The feasibility of a population reinforcement of White-tailed Eagles *Haliaeetus albicilla* in Exmoor National Park



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1. Project goals and justification

1.1. Aims and objectives

The principal aim is to reinforce the establishing population of White-tailed Eagles in southern England, as part of ongoing efforts to restore the species to its former range, which began on the Isle of Wight in 2019. To date a total of 37 juvenile White-tailed Eagles have been released on the Isle of Wight, and this resulted in the first breeding pair in West Sussex in 2023. Two other territorial pairs are currently established in the expected natal dispersal zone of the translocated birds, which is 50-60km from the release site. Additional small-scale releases away from the Isle of Wight will increase the geographical distribution of the species and, in doing so, make it more resilient to stochastic events, and any future avian pandemics. The proposed project would involve the release of up to 20 White-tailed Eagles in Exmoor National Park over three years. This population reinforcement is the first of three proposed small-scale projects in South West England, as outlined by Dennis et al. (2025).

Breeding White-tailed Eagles are a missing part of England's native biodiversity and were lost entirely through human activities. As such we believe there is a moral duty to restore them. The Government's 25-year Environment Plan launched in 2018 identified the White-tailed Eagle as a species of interest for recovery. In addition, the England Species Reintroductions Taskforce, was set up by Defra as an independent group (with Natural England as secretariat) 'to realise the full benefits of species conservation translocations for nature recovery and society'.

The White-tailed Eagle is an important flagship species in wetland and coastal ecosystems and there is already evidence that the presence of the species in southern England is furthering discussions around wetland restoration. Furthermore, evidence from Scotland indicates that re-establishing White-tailed Eagles will benefit the local economy in areas they begin breeding, through increased tourism revenue.

All responsible reintroduction and reinforcement projects should meet the Guidelines for Reintroductions and other Conservation Translocations developed by the International Union for the Conservation of Nature (IUCN) (https://portals.iucn.org/library/efiles/documents/2013-009.pdf) and we believe that

this project meets all of the criteria required of a conservation translocation aiming to reintroduce a species within its indigenous range. This feasibility report has been compiled according to the criteria laid out in these guidelines. Likewise, the project adheres to the Defra Code for translocations.

1.2. The White-tailed Eagle

The White-tailed Eagle, often known as the Sea Eagle, is the fourth largest eagle in the world. It is usually associated with sea coasts, rivers and larger freshwater lakes. They are iconic birds with a rather vulturine appearance; the broad wings are up to 2.5 metres in span. The females are larger and can weigh up to 7 kg while the males range up 4.5 kg. The adult plumage is unmistakeable; the brown body contrasting with a pure white tail and a pale grey head with a bright yellow bill. The young are brown all over including the tail and by annual moults they slowly attain the adult plumage over four to five years (Forsman 1999).

The diet of white-tailed eagles has been studied extensively across its range. This research has shown that marine and freshwater fish are preferred when available (Ekblad et al. 2016, Nadjazafeh et al. 2016). Avian prey is also regularly taken, with species composition varying spatiotemporally. Common coot (*Fulica altra*) and greylag goose (*Anser anser*) are favoured in the Netherlands (van Rijn et al. 2010, van Rijn and Decker 2016), whilst seabirds, particularly the northern fulmar (*Fulmarus glacialis*) are key prey species in Scotland (Grant 2021, Reid et al. 2023). Some terrestrial species are also predated, including mesopredators such as Common Buzzard *Buteo buteo* nestlings and corvids (Kamarauskaite et al. 2020, Mirski and Komar 2023). Mammals typically form a smaller proportion of diet, and are usually small to medium sized species, such as rodents or lagomorphs. Several other taxa also occur in diet including amphibians such as common toad (*Bufo bufo*), molluscs including common squid *Loligo vulgaris* and curled octopus *Eledone cirrhosa* (Reid et al. 2023), and reptiles such as tortoises and snakes (Bounas et al. 2023). White-tailed Eagles released on the Isle of Wight regularly catch Common Cuttlefish *Sepia officinalis* during the spawning season when they are super abundant in seagrass beds along the South Coast.

White-tailed Eagles usually adopt the ‘sit and wait’ strategy, in which individuals observe the landscape from a perch for prolonged periods before making occasional short pursuits of potential prey (Nadjazefeh et al. 2016). They are also effective kleptoparasites, pirating fish from piscivores birds including Great Cormorants *Phalacrocorax carbo* (Källander 2018, Bregnballe et al. 2022) and also mammalian predators such as European Otter *Lutra lutra* (Love 2013). Carrion is also known to form an important component of White-tailed Eagle diet, particularly in winter when many birds may congregate around large carcasses (Halley and Gjershaug 2008, Nadjazafeh et al. 2016), and sometimes during the breeding season (Sulkava et al. 1997, Marquiss et al. 2004). This propensity to feed on carrion is exemplified by the fact that the most common anthropogenic cause of death in white-tailed eagles is lead poisoning, through ingestion of lead ammunition fragments found in large carcasses hunted as game (Nadjazafeh et al. 2013, Isomursu et al. 2018). Carrion is particularly important for immature birds during their first winter (Nadjafzadeh et al. 2015).



Figure 1. Adult White-tailed Eagle in flight on Isle of Wight (photo by Ainsley Bennett).

White-tailed Eagles build large stick nests, which can be constructed in trees, on rocky cliffs and even on the ground on small islands (Figure 2). The clutch is one to three pale eggs; both sexes incubate, but mostly the female. The incubation period is about 38 days and young fly for the first time at 10 to 11 weeks. The young stay with their parents for several months before becoming independent.

The White-tailed Eagle is distributed as a breeding bird over the northern Palearctic from Japan, Kamchatka and the Bering Strait in the east, to Germany, Scotland and Iceland in the west, extending to Greenland in the Nearctic zone. In the north, its range extends from the Barents Sea coasts roughly along 70° N through Siberia. In the south, it occurs from Croatia to the Caspian Sea and between 30° and 40° eastwards to the Pacific (Helander and Stjernberg 2002). Originally the European distribution extended south to the North African coast but was exterminated principally by human persecution, with the last individuals on the island of Corsica in the 1950s. Except for some northern populations, territorial pairs are mainly sedentary whereas juveniles may move south or wander extensively. Migration and wintering areas include all countries in Europe, but the most significant areas concur within the breeding range. In Asia, small numbers winter south to North Korea, Taiwan, Pakistan and India (Helander and Stjernberg 2002).



Figure 2. Adult White-tailed Eagle feeding two small chicks in an oak tree nest in West Sussex (photo by Steve Egerton-Read).

1.3. History of the White-tailed Eagle in the UK

It is clear that the White-tailed Eagle was formerly widespread across all parts of southern England before suffering intense persecution during the Middle Ages, which led to its eventual extinction as a breeding species by the early nineteenth century (Love 2006).

The population in the United Kingdom was estimated to be as high as 1000-1400 pairs in 500 CE, with breeding pairs located throughout southern England (Evans et al. 2012). Archaeological evidence indicates they were widely distributed across southern England. The earliest records date back to the Pleistocene but most come from Roman sites, indicating that they were widespread during this period (Yalden 2007) (Figure 3B). Similarly, an analysis of place names interpreted as indicating the presence of White-tailed Eagles, also indicates that the species occurred throughout the region (Evans et al. 2012) (Figure 3A). [redacted]

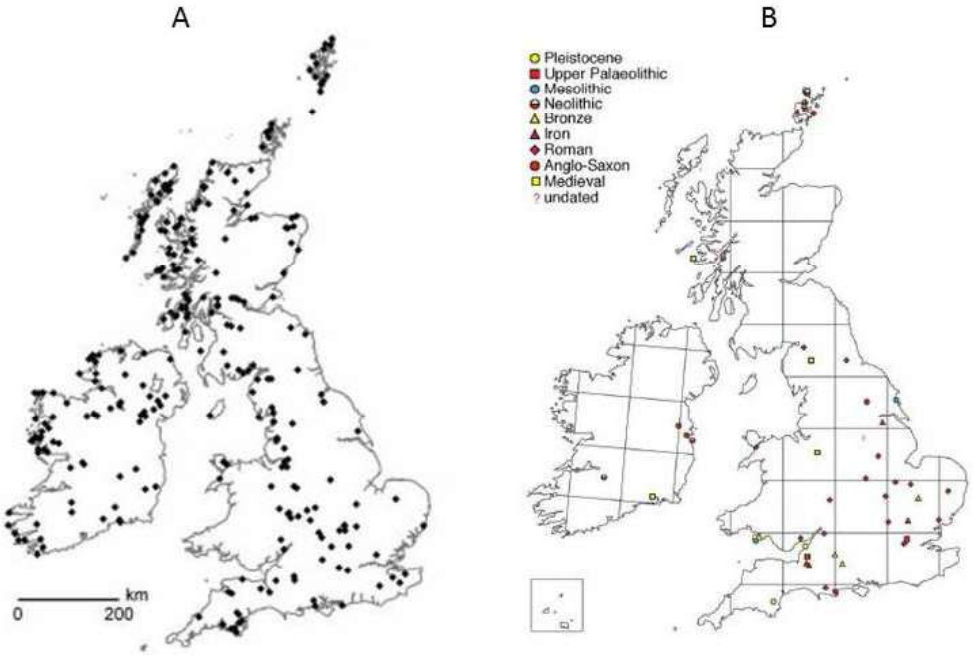


Figure 3. A) Geographical location of place names interpreted as indicating the presence of White-tailed Eagles (Evans et al. 2012); B) Map showing the archaeological records of White-tailed Eagles in the UK (Yalden 2007).

White-tailed Eagles, like many birds of prey, were relentlessly persecuted, particularly during the latter part of the Middle Ages and the population declined sharply as a result. By the late eighteenth century only a few isolated breeding pairs persisted in England, with the last known pair in southern England breeding on Culver Cliff on the Isle of Wight in 1780 (Love 2006). By the beginning of the eighteenth century the species was extinct in England, although a pair bred on the Isle of Man in 1815 (Love 2006).

1.4. Why should White-tailed Eagles be re-introduced to South West England?

This project provides an opportunity to restore a population of White-tailed Eagles to parts of its former range in South West England from which it was eradicated entirely due to the influence of man (Yalden 2007, Evans et al. 2012). In a comprehensive review of the past status of the White-tailed Eagle in Britain, Yalden (2007) concludes, "…there is no doubt that White-tailed Eagles frequented lowland, southern Britain through Roman and Anglo-Saxon times. Historically, there is no reason to question the propriety of attempting to reintroduce the species to southern England."

The methods for the collection, care, translocation and release of juvenile White-tailed Eagles are thoroughly understood following the successful reintroduction projects that have been undertaken in Scotland and Ireland and the ongoing project on the Isle of Wight.

The project would also complement wider European efforts to restore the White-tailed Eagle to its former range. Reintroduction projects are underway in France and northern Spain, and the project team are in regular contact with the organisations running these projects.

Although the general trend for White-tailed Eagle in Europe is for populations to be increasing, the current European range remains extremely restricted compared to historical times. Range recovery is very slow because dispersal is limited by low natal dispersal distances of males in particular. Like many long-lived monogamous birds

with delayed sexual maturity, White-tailed Eagles have a breeding system where males compete for resources in order to attract females, and hence there is a greater selective advantage for males to stay closer to their natal sites, whereas without the constraint of establishing a territory, females choose between the available resources of different males and consequently often disperse further (Whitfield et al. 2009). In an extensive study of the natal dispersal of the reintroduced population of White-tailed Eagles in Scotland, Whitfield et al. (2009) found that the mean dispersal distance for males was less than the females. Median age of recruitment to the breeding population was 4 years for males and 5 years for females, and median values for natal dispersal were 21–45 km in males and 47–58 km in females. This, however, varied according to the stage of the reintroduction project. Natal dispersal distances were identical among the males and females that bred following the first phase of releases; but as the population expanded, sex differences became more apparent with females dispersing further than males. This was exemplified by the fact that the mean terrestrial natal dispersal (i.e. straight-line distance between the release site and first breeding location minus any distance over sea) of breeding birds from the first Scottish release was 11 km for males and 11 km for females (full direct line distances (i.e. including areas of sea) 45 km / 47 km). The corresponding figures for wild-bred birds remained 11 km for males but rose to 26 km for females (full direct line distances 21km / 58 km).

The satellite tracking of White-tailed Eagles released on the Isle of Wight, as well as elsewhere in the species range, shows immature birds wander extensively during their first two-three years in particular. However, the constraining nature of natal philopatry, coupled with strong conspecific attraction in the species (Whitfield et al. 2009), means that most young birds return to breed close to their natal site. Thus, although multiple immature birds have visited Exmoor and the wider South West region since the Isle of Wight project began, it is unlikely that these individuals will settle to breed in the short-medium term. The proposed release site on the Exmoor [redacted] lies 168 km from the release site on the Isle of Wight, which equates to approximately three times the likely natal dispersal distance of translocated birds. It lies slightly closer to areas in Dorset, including Poole Harbour, where territorial eagles are now present, but still double the expected natal dispersal distance. Establishing a small breeding population on the Exmoor [redacted] and elsewhere in the region would therefore speed up the geographical expansion of the southern England population, particularly as wandering immature

birds would be more likely to stay if they encouraged a territorial unpaired bird. The restoration of Red Kites *Milvus milvus* to much of the UK was achieved through a series of well-planned reintroductions that have established various metapopulations in geographically distinct areas of the UK, and greatly speeded up the recovery of the species as a result.

The restoration of a breeding population of White-tailed Eagles in South West England would restore a key apex predator to the area after an absence of several centuries. In recent years the positive ecological impact of such species has become increasingly apparent through the principle of trophic cascades (Estes et al. 2011), and also as key indicator species (Helander et al. 2008).

