to:

- Provide an agreed, common long-term plan to sell to politicians, the media and the public, to raise both political and public support for lynx conservation.

- Make sure that all current conservation projects are compatible with the longer term needs of lynx conservation, and are not counter-productive.

- Make sure that everything that is needed for the long term survival of the lynx is urgently undertaken, and that no opportunities are missed.

- Provide a robust and unified defence of the lynx and its habitat, particularly in opposition to on-going threats and pressures for unsustainable development.

A suitable long-term strategic plan might include the actions outlined in Chapter 3, and in other action plans, such as that endorsed by the Council of Europe[101]. However, much more detail would be required in terms of timetables, funding and, in particular, the desired and appropriate location and distribution of a recovered lynx metapopulation. This plan would need to be agreed and committed to by as wide a variety of stakeholders as possible, including the EU, campaign groups, regional and national governments (including ministries responsible for agriculture, forestry and public works), conservation professionals and scientists. In addition, the plan would require overcoming disagreements and divided opinion that still exist as to the importance and urgency of particular conservation actions, as well as the lack of political support that has held up the approval of lynx recovery plans to date.

Given the urgency of the situation, and the need to involve a wide variety of organisations, a new 'vision conference' would be particularly useful to instigate a long term strategic plan. To date WWF, the IUCN and SOS Lynx have all professed a keen interest in such an initiative. A number of conferences have been undertaken to date focusing on the Iberian Lynx, and have been important in encouraging progress in particular aspects of lynx conservation, as detailed in the Appendix. For example, the Andujar Conference in 2002 helped to overcome political disagreements holding up the captive breeding programme, and raised awareness as to the dire situation of the lynx in the wild. Similarly, a 1999 conference led directly to the lynx breeding plan. However, there has not yet been a conference focusing on the long term strategy for lynx conservation in general. Such a conference would need to be as inclusive and balanced as possible, and not be perceived as, or become, too partisan, or biased towards any one particular organisation or perspective. It would also require funding, preparation and leadership. Most importantly, it is important that this conference is not just a "talking shop", but actually produces a long term strategy that is urgently implemented. This will require subsequent monitoring and enforcement. There is currently a fledgling international committee on lynx conservation – formed in 2003 between the Council of Europe, World Conservation Union and Large Carnivore Initiative for Europe – which might be expanded with other stakeholders, and empowered, to fulfil this role

5.2 Innovation

To date, some innovation has been achieved of importance to lynx conservation, including the use of new camera traps in conjunction with a lynx urine lure for effective lynx monitoring, and the design of special enclosures for lynx supplementary feeding. However, more innovation is required, particularly in techniques for reintroducing rabbits, requiring continued learning and experimentation by, and consultation between, those organisations and individuals involved. In addition, innovation is required to produce an effective, long-lived rabbit vaccine, against both rabbit diseases, that is not a genetically modified organism, so that it can be released and licensed for use. Similarly, there is a need to develop predator control techniques that allow gamekeepers to effectively control common rabbit predators without killing lynx. Encouraging such innovation will require political support and funding.

5.3 More monitoring and research

Monitoring and research has played, and will continue to play, an important role in lynx conservation. Historically, a lack of scientific knowledge about the lynx held up conservation. In the last 15 years increased knowledge has facilitated and, in part, driven conservation. However, there are still specific areas of scientific uncertainty and ignorance that are obstructing progress in lynx conservation, and that need to be addressed, as described below.

5.3.1 Distribution and number of lynx outside of Andujar and Doñana

Knowledge of lynx distributions is important to direct conservation actions and, in particular, to ensure that current lynx areas are provided extra protection. Techniques for monitoring lynx have recently been improved. Previous techniques relied upon interviewing individuals who had claimed to have seen lynx to assess their reliability. However, these may have been inaccurate and subjective, and were hard to repeat. These have now been replaced by camera trap surveys, which overcome the difficulty of seeing lynx and lynx footprints in dry, rocky,

extensive and forested Iberian environments, and by DNA tests on hair and excrement samples, which overcome the difficulty of distinguishing samples from those of wild cats.

At present camera trap surveys and collection of samples for DNA testing, is carried out particularly in Portugal, Extremadura, Castilla - La Mancha and Andalucia. There is now quite good technical co-ordination between the various governments, NGOs and scientific institutions involved, and results are being used to continually update the 2002 census, and – in Andalucia – to build up a catalogue of individual lynx. In addition, new monitoring techniques, involving digital photography and computer analysis of footprints, currently being developed[102], may also help improve and speed up lynx monitoring. However, the current levels of monitoring have not been going long enough and are not extensive enough to provide a definitive and accurate picture of lynx presence, particularly outside Andalucia. Moreover, even if a more accurate picture could be produced this may still not be enough to satisfy sceptics on both sides of what has become quite a politicised debate and controversy.

Some conservation campaigners, that genuinely want lynx to survive, and that may want to use lynx presence to justify protecting other species, have at times rejected and not accepted survey results suggesting that lynx may have gone extinct from particular areas. Conversely, some developers and politicians, that may not want lynx presence confirmed in an area as this would prejudice planned development and possible vested interests, have not accepted, and may even have with-held[103], some studies and survey results that suggest lynx presence. Moreover, demonstrating that there is lynx presence in an area will be key to pressuring Spanish Regions to approve and implement lynx recovery plans: a legal requirement that is removed if lynx are confirmed extinct in a region[104]. Thus there is quite a high burden of proof and pressure on those conducting surveys, and an even greater need to ensure that surveys are as accurate and extensive as possible, requiring additional funding and political support.

5.3.2 Current rates and causes of lynx mortality

Knowledge of current rates and causes of lynx mortality is important and required to assess the effectiveness of current conservation projects and identify any current causes of mortality that are not yet being addressed, potentially, for example, disease and high speed trains. At present any lynx found dead are taken to El Acebuche for autopsy. However, many dead lynx are not found as they may die in dense and extensive areas of vegetation. Lynx mortality can be accurately surveyed using radio collars, as was undertaken by CSIC in the 1980s and 1990s in Doñana, which proved very effective at highlighting the rate and causes of lynx decline. However, there has not been any comprehensive survey of lynx mortality rates and causes in wild populations since 1997, and seldom outside of Doñana, partly due to difficulty for researchers to gain access to private estates, particularly in Andujar[105]. CSIC may do more such surveys in the future. However, given the importance and urgency of acquiring this knowledge it seems necessary that other organisations urgently undertake radio collar surveys, ideally on all lynx in Andujar, Doñana and elsewhere. New landowner agreements, as described in section 4.6, will help to allow researchers to gain access to private areas. However, funding, and political support are also required. There may also be a number of obstacles that would need to be overcome, including concerns for animal welfare and beliefs that radio collars are un-natural and intrusive. However, experience to date has shown that radio collar surveys can be undertaken without harming lynx and can provide information valuable to the survival of the species.

5.3.3 Levels of disease in wild lynx populations

Beyond knowledge of lynx mortality, it is also important to know the prevalence of disease in wild lynx populations, which may or may not be causing significant mortality, as a first step to addressing and reducing such disease. Disease is expected in lynx by some experts, given low genetic diversity and exposure to potentially diseased domestic animals. Moreover, disease, including TB and blood parasites, has been detected in lynx captured for rehabilitation and captive breeding. However, there has not yet been any comprehensive surveys undertaken of lynx disease in wild populations. Experts suggest that this would be possible but would require additional funding and personnel, and could be obstructed by officials that may not want to receive bad news or criticism of land management practices.

5.3.4 Rabbit ecology, distribution and disease

Given the importance of rabbit recovery for lynx conservation, and current inadequate knowledge in rabbit ecology, distribution and disease[106], more research is needed in these areas to assist lynx conservation. In particular, research has not yet been reported but is needed on the complex interactions between rabbit predators, and the dynamics of rabbit diseases[107], knowledge of which at present is mostly based on anecdotal evidence. Moreover, there is still a need for more rabbit census research, to gain a more accurate picture of where rabbits do and do not survive, and their densities, which would be important in directing and assessing the effectiveness of conservation projects. This will be quite hard to achieve – as rabbits are not easy to survey – and will require additional funding, innovation and learning by those professionals and scientists currently engaged in rabbit recovery work.