Apex predators such as White-tailed Eagles have been shown to maintain balance in ecosystems through a range of factors. This includes predation of abundant mesopredators, including, for example, corvids (Lourenço et al. 2014). The Common Buzzard *Buteo buteo*, is now the most numerous bird of prey in Europe (Mebs and Schmidt 2006), and recent research has shown that nestlings of this species have been repeatedly observed as prey items in the nests of White-tailed Eagles breeding in Germany (Neumann and Schwarz 2017). Similarly, Common Buzzard nestlings were present as prey items in 9.2% of White-tailed Eagle nests sampled for prey items (n = 249) or in the nests of 17% of sampled White-tailed Eagle pairs (n = 53) in Lithuania. This constituted 2% of all prey items identified. It was significant that Common Buzzards were less frequently observed as a prey item in nests located in coastal areas (3.6%, n = 139), where Common Buzzard abundance is 11.5 pairs per 100 km² and alternative prey availability is high, compared to nests inland (16.4%, n = 110) where the corresponding figure can be as high as 82 pairs per 100 km² (Kamarauskaitė et al 2020). Previous studies have demonstrated that White-tailed Eagles adjust their diet according to local prey availability (Ekblad et al. 2016) and the Lithuanian study indicates that Common Buzzard predation is most likely in areas where the species is locally abundant and alternative prey is reduced. There was no evidence of White-tailed Eagles preying on other mesopredators present in the study area, such as Northern Goshawk *Accipiter gentilis*, Honey Buzzard *Pernis apivorus*, Lesser Spotted Eagles *Clanga pomarina*, Black Kites *Milvus migrans* and Red Kite,

indicating the local abundance of Common Buzzard, coupled with weak brood defence in the species, were key contributing factors (Kamarauskaitė et al 2020).

The broad diet of White-tailed Eagles, coupled with their tendency to take the most abundant prey items (Ekblad et al. 2016), means there is potential for them to supress the abundance of species at lower trophic levels, which may otherwise remain unchecked. This has been evident in the Netherlands where the diet of the expanding population of White-tailed Eagles during the breeding season consists predominantly of waterbirds (53%) and fish (28%) (van Rijn and Dekker 2016). Greylag Goose *Anser anser* constitutes 38% of the waterbirds taken with Coot (34%) the next most frequently caught species. The eagles predominantly target Greylag Goose goslings, although sick or injured adult birds are also taken. This has had the effect of reducing numbers of these feral geese in many areas (van Rijn pers. comm. 2019). Likewise, Canada Goose *Branta canadensis* has been the most frequently predated avian species in southern England since the Isle of Wight project began.

The White-tailed Eagle is also regarded as an important flagship species for wetland conservation across Europe (Sandor et al. 2015), acknowledging the notion that the conservation of charismatic top predators brings wider biodiversity conservation benefits (Sergio et al. 2006). The restoration of such an iconic species would help to raise the profile of the conservation and protection of coastal and estuarine habitats in South West England, which in turn may lead to knock on benefits for a much broader suite of threatened or declining species which share the same habitats. In this regard, the White-tailed Eagle could also be deemed an umbrella species, i.e. one whose habitat and area requirements are such that protecting it will aid a range of other species at the same time (Simberloff 1998). There is already evidence that the Isle of Wight reintroduction is facilitating and enhancing discussions about wetland restoration in southern England.

In addition to the conservation and ecological case for the reintroduction of the White-tailed Eagle to South West England, evidence suggests that it will also have economic benefits. In Scotland eagle tourism is extremely popular and recent RSPB commissioned reports have shown that the presence of White-tailed Eagles generates

up to £5 million to the economy of the Isle of Mull each year, and £2.4 to the Isle of Skye through visitor spend in the area (Molloy 2011).

1.5. Why Exmoor?

White-tailed Eagles have been regular visitors to South West England since the Isle of Wight project began. Analysis of these data show the core areas are Exmoor, Bodmin Moor and the estuaries of South Devon and South Cornwall, which all lie outside the expected natal dispersal distance of White-tailed Eagles released on the Isle of Wight.

Eight different White-tailed Eagles have visited Exmoor during the initial immature dispersal phase. During this period, the birds can be highly nomadic, and tend to linger in areas with high carrion or lagomorph availability. Later they gravitate towards wetland sites as they approach breeding age. These habits are illustrated by the movements of the satellite tagged birds on Exmoor. Most birds have favoured quiet inland areas, spending time perched on isolated trees on the open moor, in sheltered coombs or tree-lined valleys. It is notable that one bird, G405, spent prolonged periods on an upland farm where rabbits are abundant. This bird was also observed feeding on deer carcasses left out on the moor by supportive landowners. The young eagles have also frequented game shooting areas where there is an abundance of carrion. The project has developed an excellent working relationship with farmers and gamekeepers in areas where the eagles have lingered, as discussed further in Section 4 and Section 5, and there has been no conflict with either sector. It is significant that sheep farmers who expressed opposition to the project during the public consultation had not been visited by any of the Isle of Wight birds, whereas those in favour had experience of the birds in the Exmoor landscape.

The satellite tracking data gives a good indication of the areas likely to be favoured by young eagles released on Exmoor, and the presence of the birds has been extremely helpful in developing good relationships with a range of key stakeholders. However, evidence from the settlement patterns of the Isle of Wight birds, and those of White-tailed Eagles across their range, indicates that the key breeding area for birds in the

future, will be along the coast, as well as around large freshwater wetlands. The north coast of Exmoor, which extends for 37 miles, has the longest stretch of coastal woodland in England and Wales, covering an area of approximately 3000 hectares. Overall woodland accounts for 14% of land cover across Exmoor. This will provide many potential nesting sites for White-tailed Eagles, with numerous large mature trees, with easy access to the coastal waters where there is an abundance of favoured prey including grey mullet and European bass. [redacted] to ensure that the birds are released into optimum habitat, as on the Isle of Wight. It was very encouraging that during the early part of 2025, a female White-tailed Eagle, released on the Isle of Wight in 2019, spent several weeks on the Exmoor [redacted]

In time, the establishment of White-tailed Eagles on Exmoor will facilitate an eastward spread towards the Somerset Levels, where dispersing birds may encounter wild-fledged birds from Dorset, and south-west towards Cornwall. It is therefore a highly strategic location to assist the expansion of the southern English population.

1.6. Have the causes of extirpation been removed?

White-tailed Eagles were lost due to widespread persecution, beginning with the protection of fishponds in the early Middle Ages, and later, when the population was small in England, through the collection of specimens for taxidermy and theft of eggs for collections. Public attitudes have now completely changed and the return of iconic species such as the White-tailed Eagle generates genuine excitement among the general public. The White-tailed Eagle is increasing across Europe and reintroduction projects in Scotland and more recently, Ireland, have been successful. The Isle of Wight reintroduction project has caused considerable interest among the general public, and support is high. It is significant that support for the Isle of Wight project has increased since it began (Dunn 2022).

The White-tailed Eagle is now fully protected as a Schedule 1 species under the Wildlife and Countryside Act 1981 meaning it is an offence to intentionally or recklessly disturb it at, on, or near an active nest, or to shoot, poison or harm individuals at any

time of the year. Nevertheless, cases of ongoing and illegal persecution do still occur with the species in England, Scotland and Ireland. As such it will be essential to maintain a dialogue with those who may perceive eagles as an ongoing concern.

The RSPB's map of confirmed raptor persecution incidents shows that since 2007 there have been five confirmed cases of raptor persecution in Exmoor area. Although lower than some other parts of the country, this is indicative of the fact that illegal raptor persecution does still occur across England, and emphasises the importance of taking a proactive approach to the dissemination of information about the movements of the White-tailed Eagles after release. All of the eagles released as part of the project will be satellite tagged, and as with the ongoing Isle of Wight reintroduction, a proactive approach will be taken whereby efforts are made by members of the project team to contact land managers when satellite data shows that a bird has settled in a specific area. This will aid monitoring of the released birds and ensure that landowners are able to contact the project with any questions or concerns. The locations of birds will not be made public when they settle on private land in order to avoid disturbance to the birds or current land use. Satellite transmitters, manufactured by Ornitela, which will be used by the project are solar powered and as such should have significant longevity. Tags fitted to the three surviving birds released on the Isle of Wight in 2019 continue to give excellent data. The presence of multiple White-tailed Eagles in the Exmoor area since 2021 has meant the project team has already built positive relationships with a range of stakeholders, with no conflict occurring. The satellite tracking data proved invaluable in communicating each bird's movements to various landowners and other land managers in the area.

Although White-tailed Eagles are experiencing a population recovery in much of Europe, anthropogenic factors in addition to illegal persecution are still a cause of significant mortality. For example, Isomursu et al (2018) determined mortality factors of 123 White-tailed Eagle carcasses recovered in Finland during 2000-2014. They found that human-related factors accounted for 60% of the causes of death. The most significant was lead poisoning (31% of all cases) followed by human-related accidents (e.g. electric powerlines and traffic) (24%). The temporal and regional patterns of occurrence of lead poisonings suggested spent lead ammunition as the source. Lead shot was found in the gizzards of some lead-poisoned birds. Similarly, post mortem

examinations of more than 390 White-tailed Eagles found dead in Germany revealed that lead intoxication was the most important cause of death (23% of mortality) (Krone 2009). In these cases, scavenging behaviour exposes White-tailed Eagles to lead from spent ammunition. While it is illegal to use lead shot over wetlands in the UK, lead is still used for pheasant and partridge shooting, and, as such, juvenile White-tailed Eagles in particular are likely to be exposed to this after release. Monitoring of the Isle of Wight birds since release has shown that scavenged pheasants and partridges are an important element of the diet of first winter birds in particular. This is also the case in the Czech Republic (Belka and Horal 2009). However, as individual birds become adept at catching live prey the proportion of scavenged game carcasses in the diet declines in favour of live-caught prey, particularly fish. This shift in behaviour is described in further detail in Section 2. This likely limits lead accumulation, but it is an issue that is being closely monitored and any birds found dead will be tested for lead at post-mortem.

It is encouraging that the Health and Safety Executive has recently recommended a restriction on the sale and use of lead shotgun ammunition, with a transition timeline of five years. The phasing out of lead will be of significant benefit to White-tailed Eagles and other birds of prey, such as Red Kites and Buzzards. The project will closely follow these developments, and the Game and Wildlife Conservation Trust (GWCT) and the Greater Exmoor Shoot Association (GESA) will be invited to join the project steering group as a representatives of the game shooting industry. GWCT are members of the Isle of Wight steering group.

Collisions with power lines are another significant cause of mortality for White-tailed Eagles (Isomursu et al 2018), and this was the cause of death of a juvenile White-tailed Eagle on the Isle of Wight in August 2020, and a three-year-old male in Dorset in November 2024. There are no power lines in the vicinity of the release site for this reason.

White-tailed Eagles are also at risk of poisoning due to their tendency to scavenge carrion. Two of the birds released on the Isle of Wight have died due to poisoning: one after ingesting bendiocarb, an insecticide used illegally to poison raptors, and a second after it consumed seven times the lethal dose of brodifacoum, a second-generation

anticoagulant rodenticide (SGAR). Brodifacoum is only licensed for use around buildings and so under normal circumstances White-tailed Eagles should not come into contact with it. Two other potentially lethal SGARs, which can bioaccumulate in the food chain and cause secondary poisoning, bromadialone and difenacoum, were banned for use in open areas in July 2024 due to their risk to wildlife. Nevertheless, like brodifcaoum, there is still the risk that these SGARs will be used inappropriately. Education of land managers is thus of vital importance, and the project team have welcomed Natural England's efforts in this regard in the North Dorset area, where one of the eagles was killed innocently or otherwise. The project team will continue to work closely with relevant stakeholders to raise awareness of this important issue.

1.7. Have White-tailed Eagles been reintroduced elsewhere?

White-tailed Eagles have been reintroduced to Scotland, Ireland, the Czech Republic, and, most recently, on the Isle of Wight and in France and Spain. Although the project in the Czech Republic was a small-scale release of only nine individuals (Belka and Horal 2009), the projects in Scotland, Ireland and the Isle of Wight provide valuable models.

In Scotland an early release was undertaken on Fair Isle in 1968, and although it failed it was a valuable test of translocation, husbandry and release methods. A total of 82 Norwegian young were subsequently released on Rum National Nature Reserve between 1975 and 1985, and this led to the first successful breeding in 1985. The population was relatively slow to expand and so an additional 56 birds were released between 1993 and 1998 using improved techniques (Evans et al. 2003). By 2000, there were 22 breeding pairs and the 100th chick had fledged successfully. Since then the population in Scotland, predominantly in western parts, has expanded to more than 180 breeding pairs.

Following the successes in the west, 85 juvenile White-tailed Eagles were released on the east coast of Scotland between 2007 and 2012, with birds again imported from Norway. The first pair in eastern Scotland subsequently bred successfully in 2013, and there were four pairs in 2020 (O Selley pers. comm. 2020).



Figure 4. A juvenile White-tailed Eagle leaves the release pens on the Isle of Wight.

In Ireland, a total of 100 chicks were translocated to Killarney National Park in south-west Ireland between 2007 and 2012. By 2020 there were nine breeding pairs, of which four were successful that year, rearing five young. The breeding pairs included the first Irish-bred eagle to breed (A Mee pers. comm. 2020). Despite these initial successes a scientific review of the reintroduction project indicated the small population was still vulnerable to mortality factors such as Avian Influenza, illegal poisoning and extreme weather events. With this in mind a second phase of releases began in 2020 at sites including Lough Derg and Lower Shannon Estuary, situated 118 km and 62 km from the original release site respectively. These additional releases have continued at various locations for the past three years to give the Irish population the best possible chance of long-term success. This is in keeping with the approach we are proposing in southern England (Dennis et al. 2025).

The Isle of Wight reintroduction began in 2019 with the release of six juvenile eagles (Figure 4). To date a total of 37 birds have been released, and a pair of translocated eagles have bred successfully for the past two summers, rearing a total of three chicks. During the course of the Isle of Wight project the methods for the translocation,

husbandry and release of the young eagles has been refined, and this is outlined in Appendix 1. These experiences will be invaluable for the proposed Exmoor project.

1.8. What is the most appropriate donor stock?

The English population of White-tailed Eagles was from the nominate race *Haliaetus albicilla*, which is monotypic across Europe. This population would have once freely mixed with the White-tailed Eagles in other parts of the UK as well as mainland Europe.

In Europe, the breeding population is estimated to number 9,000-12,300 breeding pairs (BirdLife International 2015). Europe forms 50-74% of the global range, with a global population size estimated to be between 24,200 and 49,000 mature individuals. The general trend across Europe is for the species to be increasing, as shown in Table 1. In recent years White-tailed Eagles have returned to both the Netherlands and France, with small but expanding populations in both countries.

The ongoing reintroduction of White-tailed Eagles on the Isle of Wight involves the translocation of juveniles from Scotland. The existing NatureScot licence permits the collection of up to 12 birds per year, with a further 15 birds due to be released in 2025 and 2026.

A comprehensive analysis of predicted White-tailed Eagle population growth in Scotland was undertaken by Sansom et al (2016). At the time of writing, they reported that the number of breeding White-tailed Eagle pairs was growing almost exponentially, with wild-bred eagles greatly outnumbering released eagles. There has been a continued increase in both the proportion of White-tailed Eagle nests fledging young (i.e. ‘breeding success’) and the number of chicks fledged per breeding attempt (i.e. ‘productivity’) since the first breeding attempt in 1983, although the number of chicks fledged per breeding attempt appears to have remained relatively constant at an average of 0.67 chicks fledged per territorial pair since 2006. Density-independent predictive models suggested that the White-tailed Eagle population in Scotland could continue to grow to over 200 pairs by 2025 (Figure 5) and almost 900 pairs by 2040. Even when the impact of additional mortality, potentially caused by illegal killing and

collisions with wind farms, was incorporated into models, population growth was reduced, but not to the extent of causing a population decline (Sansom et al 2016).

The population growth predicted by Sansom et al (2016) based on values for the mean (± SD) number of fledglings produced per successful pair and survival gives a close fit to the observed population growth of White-tailed Eagles between 1975 and 2014, but like a previous model devised by Evan et al. (2009), it actually underestimated subsequent growth which saw the population increase to a minimum of 130 breeding pairs in 2018 (Figure 5), one year earlier than predicted by Sansom et al (2016).

A conservative estimate indicates the population has now reached approximately 180 breeding pairs, but it is thought that the true figure may be closer to 200 due to difficulties associated with surveying areas of remote and inaccessible coastline. If this is the case, it is very similar to the estimates of Sansom et al (2016) who predicated the population would be approximately 200 pairs in 2024 and reach 221 pairs in 2025 (Figure 5). This demonstrates that the removal of birds for translocation to the Isle of Wight has had no significant impact on continued population growth.

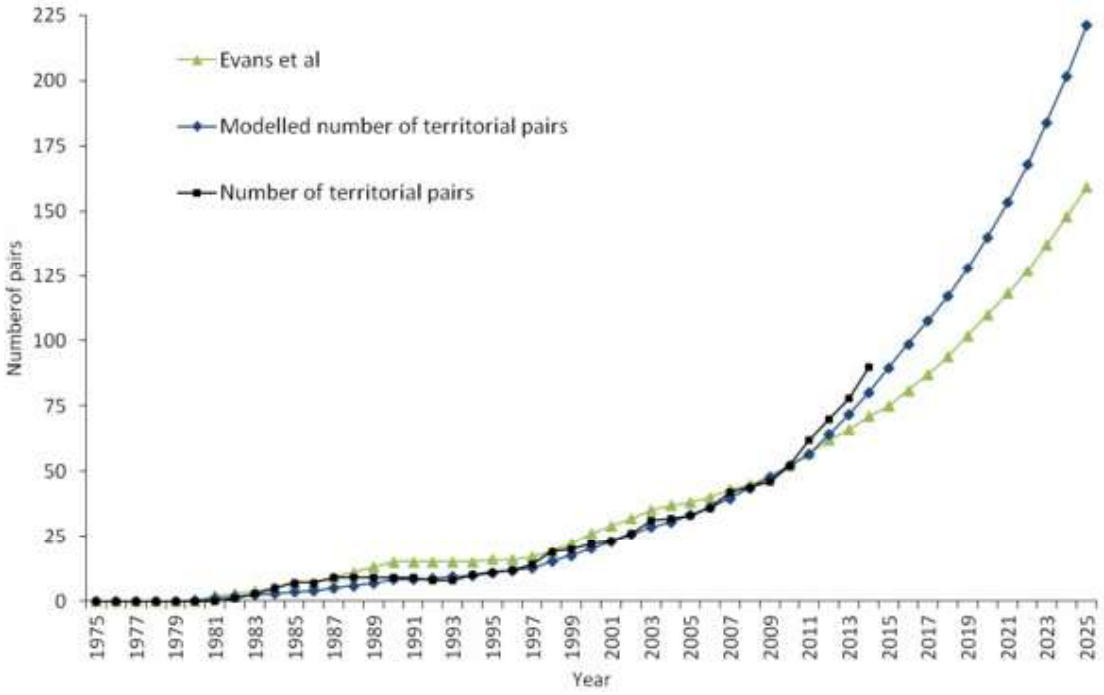


Figure 5 (from Sansom et al. 2016). Estimated population growth of White-tailed Eagles in Scotland until 2025 under two different modelled scenarios, as well as the observed number of territorial pairs in Scotland (black line, squares). *The*

previously best predictive model of future population growth (Evans et al. (2009); green line, triangles) provided a good fit to the observed population growth until approximately year 2010. However, a model that used up-to-date demographic rates from released and wild-bred birds, the overall proportion of territorial pairs that bred (mean ±SD from 1983-2014), the mean proportion of successful nests and the mean (± SD) number of chicks per successful attempt shows a better fit to the observed population trend (dark blue line, diamonds). The better fit of the updated model compared with the model by Evans et al. (2009) is due to an improved way of capturing the mortality of released first-year birds in the models.

The current Isle of Wight licence allows a further 15 chicks to be collected in 2025-26, with a maximum of 12 in a single year. Our view is that Scotland remains the most suitable donor stock for the Exmoor project, and given the nature of the small-scale releases proposed (up to 20 birds over three years), we believe it would be possible to begin the Exmoor project before the Isle of Wight releases are completed, subject to no more than 12 birds being collected in a single year. These birds would then be divided between the two sites. Furthermore, if another suitable release site can be identified, birds could be released at an additional location in the South West, over a further three-year period once the Isle of Wight phase is completed, subject to the necessary licences being in place.

The removal of 12 young each summer for the next five years would have a negligible effect on overall productivity of the Scottish population, reducing it from the expected 0.67 (based on Sansom et al. 2016) to a mean 0.61 if the more conservative estimate of 180 pairs is used as the start point (Table 1).

A reduction of this order would pose no risk to the donor population given the current and expected rate of population increase. Indeed, should the population continue to increase at a faster rate than expected, the overall impact of removing birds for translocation to southern England would be even less.

It is also important to consider that the project would be redistributing individuals within the United Kingdom, rather than removing them entirely from the population. Furthermore, the removal of ‘excess’ young may actually be beneficial to the Scottish population by reducing intraspecific competition in the most densely populated areas. In some localities, particularly the islands of Mull and Skye, there are many non-breeders, leading to an increase in intraspecific competition for nest sites and

evidence of fighting and even deaths between adults seeking breeding sites (Mee 2017).

Table 1. The effect of removing up to 12 White-tailed Eagle fledglings from the Scottish population over a five-year period between 2025 and 2029. *Population parameters are based on Sansom et al. (2016), using the current estimated 180 pairs as the starting point.*

Year	Expected pairs (based on 9.7% growth rate as per Sansom et al. 2016)	Expected fledged young (based on 0.67 fledged chicks per pair)	Number of fledged young after translocation	Productivity after translocation
2025	180	121	109	0.61
2026	198	133	121	0.61
2027	217	145	133	0.61
2028	238	159	147	0.62
2029	261	175	163	0.62

The collection of young will require a licence from NatureScot, as per the Isle of Wight project. Collection protocols would replicate the methodology already used for the Isle of Wight project, including, if required, the Avian Influenza protocol that was enacted for the first time in 2024 following consultation with Animal and Plant Health Agency (APHA) and NatureScot.

1.9. Legal requirements

The UK Government is required and encouraged to reintroduce extinct native species, as a signatory of the Rio de Janeiro Convention on Biological Diversity, the European Habitats Directive and the Berne Convention. The above proposal complies with the Recommendation No. R (85) 15 of the Council of Europe Committee of Ministers to Member States on the reintroduction of wildlife species, adopted in 1985.

At the International Conference Sea Eagle 2000 held in Sweden in September 2000, one of its eight resolutions was:

"**Encouraged** that White-tailed Eagle populations have recovered in major areas of the species' European range, but

noting with concern that this species is still endangered in many countries;

the International Symposium Sea Eagle 2000

recommends that this keystone species, valuable as an environmental indicator, requires effective conservation action to restore this species throughout its present and former range."

This project concurs with the above vision and would complement ongoing efforts to restore White-tailed Eagles through the southern half of Europe to the Mediterranean region.

As described above the project would require a licence from NatureScot to collect the birds in Scotland, as well as a licence from Natural England to release White-tailed Eagles at Exmoor as the species is listed on Schedule 9 of the Wildlife and Countryside Act 1981. Members of the project team already have the relevant licences from the British Trust for Ornithology to fit rings and satellite transmitters to the birds.

Under international conventions and directives, the White-tailed Eagle is classified as follows:

- EU Birds Directive: listed in Annex I - species to be subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution.
- CITES Convention: listed in Appendix I – trade in specimens of these species is permitted only in exceptional circumstances.
- Bonn Convention listed in Appendix I – endangered migratory species and listed in Appendix II - migratory species to be subject of agreements.
- Bern Convention: listed in Appendix II – strictly protected species.
- The White-tailed Eagle is specially protected in the UK under Schedule 1 of the Wildlife & Countryside Act 1981, and is also listed on Schedule 9.

White-tailed Eagles is also on the Amber List of Birds of Conservation Concern in the UK (www.bto.org/science/monitoring/psob).

2. The biological feasibility of a population reinforcement on Exmoor

2.1. Introduction

Exmoor is considered the most suitable location for the first-phase of the population reinforcement of White-tailed Eagles in South West England. Satellite tracking data has shown that eight different individuals have visited since May 2021, when G405 – now the breeding female in West Sussex – was present for the first time.

Exmoor lies a significant distance from the likely natal dispersal zone for the White-tailed Eagles released on the Isle of Wight, and, as expected, all of the eagles have visited during the initial immature dispersal phase, between the first and fourth calendar years. During this period, the birds can be highly nomadic, and tend to linger in areas with high carrion or lagomorph availability. Later they gravitate towards wetland sites as they approach breeding age. This is reflected in age-related changes diet, which sees a clear shift from carrion and small mammals, to fish, as illustrated in Figure 6.

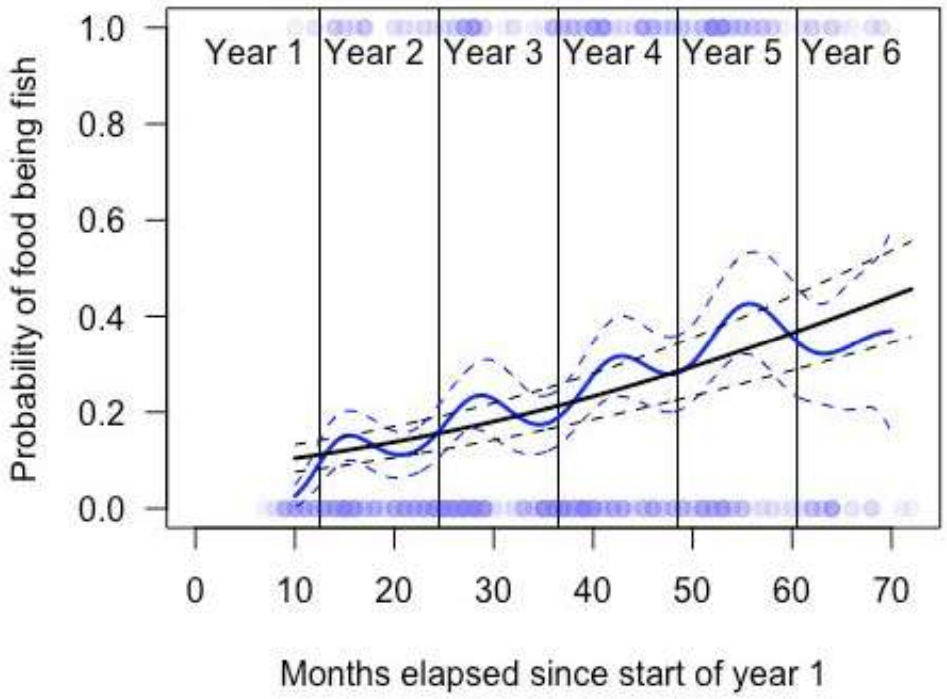


Figure 6. Age-related changes in probability of White-tailed Eagle food being fish.