5.3.5 Public attitudes towards lynx and lynx conservation

The level of support or hostility of sectors of society towards lynx and lynx conservation, and levels of understanding of the key issues, is not currently known beyond anecdotal evidence. Moreover, this information would be useful to direct and assess outreach efforts, particularly those directed at the rural and hunting communities. Surveys have been suggested[108] and could be undertaken, but would require additional funding and political support.

5.4 More funding

Quite a lot of funding is currently available for lynx conservation, possibly more than for any other single species in Europe[109]. Funding comes from a variety of sources including the EU, national and regional governments, NGOs and private companies. However, current funding is still inadequate, is patchy – with lynx conservation in key areas such as Portugal not being adequately funded – and is not secured beyond the short term. In particular there is concern that just when more funding is needed to cover larger areas – particularly within the Natura 2000 system – and to implement several new projects – such as lynx translocations – there is the possibility that funding may be reduced rather than increased from current levels.

Even short term funding for lynx conservation, including for habitat protection, is not currently available in Portugal, given a general government budget crisis, and previous poor administration and use of LIFE projects such that recent LIFE applications have been unsuccessful. A lack of funds is not holding up lynx conservation at present, simply because few lynx conservation projects are underway. However, planned and important lynx conservation projects, might require funding as early as next year. Due to the unavailability of

funds, some NGOs are approaching international bodies, such as Flora and Fauna International, for funding for lynx conservation[110]. However, given the need for extensive and expensive initiatives, including in government managed areas, official funding will also be required. It is unrealistic to expect the current national budget crisis or problems in the bureaucratic framework, to be overcome swiftly, or for the sake of lynx conservation, and thus funding will probably need to come from outside Portugal, principally from the EU, but directed specifically at those agencies that would be implementing conservation actions, to ensure that funds, and thus results, are not held up by the bureaucratic machinery.

Long term funding is required in both Spain and Portugal, in particular in the following areas:

- extensive rabbit recovery work
- increased surveillance of lynx in hunting areas
- translocations, reintroductions and captive breeding
- extensive lynx supplementary feeding
- extensive habitat restoration and protection
- extensive, sustained lynx monitoring

Current funding, however, is mainly short term (and then only in Spain) and via the two LIFE projects, which will only run until 2006. The lack of longer term funding is understandable, given the need to audit and control funds, the inevitable current focus on the short term survival of the lynx, and the fact that the lynx may not even survive into the longer term to be conserved. Moreover, there is of course the possibility that current funding would be extended in the future, if required. However, without secure longer term funding, organisations are finding it hard, to plan, let alone implement, longer term projects, and even short term projects are affected by more expensive loan financing, and the lack of a guarantee of continuity into the longer term. Some of these problems are probably unavoidable, though there would seem to be scope for, particularly, the EU to pledge that current levels of funding will be maintained and expanded in the longer term, and not be allowed to fall, just when it is most needed for the hoped success of, and the need to build on, current conservation projects. In particular, long term funding should be arranged particularly for rabbit recovery and habitat conservation work, which have wide conservation benefits – beyond the lynx – and will be required in the long term, whether or not the lynx survives. National budgets, even in Spain, are very limited. However, there is also the concern that even current EU funding for lynx conservation may reduce in the near future, given the entry of new countries into the EU and the probable increase in funding applications for nature conservation that this could bring.

5.5 Greater political co-ordination of lynx conservation

To date there have been some problems with political disagreements between regions and institutions holding up lynx conservation, in particular captive breeding. Moreover, in the future it is expected that political disagreements might obstruct attempts to:

- create a multi-centred captive breeding population
- translocate wild animals from Andalucia into other regions and Portugal
- reintroduce captive animals from Andalucia into other regions and Portugal

Problems have arisen, and are likely to continue arising, mainly because regions and institutions involved in lynx conservation have little prior experience working closely together on a political level. This in turn is partly because the system of autonomous regional

government in Spain is quite new, and there has been relatively poor historic political relations between Spain and Portugal. Thus, any political co-ordination created for lynx conservation has little precedent.

The problems of political discord holding up lynx conservation are not intractable. Moreover, some progress has already been made with the creation of a Bilateral Commission between Andalucia and Spain to oversee captive breeding, as described in section 4.9. However, to date, little progress has been made in creating wider political co-ordination involving other regions, and Portugal, and concerning wider issues than just captive breeding. There is now quite good technical co-ordination between governments, NGOs and scientists – via a number of committees – which is important and necessary. However, this is not sufficient to implement policy – as technical committees have no political power – and technical co-ordination has been held up by a lack of political co-ordination, and is likely to continue being so unless political co-ordination is increased.

Steps are now being taken to develop new agreements between, in particular, Spain and Portugal as regards the possibility of translocating lynx between the two countries. However, there has still not been a formal agreement. Moreover, if the Andalucia-Spain experience is used as a model, it seems likely that a permanent political commission will be required between these and other governments, to deal with and focus on the political complexities of, and obstacles to, lynx conservation. This commission would compliment rather than replace or frustrate technical co-ordination, and might be formed by expanding the existing Bilateral Commission to include more regions and institutions, and to consider wider issues.

5.6 Increased public support of lynx and lynx conservation

In order to conserve and recover the lynx, a high level of awareness of and support for the lynx and lynx conservation will be needed across Iberian society so that individuals:

- pressure and lobby policymakers and politicians for action
- accept compromises in other policy areas
- alter their own actions to accommodate lynx

Quite a lot of people, particularly in Andalucia, are now aware of the lynx and that it is in danger of extinction, and public knowledge and awareness of the lynx has risen significantly over the last 15 years. However, knowledge of the particular threats to the lynx and what would need to change in order to save it from extinction, is more limited and insufficient, and public awareness is some areas, such as Portugal, is lower than in others. Moreover, regard for the lynx is probably higher amongst urban than rural populations - as is also the case with the Eurasian Lynx in the Alps[111] - whilst it is rural populations who have more of a direct impact on the lynx, e.g. through hunting, agriculture and development pressures.

Education and outreach campaigns have been started by both NGOs and governments, targeted particularly at those living in lynx areas, and hunting groups. For example, Ecologistas en Accion now regularly visit and give presentations to schools, including games and competitions centred around the lynx. Similarly, WWF Spain, Fundacion CBD Habitat and the Junta de Andalucia, in conjunction with some hunting associations, have developed and distributed a number of leaflets aimed at convincing hunters and gamekeepers to alter their activities and accept that the lynx can actually be a bonus, rather than a burden, given its control on more common rabbit predators. In addition, there is now some contact between conservation professionals and hunters and gamekeepers, particularly given new land owner

agreements, allowing more exchange of knowledge and understanding about lynx. Such initiatives are important, and in the longer term will probably be one of the most important aspects of the conservation effort. However, the continued evidence of lynx deaths from deliberate shooting and trapping in both Andujar and Doñana confirms that outreach campaigns still have a long way to go to overturn decades-old prejudices and persecution of the lynx. More and sustained education and outreach campaigns will require additional funding and would benefit from research into public attitudes, as described in section 5.3.

Additional methods of outreach already undertaken include the "Andalucian Pact", which has been promoted by the regional government and NGOs, and signed by over 14,000 people[112], calling on everyone in Andalucia to work together "to avoid the disappearance of the lynx and the pride and satisfaction of conserving it in our territory". Public support for, and awareness of, the lynx is also promoted via the various official visitors centres at National and Natural Parks, though these tend to reach more tourists than locals.

The Iberian Lynx is a beautiful, quite large creature, and thus it should be easier to raise significant public support for its conservation, than for the conservation of smaller, and less beautiful species. However, a particular barrier to raising public support is that the lynx is quite elusive and hard to see in the wild. Thus, even those people living in lynx areas rarely see lynx, do not have a strong attachment to lynx, and do not necessarily miss lynx when they are gone. Thus the mass media is particularly important in highlighting and demonstrating the beauty of the animal, to raise public awareness of, and support for, lynx conservation.