As described earlier, these habits are illustrated by the movements of the satellite tagged birds on Exmoor (Figure 7). Most birds have favoured quiet inland areas, spending time perched on isolated trees on the open moor, in sheltered coombes or tree-lined valleys. It is notable that G405 spent prolonged periods on an upland farm where rabbits are abundant. She was also observed feeding on deer carcasses left out on the moor by supportive landowners. The young eagles have also frequented game shooting areas where there is an abundance of carrion. The project has developed an excellent working relationship with farmers and gamekeepers in areas where the eagles have lingered, as discussed further in Section 4 and Section 5, and there has been no conflict with either sector.



Figure 7. Movements of White-tailed Eagles in the Exmoor area since 2021.
Each bird is represented by a different colour (G405 = yellow; G486 = white; G542 = orange; G819 = cyan; G636 = purple; G704 = brown; G487 = green; G814 = pink).

The satellite tracking data gives a good indication of the areas likely to be favoured by young eagles released on Exmoor, and the presence of the birds has been extremely helpful in developing good relationships with a range of key stakeholders. However, evidence from the settlement patterns of the Isle of Wight birds, and those of White-tailed Eagles across their range, indicates that the key breeding area for birds in the future, will be along the coast. It was therefore extremely encouraging that White-tailed Eagle G819, which was released on the Isle of Wight in 2021, spent several weeks on the Exmoor [redacted] in early 2025.

2.2. Likely settlement patterns and nest site availability

Although young White-tailed Eagles are highly nomadic in their early years, the species is highly philopatric, with young birds usually settling to breed close to their natal site (Whitfield et al. 2009). In Scotland, the median age of recruitment to the breeding population was four years for males and five years for females, and median values for natal dispersal were 21–45 km in males and 47–58 km in females (Whitfield *et al.* 2009). This, however, varied according to the stage of the reintroduction project. Natal dispersal distances were identical among the males and females that bred following the first phase of releases; but as the population expanded, sex differences became more apparent with females dispersing further than males. This was exemplified by the fact that the mean terrestrial natal dispersal (i.e. straight-line distance between the release site and first breeding location minus any distance over sea) of breeding birds from the first Scottish release was 11 km for males and 11 km for females (full direct line distances (i.e. including areas of sea) 45 km / 47 km). The corresponding figures for wild-bred birds remained 11 km for males but rose to 26 km for females (full direct line distances 21km / 58 km).

It is reasonable to predict, therefore, that White-tailed Eagles released on the Exmoor [redacted] will settle to breed in the local area, within 50km of the release site. This has been observed in the early settlement patterns of eagles released on the Isle of Wight. There are currently three territorial pairs, located a mean 42 km from the release site.

White-tailed Eagles prefer trees close to water for breeding. In Scotland, they build nests in trees and on cliffs, but tree nests are preferred, and are usually sited in wooded areas close to water (median distance to water of tree nests = 0.2 km (n =19)) (Evans et al. 2010). [redacted] where the birds catch freshwater fish when provisioning young. Early nest building efforts by the [redacted] and at [redacted] have also been adjacent to wetland areas.

In Poland, which holds approximately 20% of the European population of White-tailed Eagles, breeding birds typically build nests in forests, and hunt in freshwater wetlands or along the coast. The size of the territory depends on food resources, but on average covers an area of approximately 60 km² (range = 19-115 km²) (Struwe-Juhl 2003). White-tailed Eagles nest linearly along the Polish coast, and a similar pattern of settlement is also evident along other linear landscape features, such as river valleys. For example, nests of individual pairs are located a mean 10.5 km apart, along a 50 km section of the Warsaw-Berlin Pradolina (D. Anderwald unpub. data.). Research has shown that White-tailed Eagles usually hunt within 3-5 km of the nest, but will also fly 9-20 km to reach rich fishing grounds (Fischer 1984, Mrugasiewicz 1984, Anderwald and Przybyliński 2011).

The north coast of Exmoor, which extends for 37 miles, has the longest stretch of coastal woodland in England and Wales, covering an area of approximately 3000 hectares (Figure 8). Overall woodland accounts for 14% of land cover across Exmoor. This will provide many potential nesting sites for White-tailed Eagles, with numerous large mature trees, with easy access to the coastal waters where there is an abundance of favoured prey including grey mullet and European bass. [redacted] to ensure that the birds are released into optimum habitat, as on the Isle of Wight.



Figure 8. Map showing woodland cover on Exmoor

The settlement patterns of White-tailed Eagles released on the Isle of Wight suggest that early territories will be fairly large, but will likely reduce in size over time. Evidence from Poland and elsewhere in the species' range, indicates there is space for at least three pairs along the Exmoor [redacted]. The Taw-Torridge estuary, situated approximately 40km south-west [redacted], is another likely breeding location for birds released on Exmoor. There is also potential for birds to settle further inland, with Wimbleball Lake and Clatworthy Reservoir, potential breeding locations. A translocated juvenile, G704, was present at Clatworthy Reservoir in early February 2025.

In time, the establishment of White-tailed Eagles on Exmoor will facilitate an eastward spread towards the Somerset Levels, where dispersing birds may encounter wild-fledged birds from Dorset. The core sites in the Somerset Levels are equidistant between the Exmoor release site and Poole Harbour, where a territorial pair are established. It will also encourage a south-westerly expansion into Devon and Cornwall.

2.3. Food availability

The release site has been selected due to its proximity to rich foraging areas along the Exmoor [redacted] which will provide a diverse array of potential food throughout the year.

Evidence from the Isle of Wight and mainland Europe indicates that fish will be the key prey item for breeding birds (Figure 6). A range of other prey items are also likely to be taken, including waterbirds and lagomorphs. A review of potential prey items has been undertaken by analysing the results of ongoing monitoring by different organisations.

2.3.1. Fish

Evidence from around Europe and from the Isle of Wight shows that fish is usually the primary food source for White-tailed Eagles during the breeding season (Cramp 1980;

Nadjafzadeh et al. 2015). It is likely that this will be the case for any breeding pairs that settle in the Exmoor area.

The Exmoor coastline and wider Bristol Channel supports seasonally abundant fish populations. Of particular note are three species of mullet which have proved to be important prey for White-tailed Eagles in southern England: Golden Grey Mullet *Chelon aurata*, Thick-lipped Grey Mullet *Chelon labrosus* and Thin-lipped Grey Mullet Chelon ramada. These species tend to congregate in large shoals in shallow water in estuarine and coastal habitat (Thomson 1986), and as such are relatively easy for White-tailed Eagles to catch. There is little information available on Grey Mullet abundance in UK waters as there is a lack of data collection on the species, but Thick-lipped and Thin-lipped Grey Mullet, in particular, are known to be widespread along the Exmoor coast and wider Bristol Channel area, including estuaries such as the Taw-Torridge (Butterworth and Burt 2018) and at Hinkley Point in Somerset (Henderson and Bird 2010). Likewise, Porlock Marsh and Steart Marshes in Somerset provide valuable habitat for grey mullet, as well as European Bass (Stamp 2021).

European Bass is another potential prey species of White-tailed Eagles. Adult European Bass tend to spend time offshore but juveniles (up to 4-5 years old) often reside in shallow coastal waters and estuaries (Jennings and Pawson 1992). Like grey mullet, European Bass are known to be widespread in the Bristol Channel (Stamp 2021; Figure 9) and as such, are likely to be a favoured prey species throughout the year. The Taw-Torridge estuary is one of 34 sites designated and protected as Bass Nursery Areas (BNA) (MAFF 1990). This designation also provides important protection for grey mullet. In addition, the Devon and Severn Inshore Fisheries and Conservation Authority (D&SIFCA) introduced a netting bylaw on 1st March 2018 to protect salmonids, bass, grey mullet and other species that use inshore areas for migration, as nurseries or for refuge.

A range of other marine species also occur along the Exmoor and wider Bristol Channel coast. Long-term monitoring at Hinkley Point, for example, logged a total of 83 species (Henderson and Bird 2010). Interestingly species abundance at this site increased over 28 years of sampling.

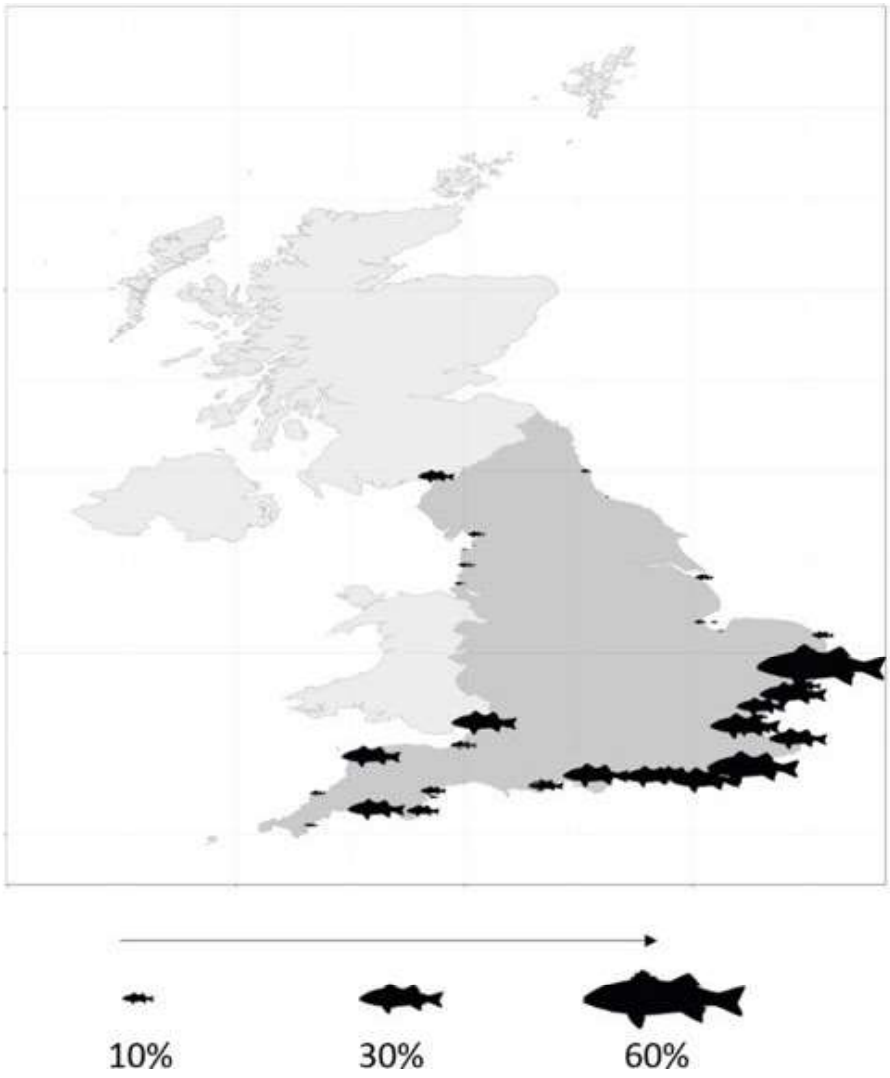


Figure 9 (from Stamp 2021). Average relative abundance (presented as percentage of total catch) of European Bass within Water Framework Directive Transitional and Coastal water bodies 1991-2019.

It is likely that White-tailed Eagles will parasitise fish from large gulls and Cormorants which are widely distributed across South West England. Kleptoparasitism is well documented in the genus *Haliaeetus* and White-tailed Eagles are known to steal fish from Otters in Western Scotland (D Sexton pers. comm. 2024) and flocks of fishing Cormorants and Goosanders in southern Sweden (Källander 2018). Kleptoparsatism has been regularly recorded among the eagles released on the Isle of Wight, particularly among older birds (Figure 10).

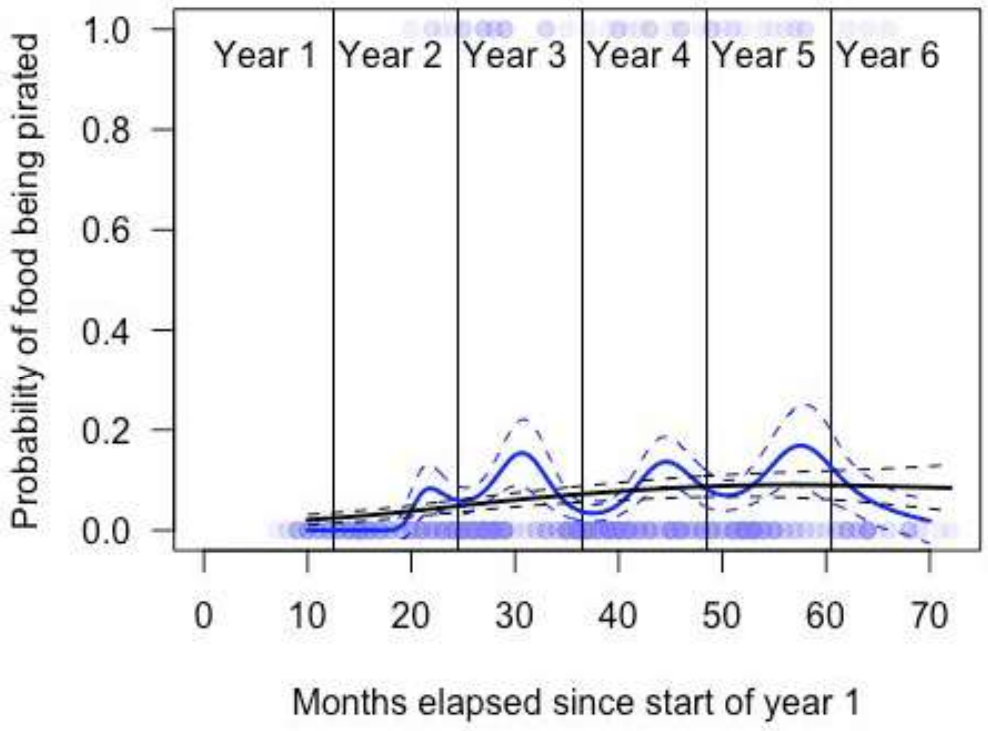


Figure 10. Age-related changes in probability of White-tailed Eagle food being acquired through piracy

In some European countries, such as Germany, many White-tailed Eagles breed in inland areas where they take an array of freshwater fish. Northern Pike accounts for up to 53% of White-tailed Eagle diet in Germany during summer months and 39% in winter, while the corresponding figures for Common Roach *Rutilus rutilus* are 44% in summer and 38% in winter (Nadjafzadeh et al. 2015). Similarly, in Lapland in northern Finland, fish accounted for 64.2% of prey brought to White-tailed Eagle nests in inland areas with Pike accounting for 49.8% alone. In the Netherlands Carp are the most commonly caught fish species (van Rijn and Dekker 2016). The pair of White-tailed Eagles that breed in West Sussex take a variety of freshwater fish, including Common Carp *Cyprinus carpio*, Common Bream *Abramis brama*, Northern Pike *Esox lucius*, European Eel *Anguilla Anguilla* and Roach *Rutilus rutilus*. White-tailed Eagles from the Isle of Wight have also been observed catching trout in other localities.