Some media coverage has been given to the lynx to date. This includes, in particular, the 1981 documentary "the Last Lynx" shown in Spain, a 2003 documentary shown in Portugal and increasing references in news broadcasts and wildlife programmes. However, the lynx should still be given a higher profile and there is still very little lynx video footage widely available or transmitted in the media. The Spanish Environment Ministry has recently obtained stock footage of lynx at the El Acebuche centre in Doñana, which will hopefully be widely disseminated from now on[113]. In order to obtain more footage of wild lynx, film-makers and photographers will need to be granted access to film lynx in the wild, under appropriate controls. However, recently, even respected and well-known photographers have not been able to gain access to Doñana National Park or private estates in Andujar to film lynx. It has been alleged that this is because land managers may not want outsiders to witness management practices that may not be as good as they could be.

It is not surprising that some people should resent (and even persecute) lynx, and fail to support lynx conservation, if lynx presence brings about tighter controls on development without also providing extra financial reward to land owners, as is currently the case. Thus, beyond increasing the profile of the lynx in the media, and maintaining and expanding current outreach and environmental education efforts, increased public support for lynx conservation will also require changes in government land-use policies, to financially support and actively promote and encourage development compatible with lynx, as described in sections 5.8 and 5.9. In addition, benefits that exist from having lynx need to be more widely promoted.

5.7 Stricter legislation

Some legislation has been created that has assisted lynx conservation. Examples include the EU's 1992 Habitats Directive and legislation in Spain and Portugal banning lynx hunting and mandating lynx recovery plans. However, existing legislation has not been enforced as much as it could or should have been, and as a result Natura 2000 areas have still to be finally

approved, lynx are still killed by hunters, and most Spanish regions have still to approve a lynx recovery plan. Greater enforcement of existing legislation would require, in particular, additional political support as described in section 5.10. Moreover, there are also a number of inadequacies in current legislation that need to be addressed to help save the lynx.

Lynx conservation would be facilitated in particular by:

- **stricter legislation concerning Environment Impact Assessments (EIAs);** to ensure that EIAs are required for all developments that threaten lynx and lynx habitat, and that when undertaken, EIAs adequately consider the needs of lynx conservation.

- **new legislation stipulating that land owners are responsible for lynx killed by traps and hunters on their land;** as proposed by Council of Europe in 2000[114].

- **stricter legislation prohibiting the use of traps and snares;** in particular Spain and Portugal should be pressured to remove their exemptions from EU legislation.

- **stricter legislation governing development in Natura 2000 areas;** in particular the EU should review and revise the Habitat's Directive in light of a number of cases where development has been permitted in Natura 2000 areas that threatens lynx.

Creating this legislation will require time and political support. However, it will be important, particularly to the long term survival of the lynx, and, in the case of Natura 2000 and EIA legislation, to many other species and aspects of environmental protection.

5.8 More incentives for nature conservation on private land

Habitat conservation and restoration, and rabbit recovery, will all require incentives to the owners of private estates, where most lynx survive, and where most management practices are determined by financial considerations. This has been widely recognised, including by the Council of Europe[115]. However, financial incentives for nature conservation on private land in Spain and Portugal remain inadequate. In particular, the Regional Government of Andalucia still does not offer payments to landowners to reduce rabbit hunting and there has not been a substantial increase in incentives to mirror the increased need for nature conservation under the Natura 2000 system, which may cover over 25% of Spain, mostly on private land. Some progress has been made with non-financial incentives, including Royal prizes given to some "lynx estates" in Spain. However, financial incentives are likely to be more important, and need to be increased. This might involve increased funding, though a lot of incentives for nature conservation might be created by re-directing existing subsidies away from policies and developments that threaten endangered species, as described in section 5.9.

5.9 Compatible Infrastructure and land-use policies

Current land-use and infrastructure policies fundamentally contradict lynx conservation. This is true at the regional level, where, for example, the Junta de Andalucia is actively promoting intensive agriculture in known lynx areas around Doñana, at the national level, where, for example, the Spanish Ministry of Works is proposing new motorways that would threaten the survival and expansion of the Andujar population, and at the EU level, where Structural Funds have been made available for, and have facilitated and promoted new dams and roads that have destroyed lynx habitat and killed lynx. Given these contradictory policies, and

despite some but limited progress in lynx conservation, governments at the regional and national governments, and the EU, continue to have a net negative impact on the lynx.

Land-use and infrastructure policies will need to be altered to save the reputation of the EU and governments, and the lynx itself. If these policies are not changed, it will be very hard to save the lynx even with tighter controls on specific development projects and more political support for lynx conservation. This is because development policies will probably always receive more political support than conservation policies, and where policies contradict it will be the less well supported – i.e. conservation – policy that has to be compromised. Similarly, once a particular development project is proposed by official policies, it is often too late and too difficult to significantly alter it, even with stricter controls on particular developments. Likewise, the effects of many projects need to be considered together, at the policy level, rather than in isolation. Moreover, if official policies do prevent the conservation of the lynx, and thus lead in part to its extinction, governments will be unable to escape the blame and shame of having directly contributed to the first loss of a big cat species in modern times.

Fortunately, there are many opportunities for altering current policies to make them more compatible with lynx. Economic development, health and prosperity can be provided for without degrading the natural environment, destroying lynx habitat or killing lynx. Specifically agriculture policies could be made much more sustainable and compatible with lynx, particularly because much agriculture in Spain and Portugal used to be this way until very recently. This would require more fundamental changes in the way that agricultural subsidies are provided, particularly under the Common Agricultural Policy of the EU, greater recognition in official policies as to the importance and effectiveness of traditional farming practices, and increased marketing and promotion of sustainable agriculture products, including under a "lynx label"[116]. Similarly, sufficient water supplies could be provided to the vast majority of the population in Spain and Portugal, without constructing many new dams, not least because water conservation measures are improving, and being very effective at reducing water demand, particularly in the big cities. Likewise, as described in chapter 4, several of the current and proposed roads, problematic for the lynx, are simply not needed to provide adequate freedom of movement to most people in Iberia.

Changing land-use and infrastructure policies will require changing the way that policies are formulated. It has been widely reported that national and regional governments in Spain and Portugal are strongly influenced and pressured by construction lobbies and other powerful interests, such that some projects have been built mainly for the interests of powerful elites, rather than for wider benefits, and in spite of wider losses, including to the natural environment. Similarly, in several cases, lynx and other conservation experts – including government experts - have either not been consulted on key development policies and projects, or if they have been consulted, their views have not been influential[117]. Thus the influence of particular powerful elites will need to be more widely exposed and challenged, and the views of conservation experts and others more widely listened to and empowered[118]. This will require greater media attention, and more political and public support for lynx conservation in general, along with a fundamental change in power politics.

5.10 Greater political support for lynx conservation

A lot of political support is required for lynx conservation, possibly even more than for the conservation of many other species. Firstly, this is because so much needs to be changed, including – not least – rapid economic development, so that habitat is restored rather than fragmented or destroyed. Secondly a lot of the conservation actions require overcoming

bureaucratic inertia and making institutions and regions work together, that may not be very accustomed to doing so, which in turn requires strong political support. Thirdly, there is little time left to act, as the lynx is already close to extinction. Thus strong political support is required to create momentum and ensure that actions are rapidly planned and implemented.

To date, politicians and governments have provided some support to lynx conservation. This includes, for example, quite a lot of funding and personnel for conservation projects, the Andalucian Lynx Pact (signed by the President of Andalucia) and various appearances of politicians on television in support of particular lynx conservation projects, particularly captive breeding. For example, in January 2004, the EU Environment Commissioner and Spanish and Andalucian Environment Ministers, made a high-profile visit to the El Acebuche breeding centre. However, political support for lynx conservation has tended to exist more in the media than in reality, has tended to focus more on captive breeding than *in situ* conservation (as has been found to be the case with some other species[119]), and has been relatively absent from certain key areas, including the need to change development trajectories to avoid habitat loss and new fast roads in lynx areas. For example, both of the main political parties in Spain supported significant expansions to the road network, including through potential lynx areas, in the run-up to the recent general election.