Two large reservoirs in the South-East of Exmoor, Wimbleball Lake and Clatworthy Reservoir, are stocked with trout, and also contain an array of other freshwater fish, including Roach, Bream and Pike (R. Wilson *pers comm.* 2025).

2.3.2. Cuttlefish

Common Cuttlefish *Sepia officinalis* have become a key prey item of White-tailed Eagles on the South Coast (Figure 11). They are caught from late February through to the end of August, when they are present in seagrass beds around the coast. As such, they are an important element of the breeding season diet. Cuttlefish are widespread along the North Devon coast, into Somerset, as well as being present in good numbers on the South Devon coast. This is reflected by the fact that Devon and Severn IFCA recorded the highest Cuttlefish landings of any IFCA district in 2019 (Blue Marine Foundation 2021). It is highly likely that Cuttlefish will be an important element of the diet of any White-tailed Eagles released on the Exmoor [redacted]



Figure 11. White-tailed Eagle G274 with a Common Cuttle fish on the Isle of Wight.

2.3.3 Waterbirds and other avian species

Waterbirds are the principal prey item of both breeding and wintering White-tailed Eagles in the Netherlands (van Rijn and Dekker 2016), and it is expected that they will also be important for White-tailed Eagles that settle to breed in the Exmoor area. Birds are usually captured on the water and on the ground, and sometimes on the wing (Nadjafzadeh et al. 2015). Waterbirds are more likely to be taken in winter when fish can be more difficult to catch.

Eagles usually target sick or injured birds and this is particularly the case with some of the larger species, such as geese. Canada Goose is a principal prey item of the eagles released on the Isle of Wight, and any adult birds taken are always compromised in some way, either through illness or injury. Similar behaviour has been observed in Denmark, where White-tailed Eagles are also known to target sick or dying geese and waterfowl (A. Fox pers. comm. 2019), and on the Isle of Mull in Scotland, where they have been observed caching adult Greylag Geese (D Sexton pers. comm. 2024). Greylag Goose goslings are a key prey item in the Netherlands (van Rijn and Dekker 2016), and also in southern England, where young Canada Geese and Egyptian Geese are also taken.

Significant numbers of Canada Geese occur in the Severn Estuary (five-year average peak count for English counties = 1228 with peak count made in January), Somerset Levels (696, November), Taw-Torridge Estuary (657, October), Dunster beach (195, August) and Wimbleball Lake (109, June) (Woodward et al. 2024). As such, like on the South Coast, Canada Geese are likely to be a key prey item.

Wigeon and Teal are species that are regularly predated in other parts of the species' range, including in the Netherlands (van Rijn and Dekker 2016). Very large numbers of Wigeon occur in the Somerset Levels (13,564, January) and Severn Estuary (5126, Feb – English counties) during the winter. They also occur in other locations, such as Taw-Torridge Estuary (597, Feb) and Dunster beach (308, Jan). Large numbers of Teal also winter at these locations with a five-year average peak count of 7388 (Feb) for the Somerset Levels and 3492 (Jan) for the English section of the Severn Estuary. Like Wigeon, Teal also occur in smaller numbers throughout the region, such as the

Taw-Torridge Estuary (487, March), as well as Porlock Marsh (76, December) and Dunster beach (56, March) (Woodward et al. 2024). In addition, resident wildfowl, such as Coot and Mallard are likely to be predated during the spring and summer. Black-headed Gulls and Herring Gulls are also regularly predated by White-tailed Eagles in southern England, and occur widely across the South West region (Woodward et al. 2024). Both species are therefore likely to be caught throughout the year, although White-tailed Eagles are known to avoid breeding colonies (D van Straalen pers. comm. 2019, A Fox pers. comm. 2019).

Waders are only occasionally taken by White-tailed Eagles, and evidence from other European populations indicates that they are more likely to favour waterfowl (Ekblad et al. 2016; van Rijn and Dekker 2016).

Corvids and Wood Pigeons have been favoured prey items of White-tailed Eagles from the Isle of Wight and it is very likely that this will also be the case in and around Exmoor. Corvids and Wood Pigeons are abundant in the region, and controlled in many areas.

2.3.4 Mammals

Although White-tailed Eagles will readily predate mammals, evidence from other parts of their European range indicates that in areas of high alternative prey availability, they usually constitute only a small proportion of the diet (Mlíkovský 2009; Sandor et al. 2015; Ekblad et al. 2016; van Rijn and Dekker 2016). However there has been a clear trend for birds released on the Isle of Wight to favour areas with high lagomorph populations, particularly in their early years. This has been the case on Exmoor, with young eagles often favouring areas with locally abundant rabbit populations. Adult eagles on the Isle of Wight also visit inland areas to catch rabbits when foraging at the coast is difficult due to weather condition, and also by the pair that have bred in West Sussex for the past two years.

Rabbits declined nationally since the turn of the century as a result of two strains of Rabbit haemorrhagic disease virus (RHDV1 and RHDV2) (Bell 2019), but appears to

have recovered in some regions and remains widespread and locally abundant on Exmoor. This has been evident in areas frequented by satellite tracked eagles. Recent research shows that RHDV2 has spread to hares, and may be causing increased mortality (Bell 2019), but like Rabbits, the species remains widespread around Exmoor. It seems very likely, therefore, that given the diet preferences of juvenile White-tailed Eagles from the Isle of Wight, and the importance of Rabbits, in particular, as a significant prey item for predatory raptors in the UK and other areas, such as Iberia (Lees and Bell 2008), that they will provide a key source of food for the released eagles in the Exmoor area.

The eagles will also eat mammal carcases, such as Fox and deer, left out in open areas as well as marine mammals and cetaceans washed up on tidelines.

2.3.5 Carrion

As a generalist forager, carrion often constitutes a key part of White-tailed Eagle diet (van Rijn 2010, Nadjafzadeh et al. 2015) and it is likely that carrion will be opportunistically taken throughout the year, particularly by young birds and in winter Nadjafzadeh *et al.* (2015) suggest that juveniles search more intensively for mammal carcasses during their wide-ranging flights, than adults which are more proficient at catching live prey. This has been borne out by the changes in diet observed among the Isle of Wight birds, which shows that the proportion of carrion in the diet declines with age, but is more important in winter, even among older birds (Figure 12).

Foraging eagles will regularly encounter bird carcasses in game shooting areas of Exmoor, and this will be particularly important for juvenile birds in their first winter, when they are less proficient hunters than older more experienced birds (Nadjafzadeh et al 2015). This trend has also been observed among dispersing birds from the Isle of Wight. Young eagles are often drawn to game shooting areas.

White-tailed Eagles readily feed on mammal carcasses. In Germany Wild Boar *Sus scrofa* carcasses – usually related to animals hunted as game – constitute 29.5% of White-tailed Eagle diet during winter (Nadjafzadeh et al. 2015). Although Wild Boar

are not present in the Exmoor area, immature birds from the Isle of Wight have been observed feeding on Fox *Vulpes vulpes*, and deer carcasses in several areas, including Exmoor.

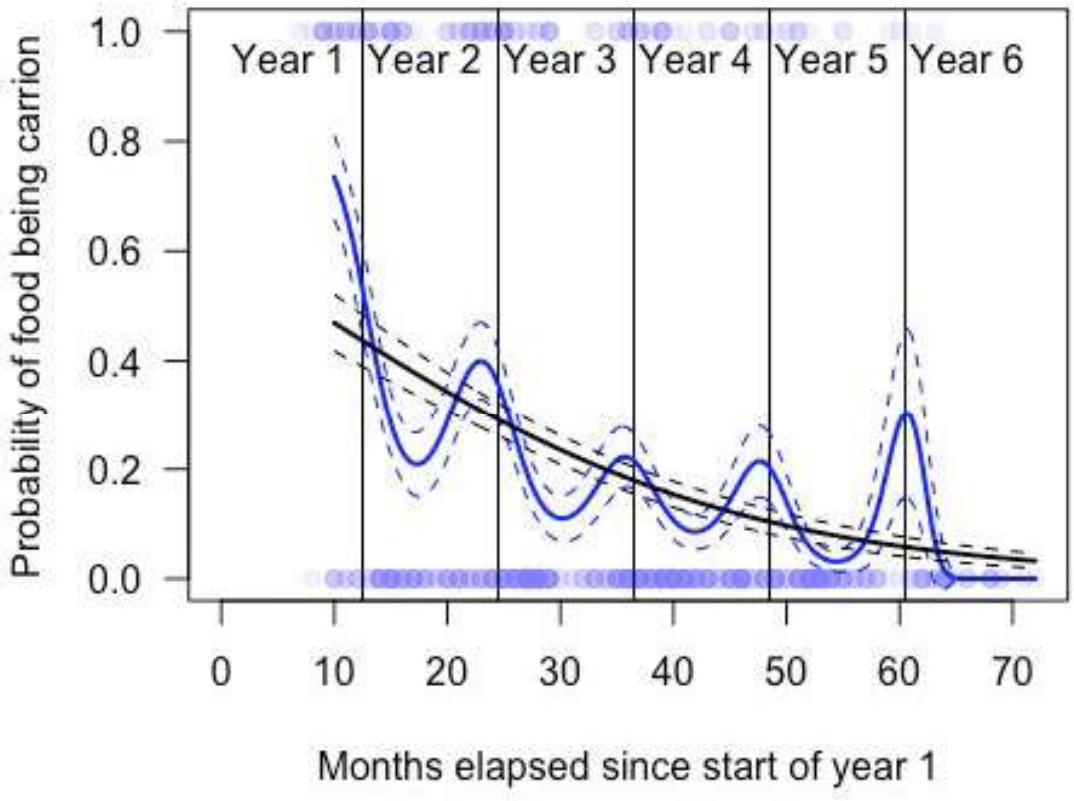


Figure 12. Seasonal and age-related changes in the importance of carrion in the diet of White-tailed Eagles from the Isle of Wight.

2.3.6 Conclusion

The broad diet of the White-tailed Eagle and the high abundance of various taxa along the Exmoor coast and in the wider South West region mean that prey availability will be high throughout the year. Considering evidence from across Europe and from the Isle of Wight reintroduction, the likely prey items and how they might vary through the year is outlined in Table 2 and in Figure 13.

Table 2. Likely key prey items in Exmoor wider South West region for an establishing population of White-tailed Eagles

Prey item	Availability	Comments
Marine fish, particularly Grey Mullet and European Bass	Year-round and particularly spring-late autumn	Widespread around the coast, and likely to be caught in shallow inlets and bays. Isle of Wight birds have continued to catch marine fish into winter – this is also likely to the case along the Exmoor coast.
Freshwater fish, particularly Northern Pike, Common Bream, Common Roach and Common Carp	Year-round	Locally abundant in some inland reservoirs and other wetlands. Favoured prey item in many parts of inland Europe.
Resident and feral geese – particularly Canada Goose	Year-round	Canada Goose in particularly is widespread and increasing. Goslings likely to be favoured in spring/summer, with sick or injured adult birds taken throughout year. Key prey item in the Netherlands and Isle of Wight.
Migratory ducks, particularly Wigeon and Teal	Winter	Locally abundant. Key prey item in the Netherlands and on the English South Coast.
Resident wildfowl, particularly Mallard and Coot	Year-round	Widespread
Gulls, particularly Black-headed Gulls and Herring Gulls	Year-round	Black-headed Gulls and Herring Gulls locally abundant throughout the year. Other gull species likely to be opportunistically taken.
Corvids	Year-round	Abundant. Adult and juvenile birds caught by IoW White-tailed Eagles since release
Scavenged game birds and wildfowl – Pheasant and Red-legged Partridge	Year-round, but especially winter	Shot, injured or sick game birds have been opportunistically scavenged or predated by IoW White-tailed Eagles, particularly during their first winter after release. Less important for older birds as their ability to capture live prey increases. Injured wildfowl may also be taken in areas where wildfowling occurs during winter.
Lagomorphs – Rabbit and Brown Hare	Year-round	Rabbits and Brown Hare locally abundant throughout the region. Rabbits, in particular, are favoured prey item of IoW White-tailed Eagles, particularly in early years.

Scavenged mammals and other carrion – deer, fox etc.	Year-round	Deer carcasses may be encountered by young eagles, particularly in winter.

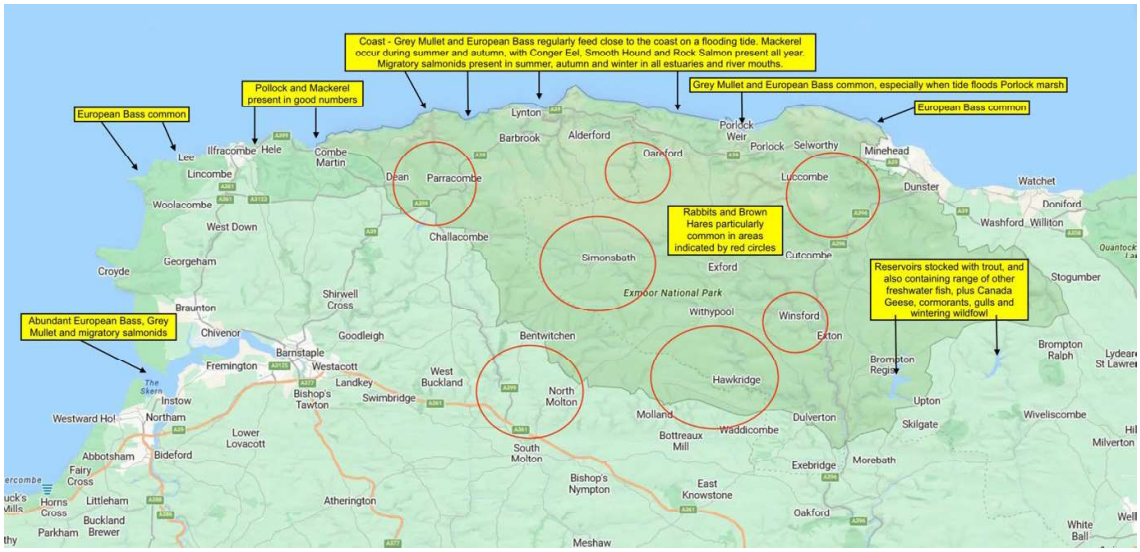


Figure 13. Map showing key areas of prey availability in and around Exmoor. *Red circles show areas with high lagomorph abundance.*

2.4. Future population expansion in South West England

The Exmoor project is the first in a series of three proposed releases of White-tailed Eagles in South West England. It is a highly strategic location that will facilitate expansion across the region. Further releases, likely in South Cornwall and South Devon will enhance this further.

Given that White-tailed Eagles have delayed sexual maturity, the colonisation of South West England will be relatively slow, even with releases in three locations. This is exemplified by the fact that it has taken almost 50 years for the Scottish population to reach its current level of 180 breeding pairs (the first releases were in 1975). Monitoring indicates that the Scottish population is now growing at a faster rate (Figure 5), although there are indications that local populations may have reached carrying capacity in some areas, with increased instances of intra-specific aggression and killing of rival birds noted in recent years (D Sexton pers. comm. 2020). This may be an early sign of density dependent population regulation.

In an extremely well-studied population of White-tailed Eagles in the region of Schleswig-Holstein in northern Germany, the density of breeding eagles in optimum habitat is 1.4 pairs per 100 km² (Krüger et al. 2010), but lower in less favourable areas (0.3 pairs per 100 km²). Thus, the expected carrying capacity of Schleswig-Holstein as a whole (15,763 km²) is 122 pairs. Like in Scotland, Krüger et al. 2010 predict the current rate of population growth will slow over time as density dependent processes begin to act on the population. In Poland, the average territory size is approximately 60 km², but ranges from 19-115 km² (Anderwald et al 2013).

We expect the population in southern England to be predominantly coastal with some additional pairs breeding further inland, close to freshwater wetlands. This means that the population density and overall carrying capacity will be lower than that observed in Germany and Poland where numerous large inland lakes support very high numbers of breeding pairs. The distribution of breeding pairs is more likely to resemble coastal regions of Poland, with breeding pairs situated every 10-15 km.

The South West coastline covers over 600 km from Exmoor to Poole Harbour thus it might be reasonably expected that 50 pairs of White-tailed Eagles will eventually breed at intervals along the coast, with smaller numbers around some inland wetlands, such as Colliford Lake on Bodmin Moor, which like Exmoor has been visited by multiple birds from the Isle of Wight.

In view of the timescales involved in the project, it is important to consider whether climate change could have an effect on the future biological suitability of the region. This is highly unlikely to be the case given that breeding White-tailed Eagles occupy a broad geographical range, from Turkey and Iran to Greenland and Arctic Russia, with differing climatic conditions (Birdlife International 2021). This demonstrates their ability to successfully exploit seasonally available food sources that vary with geography and climate.

2.4.1. Monitoring of breeding sites

All released birds will be closely monitored in the field and by satellite tracking. It will be particularly important to monitor any breeding activity and to liaise directly with all relevant stakeholders to ensure that any nests are not disturbed. This will be done on a case-by-case basis as the population develops. The project team has extensive experience of monitoring and protecting breeding raptors, and building relationships with landowners and other key local stakeholders in this way, and does not publicise locations in sensitive areas in order to protect the birds and prevent disturbance. This approach has been taken with the birds released on the Isle of Wight when they settle in a new area, and has been welcomed by landowners. The project team will encourage local licenced raptor workers to assist with monitoring of nests and liaison with landowners and other land managers as the breeding population expands geographically.

In Poland and other European countries buffer zones are established around raptor nests in some areas, such as state forests, to prevent disturbance to breeding pairs, although they are not required in areas of private land. The size of buffer zones vary from country to country but are typically in the range of 300-500 metres during the breeding season, with forestry work prohibited. Our experience is that the best approach in England is to assess nests on a case-by-case basis depending on local factors such as topography, vegetation cover, land-use and public access, to ensure that breeding eagles are not disturbed, but present land-use is unaffected as much as is reasonably possible. It should also be noted that in some parts of Europe White-tailed Eagles have become increasingly tolerant of human activity (Helander and Sjernberg 2002), and White-tailed Eagles also nest close to well-used footpaths on the Isle of Mull in Scotland (D Sexton pers. comm. 2018). This is also the case with the nest in West Sussex, where the breeding pair are very tolerant of normal day-to-day activities on the land on which they breed, and no changes have been required.

The establishment of public viewing sites will be an important means by which to manage eagle visitors and ensure that other outlying nests are no disturbed. Such an approach has been undertaken with great success with nesting White-tailed Eagles on the Island of Mull, which diverts attention from other nests on the island. Boat trips

at places such as Poole Harbour demonstrate there is significant interest in White-tailed Eagles in southern England.

2.5. Conclusion

The ability of the White-tailed Eagle to breed successfully in anthropogenic landscapes across Europe is highly encouraging. The abundant food supplies in coastal areas of South West England, coupled with potential nest sites in woodlands, copses and even on isolated trees mean that the aim of establishing a self-sustaining population is eminently achievable, with breeding success likely to be higher than in western Scotland due to a greater abundance of natural food and more favourable weather conditions. It will be important to work closely with all key stakeholders when White-tailed Eagles become established in an area and the project team is fully committed to this long-term plan.

3. The ecological impact of a White-tailed Eagle reinforcement on Exmoor

3.1. Introduction

When considering the potential ecological impact of a small-scale release of White-tailed Eagles on Exmoor, it is essential to consider that the birds are already present in the landscape. Eight different individuals have spent varying lengths of time in the area since the Isle of Wight project began, and this has included two long-staying birds, which have made repeat visits, as detailed later, in section 4.2.1.3. The project is therefore not reintroducing a novel species into the area, and there have been no negative impacts associated with the presence of the birds that have visited. In addition, detailed satellite tracking data has provided valuable information on how the birds have lived in the landscape. Although these data mainly relate to young birds in the immature dispersal phase, it nevertheless provides key information on how released juveniles will behave. Satellite tracking data from individuals which have begun breeding, or established territories, on the South Coast, also provides an extremely useful insight into the likely settlement patterns and behaviour of breeding birds in the Exmoor area.

It is also important to consider that in recent years the positive ecological impact of White-tailed Eagles and other apex predators has become increasingly apparent through the principle of trophic cascades (Estes et al 2011), and also as key indicator species (Helander et al. 2008). The White-tailed Eagle is also regarded as an important flagship species for wetland conservation across Europe (Sandor et al 2015); thereby corroborating the notion that the conservation of charismatic top predators brings wider biodiversity conservation benefits (Sergio et al 2006).

As described in Section 2 the White-tailed Eagle is a generalist predator with a broad diet that varies spatiotemporally within the landscape (Dementavičius et al. 2020) and according to the most seasonally abundant prey (Ekbald et al 2016). There have been numerous studies on its diet in northern Europe (e.g. Cramp 1980; Sulkava et al 1997; Horváth 2003; Marquiss et al. 2004; van Rijn et al. 2010; Sandor et al. 2015; Ekbald et al. 2016). No quantifiable negative effects have been demonstrated; almost certainly

because the species targets the most locally abundant food source and also readily takes sick and injured individuals, as well as carrion.

There have been suggestions that predation by White-tailed Eagles may have contributed to population declines in Common Eider *Somateria mollissima* in parts of the Baltic Sea (Ekblad et al. 2020), but predation by non-native American Mink has been shown to be an increasing problem (Öst et al. 2018) and a propensity for female eiders to skip breeding could not be reliably attributed to the abundance of White-tailed Eagles (Öst et al 2018). Furthermore, as an apex predator White-tailed Eagles have the potential to suppress the abundance of mesopredators, such as American Mink. They are known to predate American Mink in the region and female mink modify their behaviour according to eagle predation risk (Salo et al. 2008). As such the recovering White-tailed Eagle population may have positive long-term cascading effects on lower trophic levels including bird, mammal and amphibian populations in the archipelago (Salo et al. 2008).

Dementavičius et al (2020) made a specific effort to assess the threat of White-tailed Eagles to species of conservation concern in Lithuania by analysing prey remains recovered from White-tailed Eagle nests between 1987 and 2018. Overall, the dataset comprised 2,373 prey items from 302 successful breeding attempts of 60 White-tailed Eagle pairs, which represents approximately one-third of the Lithuanian population. Fish were the most common prey, comprising 62% of sampled remains, followed by waterbirds (24%), terrestrial birds (10%) and mammals (4%). Northern Pike was the most abundant single species, constituting 19% of all identified prey and being detected in 47% of nests. It was followed by Common Bream (10%), while Eurasian Coot (7%) and Mallard (4%) were the most frequent bird species. Only a very small percentage of predated species were those of conservation concern, which corroborates the notion that White-tailed Eagles predate the most numerous and readily available species in the landscape. Seven of 57 bird species taken as prey are included in Annex I of the EU Birds Directive, but this amounted to just 21 individuals (i.e. 3% of overall avian total, and 1% of all available prey), of which 14 were either Common Crane *Grus grus* (7) or White Stork *Ciconia ciconia* (7) – both abundant and widespread species in Lithuania. Individuals of other protected species occurred only very occasionally. Similarly, only 19 individuals of five species listed as vulnerable in

the IUCN European assessment were recovered from nests, 11 of which were Lapwing, while a single Bewick's Swan *Cygnus columbianus* was the only endangered species identified as prey. Dementavičius et al (2020) concluded therefore, that the recovered White-tailed Eagle population (125-150 pairs (Birdlife International 2015)) in Lithuania, does not limit populations of bird species of conservation concern, with most of these species described as 'marginal alternative prey', being locally scarce compared to the preferred fish and frequently taken, locally abundant waterbirds.

In some areas White-tailed Eagles are known to have a positive effect by exerting top-down control of species such as Greylag Geese, where populations would otherwise remain unchecked and continue to grow in the absence of a natural predator (van Rijn and Dekker 2016). Greylag and Canada Geese may have a detrimental effect on the wider ecosystem through interspecific competition for food and nesting habitat with other less dominant species, and over-abundance also creates potential conflict with socio-economic interests (Tulloch et al 2017).



Figure 14. Map showing location of SACs and a 50km buffer around the proposed release site.



Figure 15. Map showing location of SPAs and a 50km buffer around the proposed release site.

When considering any population reinforcement, it is important to consider potential impacts on the local ecosystem; and, specifically, to ensure that there will be no negative impact. As part of the licensing process Natural England will undertake a Habitat Regulations Assessment on all the local SACs (Figure 14) and SPAs (Figure 15) that may be affected either positively or negatively from the reintroduction. Here we consider the potential ecological impact of the population reinforcement, particularly with regard to key conservation issues and designations in the region. We have paid particular attention to the area of expected natal dispersal of the translocated birds (i.e. within 50 km of the release site as per Figure 14 and Figure 15). It is also important to consider that White-tailed Eagles are already present in this area, and have visited these areas, with no negative impacts.

3.2. Waterbird assemblages

There are two significant Special Protection Area (SPA) sites which lie on the eastern extremity of the likely natal dispersal area of White-tailed Eagles released on Exmoor.

The Severn Estuary SPA is designated for its very large winter water bird assemblages (c. 84,000 birds), and for wintering populations of the species listed in Table 3.

Table 3. Species referred to in SPA designation of Severn Estuary

Species	Population size
Gadwall *Anas strepera*	282
Greater White-fronted Goose *Anser albifrons albifrons*	2664
Dunlin *Calidris alpina alpina*	44624
Bewick's Swan *Cygnus columbianus bewickii*	280
Common Shelduck *Tadorna tadorna*	3330
Redshank *Tringa totanius*	2330

Similarly, the Somerset Levels is designated for its large waterbird assemblages (c. 73,000 birds) and for wintering populations of the species listed in Table 4.

Table 4. Species referred to in SPA designation of Somerset Levels

Species	Population size
Teal Anas crecca	13,307
Bewick's Swan *Cygnus columbianus bewickii*	191
European Golden Plover *Pluviallis apricaria*	3029
Northern Lapwing *Vanellus vanellus*	36,316

In view of this, it is important to assess the potential impact of White-tailed Eagles on these wintering bird assemblages. This may occur in two ways: through direct predation and, secondly, disturbance.