In general, more political support is still needed in particular to:

- ensure existing legislation protecting lynx and habitat is adequately enforced
- ensure that drafted recovery plans, and any new plans, are approved and implemented
- ensure that sufficient Natura 2000 areas are approved and protected
- enable long term funding of lynx conservation to be secured
- change development policies to make them compatible with lynx conservation
- provide sufficient incentives for nature conservation on private land
- reject a number of current development proposals that threaten lynx and lynx habitat
- convince individuals that they should change their actions to conserve lynx

Political support to date has been inadequate for a number of reasons. Firstly, lynx conservation was overlooked even by many conservationists, at least until quite recently, and public support for significant changes to conserve the lynx remains quite low. Secondly, lynx conservation will never be an election issue, unlike, for example, economic development. Thirdly, strongly supporting lynx conservation will require politicians to challenge some quite powerful and currently influential groups, including construction and hunting lobbies. Nevertheless, there is still quite a lot of potential to increase political support at present.

Ironically, although it is bad for the animal, the current critically endangered status of the lynx helps in raising political support for lynx conservation. Many environmental and conservation problems are necessarily long term, with failure to act in the short term having repercussions in 10, 20 or 100 years, well beyond the next election and when many current politicians may no longer be in power. However, as the lynx is now – unfortunately – critically endangered, this does, at least, increase the pressure on current politicians, as there is a real chance that the lynx could go extinct whilst they are still in power, meaning that they might be the ones to attract criticism and blame. Conversely, there is the opportunity for current politicians to gain good publicity in the short term by acting decisively now to allow the lynx to survive.

Raising political support, like public support, is also helped by the lynx being a beautiful and "emblematic" species, and by a number of wider gains for supporting lynx conservation. For example, lynx conservation will require conserving large areas of habitat and recovering

rabbits, which, if achieved, will help many other endangered species, as well as the hunting industry. Similarly, if Portugal and Spain successfully conserve the lynx, their politicians would be able to claim – unlike those in other countries such as the UK – that they have successfully conserved a top carnivore and thus deserve to be regarded as "environmentally-friendly". This might be particularly important for the region's tourist industry.

Politicians in Spain and Portugal are quite sensitive to international attitudes and pressure, not least because governments rely heavily on funding and support from the EU. Thus there is quite a lot of potential for international organisations to pressure Iberian governments for change. To date, some achievements have been made. For example, WWF International – using its Panda Passport campaign – and the IUCN and Bern Convention, were instrumental in encouraging greater political support for, and less discord as regards, lynx breeding. However, more could be done. WWF International is currently considering making the lynx a "regional flagship" species, which could increase its profile and political support in the international community. However, this remains to be decided. Similarly, the EU has applied some pressure on Iberian governments to do more for the lynx. However, the EU's net influence to date has been negative rather than positive, as discussed in the next chapter.

To date, the main drivers for increasing political support have been campaign organisations in Iberia, including Ecologistas en Accion, WWF Spain and La Raya in Spain and the League for the Protection of Nature and SOS Lynx in Portugal. These organisations have had some success in sufficiently raising political support to make changes to benefit the lynx, including campaigns leading to the creation of the Malcata Reserve in Portugal, the avoidance of planned development of the coast of Doñana, progress with the lynx breeding programme and the creation of the Monfrague National Park in Spain's Extremadura. However, most of these organisations are hampered in their work by the need to rely heavily on part-time volunteers and by alleged secrecy within, and some misleading statements from, governments. For example in April 2003, the EU commission in response to pressure and criticism from campaign groups, and its own MEPs claimed that "a captive breeding programme is currently underway" and that "personnel have been efficient in preventing the use of illegal hunting practices"[120]. Both these statements are misleading. There has still not been a single lynx bred in captivity, illegal trap use is still widespread and even the Council of Europe has recognised that controls on hunting are not efficient or effective[121]. Thus officials need to be more open about the situation, and engage with, rather than mislead campaigners. In addition, as discussed above, successful campaigns would also be assisted by greater common strategic planning amongst conservationists.

Legal action against governments and the EU is one opportunity available to NGOs to increase political support for lynx conservation in general and as regards particular aspects of lynx conservation, such as the need to avoid certain development proposals and to strongly control hunting. For example, Ecologistas en Accion have filed legal challenges against a lack of control of snares and the proposed Toledo-Cordoba motorway, WWF Spain filed challenges against Breña II dam and the Villamanrique-El Rocio Road, and SOS lynx has also challenged the Toledo-Cordoba motorway, and has filed a challenge in the European Court of Justice against several governments for a failure to conserve lynx. These challenges have helped to raise the political profile of the lynx, but have not yet stopped certain proposals.

In general, raising political support that actually benefits lynx conservation could be obstructed by the potential misuse of the lynx issue. For example, there is some concern amongst lynx experts that some politicians are using the Iberian Lynx to gain public and financial support for projects that may have little benefit for the lynx. Similarly, there is also

concern that some NGOs may be using the lynx to gain support for stopping developments that may have little impact on the lynx, which risks detracting political support for campaigns against development that are a very real threat to lynx. Whether or not these concerns are well founded is unclear. However, the fact that there is some suspicion means that there is a need for more common and transparent strategic planning between stakeholders to determine the long term direction and priorities in lynx conservation, as described in section 5.1.

5.11 Conclusion

Successful conservation of the Iberian Lynx will require a number of changes to overcome obstacles identified in Chapter 4. These changes include: more funding, political support and political co-ordination, and public support for lynx conservation; more research, monitoring and innovation; stricter legislation; more common strategic planning; land-use and infrastructure polices that are compatible with lynx conservation, and; more financial and other incentives for nature conservation on private land. Some of these changes would assist each other, and greater political support will be important for most of the other changes. They are quite ambitious and challenging. However, without these changes the lynx is likely to go extinct. Moreover, many of these changes would bring wider benefits to other species, the environment and Iberian society in general. The EU has a particularly important role in undertaking, mandating and maintaining these changes, as discussed in the next chapter.

6. Role of the European Union

The EU has been involved in many aspects of the decline and conservation of the Iberian Lynx to date, and EU involvement will be crucial to the successful conservation of the lynx in the future. This will require that the EU increases its current support of lynx conservation, decreases its support for policies and projects that threaten lynx, and accepts its responsibility for conserving the Iberian Lynx, as described below.

6.1 Responsibility of the European Union

The EU has a strong responsibility to ensure the survival of the Iberian Lynx. Firstly, the Iberian Lynx is endemic to two member states, and thus its conservation is a European-level problem requiring European-level solutions. Secondly, the EU is a signatory to the Bern Convention, legally requiring the EU to safeguard "strictly protected fauna" and their habitat, including the Iberian Lynx[122]. Thirdly, the Iberian Lynx and its habitat is protected by EU legislation (i.e. 1992 Habitats Directive). Whilst it is the responsibility of national and regional governments to carry out conservation work, it is the responsibility of the EU to ensure that they fulfil the requirements of the Habitats Directive and other EU legislation. Fourthly, the EU has a current commitment to "halt all biodiversity loss in the Union by 2010"[123] and there would seem to be no greater demonstration of failure to meet that commitment than if the Iberian Lynx were to become extinct on or soon after that date. Fifthly, the EU Commission has been made aware of the Iberian Lynx emergency for some time, through official briefings and publications, and has been lobbied to do more to save the lynx by conservation groups, concerned citizens and its own MEPs. Sixthly, the EU has often tried to positively influence nature conservation in other parts of the world, and future such efforts may be under threat if it comes to be seen that the EU cannot even look after its own endemic species. Seventhly, the EU has demonstrated an ability to positively influence the conservation of the Iberian Lynx – mainly via the LIFE programme – and has the resources, expertise and political power to do more to improve lynx conservation in the future. Finally, and most importantly, the EU is implicated in the recent decline of, and current threats to, the lynx and thus has the moral duty to ensure its future survival.

6.2 Support for lynx conservation

The EU has provided the legal framework for additional habitat protection for the Iberian Lynx via the 1992 Habitats Directive, and particularly the Natura 2000 system it created. Many of the areas proposed by Spain and Portugal for the Natura 2000 network have been selected due to their importance for the current survival and future recovery of the Iberian Lynx. Similarly, the EU has provided significant funds for lynx conservation projects via the LIFE programme and increased scrutiny and control of development via the Habitats Directive and an 1985 Directive (85/337/EEC) – amended in 1997 – requiring specific assessments of the effects of certain public and private projects on the environment. To date there have been 18 LIFE projects funded that are directed specifically at the Iberian Lynx, totalling over 8 million euros – representing 0.5% of the total EU LIFE-Nature budget of 1.5 billion euros for this period – and the process of certain development projects has been more strictly controlled than it would have been if Spain and Portugal had not joined the EU. In addition, the EU has provided political support, but not funding, to the captive breeding programme, and has influenced Spain and Portugal to reduce hunting pressures.

The positive impact of the EU, however, has not been as good as it could have been, and its overall impact has been negative. The recently concluded LIFE project in Extremadura failed in its aim to "boost lynx populations so as to guarantee its conservation in this region", and there is now very little evidence of any lynx surviving there. Similarly, LIFE projects funded in Portugal and Spain in the 1990s failed to make a significant impact and most areas targeted by these projects have now lost their lynx. These projects did progress lynx monitoring and start work on rabbit recovery and habitat conservation, but the overall impact on rabbit recovery was hampered by poor co-ordination between the various regions involved in the LIFE projects, and more significant measures to benefit lynx were not undertaken. The two current LIFE projects are now well technically co-ordinated via two committees and the Lynx Working Group, and do include projects that could benefit the lynx, such as supplementary feeding, rabbit recovery, habitat improvement, outreach and education. However, even these programmes have yet to demonstrate a significant impact on the lynx. Moreover, there is no guarantee, and some doubt, that current levels of EU funding for lynx conservation will be sustained, particularly given the imminent extension of the EU to cover ten new countries, many of which may make significant demands upon EU nature conservation budgets.

The positive impact of the EU on hunting controls has been minimal. Spain and Portugal have exempted themselves from some EU legislation (3253/91/CEE) on traps and predator control, and hunting controls remain inadequate, despite some EU assertions to the contrary[124]. New development controls introduced by the Habitats Directive, the Natura 2000 system and 1985 EIA Directive have had some impact on reducing the impact of some projects. However, these controls are not sufficient given that some projects that obviously have an environmental impact have not required an EIA (e.g. Villamanrique-El Rocio road), and some EIAs that are carried out do not adequately consider the needs of lynx conservation (e.g. EIA for Alqueva dam). Similarly, the Natura 2000 system has already been shown to be weak in preventing projects that destroy large areas of habitat (e.g. Breña II dam). Moreover, many Natura 2000 proposals have not yet been officially approved, and proposals to date are not considered extensive enough for the conservation of lynx and other species, by either the EU or NGOs[125]. In addition, government officials have claimed that there is insufficient funding and legislation available to adequately manage proposed Natura 2000 areas. Finally, whilst the EU has introduced tighter controls on some development projects, it has simultaneously increased the pressure and funding for development in general, with the net effect, from the lynx's point of view, being an increase rather than a decrease in problematic development.

Many lynx experts and conservation professionals would welcome more EU support and pressure for lynx conservation. In particular the EU could and should provide:

- Increased funding and co-ordination of lynx conservation projects into the long term
- More funds for rabbit recovery and habitat conservation in general
- Support to a new conference on the long term strategy for lynx conservation
- More pressure on Spain and Portugal to ensure that they fulfil existing requirements to reduce hunting and development pressures, and implement lynx recovery plans.
- More legislation and funding for nature conservation on private land
- Stricter controls on Environmental Impact Assessments and development projects, requiring stricter legislation and stricter, proactive enforcement of existing legislation
- More prescriptive legislation as to the management of Natura 2000 areas
- More pressure on Spain and Portugal to approve sufficient Natura 2000 areas

The biggest demand from lynx experts, however, is that the EU stops supporting land-use changes and infrastructures that destroy habitat and kill lynx, as described below.

6.3 Support for damaging infrastructure and land-use policies

The level of financial and political support given by the EU to infrastructure and land-use policies is higher than that given to nature conservation, including lynx conservation. This is not surprising, given that nature protection was not an original primary aim of the EU[126], and would not be problematic if the EU had not chosen to support infrastructure and land-use policies that fundamentally contradict lynx conservation, and its own conservation and environment policies.

The EU, however, has subsidised intensive forestry and agriculture, particularly via the Common Agriculture Policy (CAP), and new dams and roads, particularly via Structural Funds such as the European Region Development Fund (ERDF; FEDER in Spanish), which have destroyed habitat and threatened or killed lynx. If the EU had not provided these subsidies, many of these projects could not have been implemented.

The value of these subsidies runs into billions of euros, dwarfing any subsidies for conservation, and their negative impact is much greater than any positive impact from conservation. For example, EU funded roads have resulted in many lynx deaths, where as the captive breeding programme has yet to breed a single lynx. Similarly, EU funded dams and agriculture have destroyed vast areas of habitat, where as very few habitat areas have been successfully restored by conservation initiatives.

EU policies have also restricted traditional farming and land-use practices, that supported lynx and people for centuries, making them less profitable and thus encouraging them to be abandoned in favour of more intensive and environmentally damaging practices[127]. Recent reforms to the CAP have not yet redressed this balance as the CAP agro-environmental measures only subsidise traditional products and not methods, and have led to perverse and negative impacts, such as farmers clearing valuable scrub to plant intensively with trees[128].

Particular recent infrastructure projects that have destroyed lynx habitat and threatened or killed lynx, and which have been part-funded by the EU, include:

- Alqueva Dam, Portugal
- Villamanrique – El Rocio Road, Andalucia
- Almonte – Mazagon Road, Andalucia
- A2 Motorway, Portugal

Current projects under construction or proposals for new projects to be part-funded by the EU, that will threaten lynx and lynx habitat, include:

- Breña II dam, Andalucia
- Albacete-Linares Motorway, Castilla - La Mancha
- Odelouca dam, Portugal
- Silver Motorway, Extremadura

There is no fundamental reason why EU subsidies could not be fundamentally re-directed towards sustainable water, transport, agriculture and forestry projects that compliment or benefit lynx conservation, and away from projects that threaten lynx and lynx habitat. Moreover, if subsidies are not fundamentally changed, the EU's own conservation programmes will continue to be undermined and will not be able to be successful in conserving species such as the lynx. One particular suggestion has been for a new expert committee at the EU level to scrutinise all applications for EU funds for projects to determine whether or not they are acceptable on environmental grounds[129]. However, the EU is under a lot of different pressures, many of which are more powerful than, and contradict, nature conservation interests, and nature conservation has long been a relatively isolated and weak sector within the EU[130]. It might thus be expected that the EU will not fundamentally change its subsidy programme, at least not fast enough to save the lynx from extinction, without increased levels of pressure from the media, politicians, the public and NGOs.

6.4 Conclusion

The EU has the responsibility, the duty and the potential to save the Iberian Lynx from extinction, but is not currently doing so due to inadequate support for lynx conservation, inadequate controls on development and inappropriate support for projects and policies that threaten lynx and lynx habitat. In order to save the lynx, and its own reputation, the EU needs to urgently increase its financial, political and legal support to lynx and wider nature conservation, and, crucially, alter the way in which it subsidises water, transport, agriculture and forestry projects. Thus a lot needs to be changed in a short time, but a lot is at stake. These changes will help many species other than just the lynx and would help set a trajectory within and outside the EU towards greater nature conservation. Conversely, if the EU does not act now, and the lynx should become extinct, a watershed would have been reached, with wide implications for nature conservation across the world, given that the EU – with its wealth and scientific tradition – rather than supposedly less developed or "green" areas of the world, will have presided over the first extinction of a big cat species in modern times.

7. Conclusions

This report has sought to provide a general and up to date overview of the Iberian Lynx Emergency, including the decline and current status of the species, and the progress of, obstacles to, and future requirements of, successful lynx conservation. In particular this report has addressed four key questions, each of which is answered below.