Given the very large populations of migratory wildfowl, swans and geese which occur on the Severn Estuary and the Somerset Levels, the limited food requirements of a small population of White-tailed Eagles during winter and the species' penchant to favour the most seasonally abundant prey (Ekblad et al. 2016) it seems likely that predation will have a negligible effect and certainly no discernible impact at a population level.

Evidence from the Isle of Wight and elsewhere in Europe indicates that hunting eagles tend to target injured, sick or dying waterfowl when foraging. This is the case in Denmark where there is a rapidly increasing population of over 100 pairs of White-

tailed Eagles (A. Fox pers. comm. 2019). The sheer size of the waterbird assemblages that occur on both the Severn Estuary and Somerset Levels means foraging White-tailed Eagles will regularly encounter sick, dead or dying birds, which will invariably be individuals of the most abundant species. White-tailed Eagles predate both dabbling and diving ducks across their European range (Nadjafzadeh et al. 2015, Ekblad et al. 2016, van Rijn and Dekker 2016), and always favour the most numerous and widespread species. Thus, although species such as Teal and Wigeon (5-year average winter count on Somerset Levels = 13,564 (Woodward et al. 2024) may be taken, this will have no impact at either a local or population level. The abundance of alternative prey means it is highly unlikely that a small reintroduced population of White-tailed Eagles, which predominantly target weaker individuals - which ultimately may die anyway - could exert population level impacts on species such as Greater White-fronted Goose or Bewick's Swan. This is corroborated by the findings of Dementavičius et al (2020) in Lithuania, who, as described above, found that White-tailed Eagles had no negative impacts on species of conservation concern.

Canada Goose and Coot are the most frequently taken avian species by White-tailed Eagles released on the Isle of Wight. This reflects the abundance of both species in Southern England. The Canada Goose is a non-native species that is known to cause damage by overgrazing (Manchester and Bullock 2000) and so predation of this species by White-tailed Eagles has the potential to result in local ecological benefits.

Evidence from various studies of White-tailed Eagle diet indicate that waders such as Northern Lapwing are less likely to be taken than ducks and geese, and these species are far more likely to be predated by Peregrines *Falco peregrinus* instead. For example, an analysis of prey remains of wintering White-tailed Eagles in the Netherlands demonstrated that although species such as Lapwing and Redshank are occasionally taken, White-tailed Eagles predominantly favour ducks and geese (van Rijn et al 2010). This has been corroborated on the South Coast of England, with waders accounting for less than 1% of prey items recorded, based on over 730 observations of eagles feeding.

In addition to direct predation of wintering birds, there may be some concern that a reintroduced population of White-tailed Eagles could exert additional pressure through

disturbance. Disturbance can mean, in its broadest sense, any event that leads to a change in behaviour or physiology (Collop et al. 2016). It may lead to cause a variety of responses, ranging from a simple reduction in feeding time (Gill et al. 1996) to increased energy expenditure through locomotion (Houston et al. 2012), or in the most extreme cases – usually the result of anthropogenic disturbance – displacement from favoured foraging grounds (Burton et al. 2002). It is important to consider, however, that, unlike anthropogenic disturbance, attacks by a native predator are a normal occurrence for wintering bird assemblages, and that the migratory species that occur in South West England will encounter White-tailed Eagles elsewhere in their migratory range and in Southern England.

Evidence from the Netherlands indicates that disturbance to wildfowl and waders by the White-tailed Eagles is similar to that caused by Peregrines and Greater Black-backed Gulls *Larus marinus*, and wintering birds become accustomed to their presence (D. van Straalen pers. comm. 2019). Another important consideration is that White-tailed Eagles are often inactive for long periods. A study in Germany found that White-tailed Eagles allocated 93.2% of their diurnal time perching or standing (Nadjafzadeh et al. (2016). The authors conclude that this 'sit-and-wait' for prey strategy seems to be a low-cost, highly profitable foraging mode in eagles and is similar to behaviour reported for the closely related Bald Eagle *Haliaeetus leucocephalus* which was found to spend 94.3% of diurnal time perched (Watson et al. 1991). A recent analysis of the behaviour of the White-tailed Eagles released on the Isle of Wight corroborates these findings, with birds perched for >85% of each day. This behaviour means that disturbance from White-tailed Eagles is less regular than other avian predators such as Peregrine, Marsh Harrier *Circus aeruginosus* and Greater Black-backed Gull which are on the wing for longer periods each day, hunt by active flight, and are already widespread around the Severn Estuary and wider region.

Disturbance by White-tailed Eagles is not considered an issue by Dutch researchers at internationally important wetland sites such as Krammer-Volkerak (https://eunis.eea.europa.eu/sites/NL1000021) (D. van Straalen pers. comm. 2019). Similarly, monitoring at sites such as Newtown Harbour on the Isle of Wight, and Poole Harbour in Dorset has demonstrated that wintering birds become habituated to the

regular presence of White-tailed Eagles and this further reduces the potential for disturbance (Figure 16).



Figure 16. Species such as Dark-bellied Brent Geese, Oystercatcher and Curlew have become accustomed to the regular presence of White-tailed Eagles at Newtown Harbour NNR on the Isle of Wight, where hunting eagles employ the 'sit-and wait' technique, by perching on fence posts in the estuary.

One possible cause of anthropogenic disturbance indirectly related to the presence of White-tailed Eagles might be birdwatchers or other members of the public attempting to view the eagles in areas with large winter bird assemblages. As such people eager to see eagles will be directed to sites with suitable visitor infrastructure. This issue will be covered in the project's Visitor Management Strategy which will be agreed with Natural England in advance of any birds being released.

3.3. Breeding seabirds

The Exmoor coastline supports breeding seabirds on cliffs at various sites to the west of Lynton. The breeding population was surveyed as part of Natural England's seabird survey in 2016, and the results are shown in Table 5.

Table 5. Results of Natural England Seabird Survey 2016

Location	Guillemot *Uria aalge*	Razorbill *Alca torda*	Fulmar *Fulmarus glacialis*	Kittiwake *Rissa tridactyla*	Shag *Gulosus aristotelis*
Cow and Calf	1308	181	28	81	
Elwill Bay		33	6		1
Highvear Point	53	178	1		2
Lynton 1 & 2	361	58	16		
Woody Bay	130	57	58		
Wringapeak	854	216	55	59	
Wringcliff Bay 1			48		
Wringcliff Bay 2 & 3		3			
Totals	**2706**	**726**	**212**	**140**	**3**
Location	**Greater Black-backed Gull** *Larus marinus*	**Lesser Black-backed Gull** *Larus fuscus*	**Herring Gull** *Larus argentatus*		
Cow and Calf			14		
Elwill Bay					
Highvear Point	1		10		
Lynton 1 & 2			3		
Woody Bay		1	18		
Wringapeak	1		15		
Wringcliff Bay 1					
Wringcliff Bay 2 & 3			4		
Totals	**2**	**1**	**64**		

Of the various seabirds which breed along the Exmoor coast, evidence from elsewhere in the species range indicates that Fulmar is the most likely to be predated by White-tailed Eagles. Fulmar is a regularly recorded prey item in Scotland, accounting for up

to 30% of prey remains recovered from nests (Reid et al. 2023). Nevertheless, this should be viewed within the context that White-tailed Eagles favour the most abundant local food source, with diet varying spatiotemporally across the landscape. The UK population of Fulmars is approximately 350,000, of which approximately 97% occur in Scotland (BTO 2025) and they are extremely numerous in areas where they are predated by White-tailed Eagles, most notably in Harris and Lewis, the Uists, Skye and the north-west mainland (Reid et al. 2023). Furthermore, there is a lack of fish in many parts of Western Scotland, as demonstrated by limited fish remains in nests (Red et al. 2023). Fulmar has not been recorded in the diet of any of the White-tailed Eagles released on the Isle of Wight, even though there are small numbers of breeding pairs along the Purbeck coast in Dorset, where eagles regularly occur. Furthermore, there has been no other predation of other seabirds on the South Coast, despite there being a Kittiwake colony in West Sussex, Guillemots on the Needles on the Isle of Wight, and Puffins on the Purbeck coast.

Thus, the White-tailed Eagles' preference to take the most seasonally abundant prey means that foraging eagles on the Exmoor coast are much more likely to target abundant marine fish such as Grey Mullet and European Bass, than hunt Fulmars, or other seabirds, which occur in much lower numbers than in areas where they are predated in Scotland.

3.4. Rare fish

Fish constitute a key part of the White-tailed Eagle's diet across its European range, and so it is important to consider the associated ecological impacts. The [redacted] nature of the proposed release site means that marine fish are likely to be taken by sub-adult birds as well as established breeders. The very nature of the White-tailed Eagle's foraging habits mean that they are likely to target the most seasonally-abundant and easily-caught species, such as Grey Mullet and European Bass, as also observed elsewhere in Southern England. Whilst it is highly unlikely that a reintroduced population of White-tailed Eagles could have any discernible impact on these species, there is potential for other marine species to be caught.

Two of the Special Areas of Conservation (SAC) designations in the expected natal dispersal zone of White-tailed Eagles released on Exmoor, relate to the presence of rare fish species. Sea Lamprey *Petromyzon marinus*, River Lamprey *Lampetra fluviatilis* and Twaite shad *Alosa fallax* are Annex II species listed as a primary reason for site selection of the Severn Estuary SAC, while Twaite Shad is a primary reason for site selection of Camarthen Bay and Estuaries SAC. Sea Lamprey, River Lamprey and Allis Shad *Alosa alosa* are also listed as Annex II species as a qualifying feature of the latter site.

The Sea Lamprey is a is a primitive, jawless fish resembling an eel. It is migratory and spends most of its life at sea, before entering rivers to spawn, after which it dies. The smaller River Lamprey, spends its adult life in estuaries and around the coast, and then also spawns in rivers, where like the Sea Lamprey it favours clean, sandy gravel beds. The Twaite Shad is a rare, relatively small marine fish, which rarely exceeds 40cm in length. It returns from the sea to spawn in rivers in spring, usually between May and June, and many adults die after spawning. The very similar Allis Shad is slightly larger, and grows in coastal waters and estuaries before migrating into rivers to spawn. Like the Twaite Shad it spawns at night and almost all adult fish die after spawning (JNCC 2025). These migratory fish were severely impacted by the installation of Victorian navigation weirs which blocked access to favoured spawning grounds. However, in recent years the installation of fish passes has allowed these species to travel further upstream once again, which should enable populations to recover.

Spawning fish typically prove relatively easy prey for White-tailed Eagles, but these rare species are unlikely to be caught while they are upstream in rivers because hunting eagles usually prefer larger more open expanses of water, as observed elsewhere in the European range (Nadjafzadeh et al 2015, Källander 2018). Furthermore, the availability of alternative marine fish which occur in much larger numbers, such as Grey Mullet and European Bass, makes predation of the rarer species unlikely even when they are present in estuaries or along the coast because, as described previously, White-tailed Eagles favour the most seasonally-abundant prey. Grey Mullet are particularly easy for White-tailed Eagles to catch because they

are slow moving and frequent shallow water along the coast and in estuaries, often congregating in shoals.

During the public consultation concerns were raised about potential impacts on Atlantic Salmon *Salmo salar*. Numbers of salmon returning to rivers in the region are low, although Exmoor National Park have been involved in efforts to improve access to key spawning areas through the installation of fish passes, such as at Bridgetown Weir, which it is hoped will help to boost numbers (https://www.gov.uk/government/news/new-fish-pass-unlocks-exmoor-national-park). As with other rare species, it is highly unlikely that salmon will be targeted by White-tailed Eagles due to low numbers and the fact that hunting eagles usually favour more open expanses of water.

Opportunities for freshwater fishing in the area where initial settlement is expected are relatively limited, although Clatworthy Reservoir and Wimbleball Lake on Exmooor may be visited by foraging White-tailed Eagles. These reservoirs are stocked with trout and also contain a range of other freshwater species such as Northern Pike, Roach and Bream, which may be caught by White-tailed Eagles. European studies have shown that a range of freshwater fish are taken according to availability but favoured species include Northern Pike, Roach, Bream and Carp, with fish accounting for up to 50-60% of the diet during summer (Nadjafzadeh et al. 2015, van Rijn and Dekker 2016, Ekblad et al 2020). Freshwater fish are also a key component of the diet of the White-tailed Eagles breeding in West Sussex, with carp, Northern Pike, Roach, Common Bream and European Eel all recorded, particularly when provisioning small chicks.

Although freshwater fish may be taken by White-tailed Eagles at Clatworthy Reservoir and Wimbleball Lake and other freshwater wetlands in the region, it is highly unlikely that this will have a detrimental impact on fish populations given the generalist diet of the species, the fact they favour the most seasonally abundant species, and that these sites are only likely to support isolated breeding pairs.

3.5. Egrets and cranes

The recovery of the Common Crane, following a reintroduction project, and the colonisation by Great White Egret and Cattle Egret of the Somerset Levels, are significant recent conservation success stories.

The Great Crane Project released a total of 94 Common Cranes onto the Somerset Levels and Moors between 2010-2014. The first pair bred in 2013 and by 2023 the population had increased to 30 territorial pairs, with 26 attempting to breed. There were 29-32 hatched chicks in 2023 and 13 went on to fledge successfully, bringing the total fledged young since 2013 to 75 (Bridge 2024).

The Great White Egret *Ardea alba* colonised the Somerset Levels in 2012 when a pair bred at Shapwick Heath. Since then, the population has risen quickly and in 2023 73 pairs bred at the Avalon Marshes, with 88 chicks fledging from 53 successful nests (Morgan 2023). Cattle Egrets *Bubulcus ibis* have also become more numerous since first breeding in 2008. Although no breeding was actually confirmed in 2023, roost counts of 600 at Shapwick Heath and 660 at Westhay were made during September (Morgan 2023).