How has the Iberian Lynx come to be critically endangered?
The Iberian Lynx has come to be critically endangered due to a combination of diverse factors. Firstly, it has long been subjected to hunting pressures and this non-natural mortality was added to in recent decades by increased road-kill pressures. Secondly, the Iberian Lynx has lost a lot of its habitat to fire, urbanisation, intensive agriculture and forestry, and new dams and roads, and what habitat remains has been fragmented. Thirdly, populations of its staple food, the wild rabbit, crashed in the late 20th Century – due to disease, hunting and habitat loss – and have not yet recovered. Finally, the conservation response to the decline in the lynx developed late and slowly due to a number of political, social and scientific factors.

Why has more not been done to conserve the Iberian Lynx to date?
Not enough has been done to conserve the Iberian Lynx and reverse its decline, for a number of reasons. Firstly, international isolation, poor scientific knowledge about the lynx, and little domestic pressure for nature conservation, until the 1980s, meant that Spain and Portugal did not even start to try to conserve the lynx until 30 years ago. Secondly, a combination of inadequate funding and co-ordination of lynx conservation, and little public and political support, meant that lynx conservation subsequently developed slowly, at least until the last few years, with little or no progress in key areas. Thirdly, rapid and unsustainable development continues to undermine and conflict with lynx conservation efforts.

What needs to change in order to conserve the Iberian Lynx now?
Successful lynx conservation will require several changes in the conservation effort and society at large. Most importantly, political and public support for lynx conservation needs to be increased, particularly relative to that given to other policy areas, and these other policy areas – including transport, water, agriculture and forestry – need to be made compatible with lynx conservation. Secondly, the lynx conservation effort itself will need better funding and political co-ordination, backed up with common strategic planning amongst stakeholders, stricter legislation, and more research, innovation and monitoring.

What is the particular role of the European Union in lynx conservation?
The EU has been partly responsible for the recent decline in the Iberian Lynx, has contributed to the developing conservation effort, and is partly responsible for some of the current obstacles to lynx conservation – particularly rapid and unsustainable economic development. The EU could play an important role in saving the lynx in the future, though at present, along with Iberian Governments, it continues to have a net negative impact and as a result neither the lynx, nor the reputation of the EU as "environmentally-friendly", seem likely to survive.

The most striking thing about the Iberian Lynx Emergency is that it is very complicated to address. There is no single over-riding problem or one potential solution. Similarly, there is no one organisation uniquely responsible for the situation, or likely to offer all or most of the solutions in the future. Rather, there is a combination of diverse problems, requiring a diversity of solutions, and a diverse mix of organisations with relevant expertise and responsibility, which will need to work more closely together, and harder, to avoid the collective embarrassment that the extinction of the Iberian Lynx would bring.

Appendix: Lynx Conservation Effort

Partly in response to the decline of and threats to the lynx, a "conservation effort" has developed, including a number of organisations, laws, plans and strategies, committees, conferences and co-ordinators, as described below.

Organisations

A number of governmental, non-governmental and scientific organisations have come to be involved in lynx conservation, at the regional, national and international level. They have influenced each other and the development of laws, strategies, conferences, committees, co-ordinators and, ultimately, conservation projects, as detailed below.

International Organisations

International organisations that have become involved in lynx conservation include:

- **The Council of Europe;** is comprised of 45 member states including the EU as a whole, and Spain and Portugal. Its main impact upon Iberian Lynx conservation has been via its Wildlife Convention (the **Bern Convention**), which has a "standing committee" based in Strasbourg that has annual meetings with representatives of member states and a permanent staff of ecologists, including a Spanish ecologist who has been able and willing to pay particular attention to the Iberian Lynx issue, using both formal and informal contacts to pressure action from individuals and organisations in Spain and Portugal. To date the Bern Convention has published an action plan, with the support of WWF international, was involved with the Andujar Conference and follow up visit, and has made several recommendations concerning the Iberian Lynx. However, states rather than regions are signatories of the Bern Convention, and this has limited its power to influence the action of Spanish Autonomous Regions in lynx conservation. In addition the Bern Convention has few actual sanctions or resources with which to alter conservation policies.
  Contact: Eladio Fernandez-Galiano

- **World Wide Fund for Nature (WWF) International;** has contributed to Iberian Lynx conservation mainly through its creation in 1995, and subsequent sponsorship of, the **Large Carnivore Initiative for Europe (LCIE)**, which has to date created action plans for the Iberian Lynx, Eurasian Lynx, Wolf, Bear and Wolverine, each of which was endorsed and published by the Council of Europe in 1999. The LCIE also participated in the Andujar Lynx Conference and subsequent follow up visit. WWF International has also funded research and publications on the Iberian Lynx in collaboration with WWF Spain, WWF UK and WWF Holland, and used its Panda Passport campaign to pressure for progress in lynx captive breeding. However, WWF International has not placed the Iberian Lynx alongside the Tiger as a priority campaign species, despite it being the most endangered feline in the world. WWF may make the lynx a "regional flagship species", though this has yet to be decided. Similarly, the LCIE is mostly aimed at the long term recovery of carnivores, and not emergency campaigns, given that only the Iberian Lynx is critically endangered.
  Contact: Sue Lierberman (WWF), Agnieszka Olszanska (LCIE)

- **World Conservation Union (IUCN);** has contributed to Iberian Lynx conservation through its regular updates as to the status of the species, and particularly via its **Cat Specialist Group**, which is well respected and has a lot of expertise, especially given its previous successful involvement with the recovery of the Eurasian Lynx in central Europe. This group has advised on current conservation projects, helped to instigate an international conference on the lynx in 2002, and a subsequent fact finding visit to Spain, and is currently planning to visit Portugal in the near future and hopes to facilitate further workshops on the development of lynx conservation and lynx monitoring. However, the work of the Cat Specialist Group is limited by language barriers, a desire and need to keep involvement technical rather than political and a general philosophy that nature conservation needs to be locally, rather than internationally, led. Members of the IUCN include governments, and the IUCN has influence as a technical adviser, and thus has to avoid becoming too political.
  Contact: Urs Breitenmoser (Cat Specialist Group)

- **European Union (EU) Commission;** has been involved in lynx conservation through the funding of conservation projects via the **LIFE programme** since 1992, and through the control and support of infrastructure projects and land-use policies that have had a more detrimental impact. Currently two Lynx LIFE projects exist, one in Andalucia and one in Castilla - La Mancha, and there are several relevant dam, road, agriculture and forestry proposals being scrutinised and supported by the EU. The particular role of the EU in lynx conservation is considered in detail in Chapter 6.
  Contact: Margot Wallström (EU Environment Commissioner)

International involvement in Iberian Lynx conservation has had some impact to date upon conservation "on the ground" in Spain and Portugal, and there is quite good co-ordination between the IUCN, LCIE and Bern Convention, including via a recently created Iberian Lynx "International Committee"[131]. Achievements to date have included technical advise and co-ordination, financial contributions and some political persuasion. A particular barrier to increased international involvement is the possible imminent extinction of the lynx in Portugal, in which case it would no longer be an "international" species, with a possible subsequent decline in pressure and ability for international action.

Spanish Organisations

Spanish Organisations that have become involved in lynx conservation include:

- **Adena/WWF Spain**; has had quite a long and diverse involvement with Iberian Lynx conservation including purchasing an area of land in Doñana important for lynx in 1961, conducting the "unique in the world" campaign against new roads, dams, the fur trade, non-selective predator control and poor hunting management in the 1990s, pressuring the EU to reject Spanish Natura 2000 proposal, writing a number of reports and a book on the lynx, and conducting rabbit repopulation and habitat improvement work on private estates in Castilla - La Mancha and Andalucia. WWF Spain has worked with and been funded by other WWF offices including WWF International, and is also funded by Fundacion Biodiversidad and CajaSur. WWF Spain is not involved in current LIFE projects, but is included in co-ordination meetings.
  Contact: Luis Suarez

- **Ecologistas en Accion**; an umbrella organisation (previously called CODA) formed of over 300 previously independent local conservation organisations. Ecologistas en

Accion created the "Project Lynx" from 1994, which involved publicity campaigns against non-selective hunting, teams of ecologists following lynxes, public meetings and direct contact with gamekeepers. Other work includes lobbying and protesting against government, for example concerning current motorway and dam proposals, and teaching children in schools about the lynx, as part of the LIFE programme.
Contacts: Javier Moreno (Jaen) and Joaquin Reina (Cordoba)

- **La Raya;** a non-governmental organisation that has campaigned for lynx and general nature conservation, and has conducted some habitat improvement and rabbit recovery work, particularly in Extremadura and Castilla y Leon.
Contact: Jesus Garzon

- **Fundacion CBD Habitat**; was set up in 1999, aims to "conserve and research biodiversity and its natural, cultural and human environment" and has to date been involved with projects and land owner agreements aimed at conserving the lynx, monk seal, imperial eagle and other species. Funding is received from several sources, including the Spanish Government, Euronatura and Fundacion de Caza, and the Foundation is the beneficiary of the Castilla - La Mancha LIFE project, and a partner in the Andalucian LIFE project. Fundacion CBD Habitat is independent from government and is not to be confused with Fundacion Biodiversidad, which funds and co-ordinates conservation projects on behalf of the Ministry of Environment.
Contacs: Javier Oria

- **Ministry of Environment**; manages the Doñana National Park, El Acebuche breeding centre, and the estate of Lugar Nuevo in Andujar, and – via DGCONA – has created and co-ordinates the Spanish National Lynx Strategy and Lynx Working Group, and is a partner in the Andalucian LIFE project. The Ministry currently undertakes rabbit recovery and habitat improvement work. In recent years, working relations with the Junta de Andalucia regarding lynx breeding have been poor – exacerbated by the fact that each government was controlled by a different political party – but relations have recently improved, as regards lynx conservation and captive breeding, following the creation of a Bilateral Commission and Bilateral Agreement in 2003.
Contact: Nicolas Guzman Lopez

- **Junta de Andalucia**; the regional government of Andalucia – currently governed by the socialist PSOE party – is involved in rabbit recovery, habitat improvement, and agreements with private estates, as well as developments that threaten lynx, such as intensive agriculture and road improvements. The Junta is the main beneficiary of the current Andalucian LIFE Lynx project, and has created the Andalucian Lynx Pact, signed by politicians and thousands of citizens agreeing to act to avoid the "disappearance of the lynx and the pride and satisfaction in having it conserved in our territory". It also manages a lynx rehabilitation centre, Jerez Zoo and the Natural Parks of Doñana and Andujar. However, the Junta has not officially approved a lynx recovery plan, despite having a draft prepared for the last four years.
Contact: Miguel Angel Simon

- **Junta de Castilla - La Mancha**; was involved in lynx LIFE projects in the 1990s, but is no longer, and is currently conducting rabbit recovery and lynx monitoring work in Montes de Toledo, in consultation and collaboration with Fundacion CBD Habitat. The Junta de Castilla - La Mancha is the only regional government with an officially approved lynx recovery plan and was described by WWF Spain in the 1990s as the

"regional government doing the most for lynx conservation". However, today very few lynx survive in Castilla - La Mancha, and those populations that were monitored and supposedly protected by projects in the 1990s have subsequently gone extinct.
Contact: Ramon Pintado

- **Junta de Extremadura;** was involved with lynx LIFE projects until 2003, but is no longer, and currently conducting rabbit recovery and hunting control work, funded in part by two INTEREG programmes, one of which is with neighbouring Portugal. The Junta manages the Los Hornos animal recovery centre, which is proposed to be part of the lynx breeding programme, and has representatives on the Lynx Working Group and breeding committee. However, the Junta has not yet approved a significant lynx recovery plan and today few lynx survive in Extremadura.
Contact: Javier Caldera

- **Centro Superior de Investigaciones Cientificas (CSIC)**; is involved in lynx conservation via its "**Biological Station of Doñana" (BSD),** which has researched and published extensively about the lynx, manages and studies the "biological reserve" within the larger Doñana National Park, and whose representatives have advised on many aspects of lynx conservation management and are members of the Lynx Working Group. CSIC is funded by the Ministry of Culture and thus the BSD is somewhat independent of the Doñana National Park, funded and managed by the Ministry of Environment. This has to date led to some problems and need for political co-ordination between the institutions.
Contacts: Miguel Delibes, Francisco Palomares

Portuguese Organisations

Portuguese Organisations involved in lynx conservation include the following:

- **Portuguese Environment Ministry (through its wildlife arm: ICN);** has conducted lynx monitoring, habitat improvement and rabbit recovery work, and was the beneficiary of several LIFE projects in the 1990s. However, conservation has so far been unsuccessful and the lynx is nearing extinction in Portugal. Moreover, poor administration of LIFE funds in the 1990s has meant that subsequent requests for EU funding have been unsuccessful, and there is now a general budget crisis in Portugal, which has seen the budget for managing national parks cut by 50% last year and a further 80% this year. The ICN manages, in particular, the Malcata Reserve, where lynx were present until recently, and where there are plans to build a breeding centre as part of the breeding programme, and the ICN also has a draft, but not an approved, lynx action plan. The ICN is negotiating with Spanish authorities about possible release of Spanish lynx in Portugal, but a political agreement has yet to be made.
Contact: Rodrigo Serra

- **League for the Protection of Nature (LPN);** was instrumental in the campaigning that set up the Malcata Nature Reserve in mountains near the Spanish border and halting habitat clearance, specifically to save the approximately 25 lynx that still lived there. Subsequently the LPN has lobbied the Portuguese Government and the EU to reduce and avoid damaging sensitive lynx areas with infrastructure and other developments, with some success, including the halting of EU funds for the Odelouca Dam which threatens to flood a valley that may still contain lynx.
Contact: Jorge Palmeirim

- **SOS Lynx**; is a campaign organisation set up in Portugal in 2000, specifically to help save the Iberian Lynx, and works especially at an international level. It remains the only organisation dedicated to lynx conservation. SOS Lynx has lobbied governments, written the first English and Portuguese language book on the lynx, maintains a lynx website and helped raise the profile of the lynx, particularly in Portuguese, English and international media. SOS Lynx conducts environmental education with children, and works with hunters and farmers to raise awareness of and regard for the lynx. SOS Lynx is also currently developing innovative new ways of monitoring lynx at low density and has conducted several campaigns, including to protect cork oak forests, and against the Odelouca and Alqueva dams.
  Contact: Eduardo Gonçalves

Laws and legislation

Laws and legislation that are particularly relevant to lynx conservation include the following:

- **EU Habitat Directive**; (1992) designating the lynx as a priority species, the habitat of which needs to be given special protection and can only be developed in cases of over-riding public need or safety. The habitat directive also set up the Natura 2000 network, which seeks to create an inter-connected network of protected areas, each of which needs to have a management plan and be given greater protection from development.

- **Spanish Royal Degree 439/90**; (1990) declaring the lynx in danger of extinction.

- **Spanish conservation law 4/89;** (1989) requiring regional governments to develop recovery plans for, and protect, listed priority species such as the lynx.

- **Bern Convention;** (1982) was signed in 1979 and entered into force in 1982, and aims to "conserve wild flora and fauna and their natural habitats, especially those species and habitats whose conservation requires the co-operation of several States .....giving particular emphasis to endangered or vulnerable species": such as the Iberian Lynx. 45 states and the EU as a whole are signatories of the convention.

- **Washington Convention/CITES;** was signed in 1973, and entered into force in 1975, and 164 states are signatories. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. This is now particularly relevant to the lynx, as its scarcity makes it vulnerable and attractive to illegal trade.

- **Lynx legally protected in Portugal: 1974**

- **Lynx legally protected in Spain: 1973**

- **Lynx hunting banned in Spain: 1966**

The creation of these laws and agreements is important and has assisted lynx conservation, by altering the actions of individuals, encouraging the creation of new plans and strategies, and setting up new conservation initiatives such as the Natura 2000 network. However, the creation of a law is not enough to ensure its adequate enforcement. Lynx have continued to be deliberately killed despite legal protection in Spain and Portugal, most regional governments

have not approved official lynx recovery plans despite law 4/89 and Spain and Portugal have still not created a sufficient network of Natura 2000 areas.

Committees, commissions and co-ordinators

Co-ordinators, committees and commissions with relevance to the lynx include the following:

- **Iberian Lynx Working Group;** a technical committee formed of lynx experts and representatives from government agencies, NGOs and scientific institutions, including both Spain and Portugal, all the relevant Spanish regions and CSIC. It was created in 1996 by the Spanish Environment Ministry, meets 2 to 4 times a year, and has been instrumental in creating the Spanish National Lynx Strategy, the original proposals for the two current LIFE projects, and various protocols on lynx supplementary feeding and rabbit repopulations. In addition, the group facilitates the sharing of information between its various members and advises other bodies on lynx related issues. However, the group has no political power and has limited ability to co-ordinate projects across regions. For example, the group recommended against, but has no power to stop, the Toledo-Cordoba motorway proposal, and helped plan, but was unable to set in motion the Captive Breeding Programme, due to conflicting political pressures and interests, outside the control of the group.

- **Co-ordinator of the Spanish National Lynx Strategy;** employed by the Spanish Ministry of Environment, tasked with co-ordinating the various aspects of the Spanish National Lynx Strategy, approved in 1999. The individual concerned has a lot of experience and contacts in lynx conservation. However, his actual ability to implement the recovery strategy has been hindered by a lack of political power.

- **Lynx breeding commission;** has 15 members, including representatives from Spain and Portugal, and all the institutions that might be involved in captive breeding, including El Acebuche (Doñana), Barcelona Zoo, Jerez Zoo and "los Hornos" animal recovery centre in Extremadura. This group acts as technical co-ordination for the breeding programme, in close co-operation with the Lynx Working Group, meets 2 to 5 times a year, and has direct support from international specialists, including IUCN.

- **Lynx breeding co-ordinator;** this individual is an experienced expert based at Jerez Zoo, tasked with implementing the various aspects of the Spanish Breeding Action Plan, approved in 2001. However, the co-ordinator has not at times had the political power required to fulfil his role, and to act in the best interests of the lynx.

- **Andalucia-Spain Lynx Breeding Bi-lateral Commission;** this committee was created in June 2003 as a result of a Bilateral Agreement between the Andalucian and Spanish governments, so as to overcome the political disagreements between the two administrations, which have to date prevented any progress with the Captive Breeding Programme, and is formed of four members, two from each administration. Subsequently some progress has been made with the programme, including the capture of a new male lynx, and there is general optimism that the political climate is now more conducive to significant progress. However, there is also concern that the commission is rather a "black box" that does not consult or involve other regions or non-governmental organisations, which will need to be included if the breeding programme if it is to be effective, leading to the possibility that future lynx breeding and reintroductions may be inappropriately focused on Andalucia.

- **Andalucia-Spain National Parks Bi-lateral Commission;** this committee was created in 1995 to oversee the management of the two National Parks in Andalucia (Doñana and Sierra Nevada), which are managed by the national government, but all flora and fauna within them –including any lynx - is "owned" by the Junta de Andalucia regional government. This division of responsibilities and political differences between the two administrations had caused management problems, which seemed to have been addressed by this commission.

- **Andalucia Lynx Conservation Advisory Commission;** this committee provides technical advise and backup to the conservation projects and programme conducted by the Junta de Andalucia, and includes NGOs, experts and hunting associations.

- **Andalucian LIFE co-ordination Committee;** this committee co-ordinates between the various partners in the Andalucian LIFE project, which includes hunting associations, Fundacion CBD Habitat, DGCONA and Ecologistas en Accion.

- **Andalucia-Castilla - La Mancha LIFE co-ordination committee;** this committee helps to co-ordinate between the two current LIFE projects in Andalucia and Castilla - La Mancha, making them more compatible and efficient. For example, as a result of this committee the same format has been used by both projects for outreach leaflets.

- **International Committee;** this was set up in 2003 following on from the Andujar Conference and recommendations of the Bern Convention. It has to date involved personnel from IUCN, the Bern Convention and LCIE, and aims particularly to increase co-operation between Spanish and Portuguese national and regional institutions with the relevant international organisations. The committee organised a visit to Spain in March 2003 as a follow-up to the Andujar Conference[132].

These committees, co-ordinators and commissions have helped to increase both political and technical co-ordination of lynx conservation. However, actual and potential problems remain, and extra committees and commissions will probably need to be created in the future.

Conferences and workshops

- **Andujar Conference (2002);** was stimulated by a suggestion for a more modest conference by IUCN, which was then increased in scope and organised by Spanish officials. Experts and policymakers from regional, national and international governments and non-governmental organisations attended. The conference was particularly important in reporting and emphasising the stark decline in the lynx, given that the first extensive camera trap surveys had recently been completed and the IUCN had subsequently declared the lynx as "critically endangered". The conference also helped to break down institutional barriers and provided a forum for the Junta de Andalucia to air their desire for a formal agreement with the Spanish Government. However, the conference did not address, and never intended to address, the longer term strategy for lynx conservation, did not include important stakeholders such as the EU and was not directly instrumental in instigating actual conservation projects.

- **Spanish Conference on Lynx Breeding (1999);** was organised by the Spanish Ministry of Environment to help create the subsequent "Action Plan" for lynx

breeding. 28 experts, with experience relating to lynx breeding, attended, including researchers, and representatives from Spain, Spanish Regions, Portugal and zoos.

- **Conference on the Viability of Iberian Lynx Populations (1998);** was organised by the Spanish Government and the Conservation Breeding Specialist Group of IUCN and attended by representatives from the Spanish regional and national, and the Portuguese, Governments, NGOs, scientific experts and others. An unpublished document was produced, which led in part to the subsequent Spanish National Lynx Strategy, and called for – in particular – a captive breeding programme.

These conferences have helped to focus attention on particular issues in lynx conservation, overcome differences between key stakeholders, and develop some particular initiatives. However, common long term strategic planning is still lacking between organisations.

Plans and strategies

Plans and strategies relating to the Iberian Lynx include the following:

- **Castilla - La Mancha Lynx Recovery Plan, 2003** : as yet the only lynx recovery plan in a Spanish Region. It covers many aspects, including the need to conduct and co-operate with captive breeding, hunting controls and habitat conservation.

- **Spanish National Lynx Breeding Plan, 2001** : coming from a draft created at the 1999 conference. Subsequently an agreement was reached between Spanish Ministry of Environment and Jerez Zoo in 2002, for the latter to co-ordinate the plan.

- **Council of Europe Iberian Lynx Action Plan, 2000** : mandates a lot of scientific, technical, planning and information and co-ordination actions, and that "land management for lynx conservation has to prevail over other land-uses". The plan has been influential on subsequent plans and projects. However, many of its recommendations have not yet been achieved due to a number of obstacles.

- **Spanish National Lynx Strategy, 1999 :** was created partly in response to pressure and advice from the Bern Convention, and law 4/89, and so as to help the Spanish Regions in creating there own recovery plans. The strategy created the role of a Spanish Lynx Conservation co-ordinator, and mandated specific actions from the already created Lynx Working Group. It also specifically recommended a captive breeding programme, better Environment Impact Assessments, rabbit recovery, hunting controls and outreach, but does not identify or address obstacles.

- **Bern Convention Recommendations**: no. 19 (1991), 74 (1999) , 82 (2000) and 94 (2002); some of which have subsequently been implemented, including a recovery centre for lynx. However, specific recommendations for captive breeding and recovery plans in Portugal and Spanish regions have still not been achieved.

- **Lynx Management Plan**, **Doñana 1988**: aims to recover density and distribution of lynx in Doñana by managing habitat and recovering rabbits. This has led to some local habitat and thus lynx recovery. However, rabbits have not been recovered in Doñana, and lynx have significantly declined since this plan was created.

These plans and strategies are important. They have helped to increase the political profile of the lynx, and the profile, co-ordination and, in some cases, implementation of certain conservation projects. However, many recommendations in these plans have not been implemented, and many important lynx areas – including Portugal and most Spanish regions, including Andalucia – do not yet have official lynx recovery plans.

Conclusion

Quite a lot of organisations, laws, committees and commissions, plans and strategies, and co-ordinators have been created and become involved in lynx conservation. Nevertheless the lynx has continued to decline and is now in danger of imminent extinction.

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