Whilst it is possible that White-tailed Eagles could predate these species, it is highly unlikely that this would lead to population level impacts. The Common Crane is abundant in Lithuania with an estimated 5,000-10,500 breeding pairs (Birdlife International 2015) and yet in an extensive study of the diet of White-tailed Eagles in the country, only seven individual Common Cranes were identified as prey Dementavičius et al (2020). Similarly, both Cattle Egret and Great Egret are common and widespread in areas with breeding White-tailed Eagles. The highest densities of breeding White-tailed Eagles occur in north-west Croatia in the floodplains of the Danube and Drava rivers (Mikuska et al. 2024). Here there have been no negative impacts reported on the populations of various heron and egret species, which breed and winter at wetlands such as Kopacki rit. Likewise, Marinov (2019) reported >2,000 pairs of Little Egrets, c.175 pairs of Great White Egret, and c.15 pairs of Cattle Egret in the Danube delta in Romania. Despite these large numbers, Sandor et al. (2015) found no evidence of egret predation by 20 pairs of White-tailed Eagles breeding

around the delta. Instead, Coot was the most commonly taken waterbird, with 23 other species also recorded.

This evidence from elsewhere in Europe, indicates that if White-tailed Eagles become established in the Somerset Levels area in the future, they are highly unlikely to have any detrimental impacts on either Common Crane or the egret species.

3.6. Breeding waders

During the public consultation some concerns were expressed about the potential impacts of White-tailed Eagles on breeding waders.

Waders are occasionally taken by White-tailed Eagles, but evidence from other European populations indicates that they always favour waterfowl (Ekblad et al. 2016; van Rijn and Dekker 2016). This is exemplified by data from the Netherlands where a total of 491 individual birds of 25 bird species were identified as prey in active White-tailed Eagle nests. The only waders recorded were a single Lapwing and a single Redshank, with White-tailed Eagles showing a clear preference for wildfowl, with Greylag Goose and Coot the most frequently predated species (van Rijn and Dekker 2016).

Similarly, waders were found to represent just 1% of White-tailed Eagle diet in Lithuania (Dementavičius et al. 2020). A total of 24 waders of seven species (Ruff *Philomachus pugnax* 3, Lapwing 11, Snipe *Gallinago gallinago* 2, Woodcock *Scolopax rusticola* 2, Curlew 1, Wood Sandpiper *Tringa glareola* 1, Sandpiper sp. 3, Black-tailed Godwit 1) were identified as prey remains in a comprehensive study which analysed a total of 2,272 prey items recovered from active nests (Dementavičius et al 2020). Likewise at the Danube Delta, *Charadriiformes* (waders, gulls and auks) constituted just 0.38% of White-tailed Eagle diet (i.e. total of all taxa) with Coot (9.6%) and Mallard (3.5%) the most frequently predated bird species.

Data collected as part of the ongoing Isle of Wight reintroduction corroborates the findings from elsewhere in Europe. Waders constitute just 0.8% of White-tailed Eagle

prey in southern England in a dataset of 738 records, with species taken limited to Curlew (3), Lapwing (2) and Redshank (1).

This evidence suggests that although some waders may occasionally be opportunistically taken, particularly if they are sick or injured, it is highly unlikely that the reintroduction of White-tailed Eagles will have a detrimental impact at a population level on any species, and particularly those of conservation concern.

Another potential impact of White-tailed Eagles is disturbance leading to predation by opportunistic species, such as corvids, when nests are temporality vacated. Whilst this cannot be ruled out completely, the White-tailed Eagle's preference to use the sit and wait strategy for hunting (Nadjafzadeh et al. 2016), and the limited amount of diurnal time that is spent in flight, reduces this risk considerably and almost certainly excludes any detrimental impacts at a population level.

Early evidence from the Isle of Wight indicates that White-tailed Eagles may actually benefit breeding waders, by displacing, or even predating, mesopredators which are more of a threat to chicks. Breeding success of Lapwings at [redacted] has been higher since a pair of White-tailed Eagles became established at the site, potentially because they have displaced Common Buzzards which may have been predating chicks [redacted]

Common Buzzard nestlings are predated by White-tailed Eagles in other parts of their European range, including Germany (Neumann and Schwarz 2017) and Lithuania (Kamarauskaitė et al. 2020), particularly in areas with high Buzzard abundance. Buzzards were found as prey items in 16.4% of White-tailed Eagle nests situated in areas with the highest Buzzard abundance (82 pairs per 100 km²) in Lithuania (Kamarauskaitė et al. 2020). Given the abundance of Common Buzzard in South West England it seems possible that as a breeding population of White-tailed Eagles in the region, some Buzzard nestlings might be predated.

The ongoing study into the diet of White-tailed Eagles in southern England shows that White-tailed Eagles will also predate corvids, which are another potential predator of breeding waders.

3.7. Brown Hares

Some concerns were raised during the public consultation about predation of Brown Hares. Whilst White-tailed Eagles do predate Brown Hares, ongoing monitoring as part of the Isle of Wight project indicates that, as individual eagles mature, the proportion of mammals in their diet declines, while fish increases (Figure 6). This corroborates research from around lowland Europe that in areas with alternative prey availability mammals tend not to be targeted (Mlíkovský 2009; Sandor et al 2015; van Rijn and Dekker 2016). As such it is highly unlikely that a small population of White-tailed Eagles would have a negative impact on overall Brown Hare numbers. Nevertheless, careful monitoring of White-tailed Eagle diet will be a key element of the project at all stages.

3.8. Conclusion

An essential element of any reintroduction or, in this case, population reinforcement, is to give careful conservation to the potential ecological impacts of the project. The White-tailed Eagle is a native species that was once widespread across South West England, including on the Exmoor coast. It is also very important to consider that individuals from the Isle of Wight have regularly visited the area since 2021, meaning the species is already part of the landscape once again. Nevertheless, establishing a breeding population is clearly a step change compared to visits by nomadic sub-adult birds.

The evidence considered here, coupled with detailed monitoring of the Isle of Wight birds since release indicates that the reintroduction poses no significant ecological threat, and may in some cases, actually provide local benefits through predation of feral geese and, potentially, predation and displacement of mesopredators. The overwhelming evidence from the Isle of Wight, and various European studies is that the White-tailed Eagle favours the most seasonally-abundant prey, and as such, it is highly unlikely to have an impact on threatened or rare species. In addition, the White-tailed Eagle's preference to utilise the 'sit-and-wait' method for hunting prey, which results in the vast majority of diurnal time spent perched, coupled with the fact that local breeding and wintering species become habituated to their presence, is likely to

minimise any impacts associated with disturbance during the breeding season, and also in winter when significant assemblages of birds are found in some parts of the region. Nevertheless, a comprehensive programme of monitoring will be undertaken during the course of the project. This will be a continuation of the existing monitoring and evaluation plan that is being followed as part of the Isle of Wight project.

4. The socioeconomic feasibility of a White-tailed Eagle reinforcement on Exmoor

4.1. Potential socio-economic benefits

The White-tailed Eagle is an iconic species that is widely admired by birdwatchers and the general public alike. It is regarded as an important flagship species for wetland conservation across Europe (Sandor et al. 2015), acknowledging the notion that the conservation of charismatic top predators brings wider biodiversity conservation benefits (Sergio et al. 2006). Thus, the restoration of White-tailed Eagles to Exmoor and the South West has the potential to raise the profile of the conservation and protection of coastal and wetland habitats. This would have knock-on benefits to a suite of threatened or declining species which share the same habitats. In this regard the White-tailed Eagle could be deemed an umbrella species, i.e. one whose habitat and area requirements are such that protecting it will aid a range of other species at the same time (Simberloff 1998).

In Scotland, White-tailed Eagles are known to be a major tourist attraction. For example, eagle-related visits generate up to £5 million tourist spend each year on the Isle of Mull alone, while supporting 110 local jobs (Table 5) (Molloy 2011). In a study carried out by the RSPB in 2011, 23% of visitors to the Isle of Mull were influenced to go there by the presence of White-tailed Eagles. Tourists travel from all over the UK to visit, with an average distance of 250 miles, but with some travelling more than 600 miles (Molloy 2011). Overall wildlife tourism is worth £276 million of spend per year in the Scottish economy and supports 2,763 FTE jobs (Molloy 2011). As such conservation of the local environment and the reintroduction of charismatic species can play a vital role in reinvigorating rural economies.

The response to the reintroduction of White-tailed Eagles has been extremely positive, and support for the project has grown since it began. To quantify this Forest Research replicated the public perception survey that supported the initial licence application. The report demonstrated that the public were even more in favour of the project than in 2019, with 93% of respondents saying they were supportive of the project, up from 86% in 2019 (Dunn 2022). It is not just birdwatchers who have enjoyed seeing the

eagles; the project team receives many reports from members of the public, even including excited hand gliders who have circled in thermal updrafts with White-tailed Eagles in at least two different locations.

It is now possible to see White-tailed Eagles in several locations in southern England, and the project team have been pleased that two organisations now run regular boat trips to see eagles. Birds of Poole Harbour run at least weekly trips throughout the year, and are often rewarded with excellent views of G463 and G466 which have taken up residence, as well as other White-tailed Eagles which frequently visit. These trips have proved highly popular with the public. In addition, Wild New Forest, also run trips along the Beaulieu River, where White-tailed Eagles are often encountered. Members of the public also frequently observe eagles at RSPB Arne and RSPB Pulborough Brooks, which are both sites with excellent visitor facilities. At present, it is not possible to direct visitors to view eagles at specific localities on the Isle of Wight (though local birdwatchers know the best localities), but an MSc thesis undertaken by a student from Kent University found that as many as 10% of visitors list White-tailed Eagles as a reason to visit; not insignificant considering two million people visited the Isle of Wight as tourists in 2022. These positive early signs suggest that White-tailed Eagles are likely to contribute positively to the cultural identity and economy of the region in the years ahead.

Tourism is already a key part of the Exmoor economy, and the presence of White-tailed Eagles would undoubtedly help to attract additional visitors to the area. If managed well this has the potential to provide a number of benefits to the local economy. With this in mind, a Visitor Management Strategy will be devised and shared with Natural England prior to any birds being released. The establishment of suitable White-tailed Eagle public viewpoints will, in time, be key in directing visitors to areas capable of accepting the additional footfall, and protecting private or sensitive sites from disturbance. Furthermore, the location of the translocated birds will not be publicised unless they are on nature reserves where the managing organisation has agreed to publicise them, or similar sites, with appropriate viewing/visiting facilities. This approach has been undertaken successfully with the ongoing Isle of Wight project.

Table 6 (from Molloy 2011). Spending by tourists visiting the Isle of Mull to see White-tailed Eagles.

How important were White-tailed Eagles in visitors' decisions to visit Mull	Total % of visitor responses	% of spending attributed to White-tailed Eagles from these responses		Total expenditure attributed to White-tailed Eagles (£)	
		Low	High	Low	High
One of the reasons	21.08	20	35	428,545	571,393
Main reason	1.23	60	90	2,448,165	4,284,289
Total	**22.31**			**2,876,710**	**4,855,683**

A longer-term aspiration of the project is to establish a viewing site at an active nest, as has been implemented successfully in various locations, including the Isle of Mull. This would enable visitors to enjoy watching breeding eagles in a carefully controlled location. This approach has also been used with Ospreys at Rutland Water where a publicly viewable nest diverts attention away from other nests on private farmland. This nest is viewed by up to 30,000 people each year (Mackrill et al. 2013).

There are other benefits of restoring lost species like White-tailed Eagles, that are far harder to quantify than, for example, an increase in visitor numbers and tourism spending. Early evidence from the Isle of Wight project is that the reintroduction of White-tailed Eagles to southern England is changing perspectives about how a species like this can coexist with humans in a densely populated anthropogenic landscape. The chance of encountering a species like the White-tailed Eagle in southern England is one that is relished by many people. The benefits of nature to mental health and wellbeing are now well known (Keniger et al 2013) and it is clear that the reintroduction of White-tailed Eagles to the Isle of Wight and southern England

has enhanced the landscape, not only in the sense of restoring a lost native species, but in reinstating one that can create a sense of awe and wonder like few others.

4.2. Socioeconomic risks

4.2.1. Sheep farming

4.2.1.1. Sheep farming in Scotland

Although White-tailed Eagles take a diverse array of prey, there has been long standing debate in Scotland on the extent to which they predate lambs. Studies undertaken in western Scotland have demonstrated that lamb remains are found in White-tailed Eagle nests (see section 2.2), but concluded that the majority had been scavenged rather than taken live (Marquiss et al. 2004). Furthermore, there was circumstantial evidence that many of the lambs killed were not viable because, compared with live lambs, they were small for their age and similar to lambs lying dead on the hill from other causes (Marquiss et al. 2004).

Some crofters have claimed that levels of predation have increased in recent years. In view of this further research was undertaken by Scottish Natural Heritage in the Gairloch area in 2009, following alleged large losses in 2008 (Simms et al 2010). In this study a total of 58 radio tags, each fitted with a mortality chip that was triggered after two hours inactivity, were attached to lambs from three flocks on two crofts to enable any dead lambs to be located within a short time of death. Within the radio tracked study flocks, no lambs (including both tagged and untagged individuals) were taken by White-tailed Eagles during the study period. Furthermore, of six lambs found dead in the wider study area and sent for post-mortem only one (with poor body condition) had injuries indicating that it was likely killed by either a White-tailed Eagle or Golden Eagle (Simms et al. 2010). There was no evidence to substantiate eagle predation for any other lamb carcasses or remains, although four of the examined carcasses did show signs of avian scavenger activity (White-tailed Eagles were recorded scavenging on two of these carcasses). In addition, a total of 224 vantage point surveys were undertaken during the study, amounting to 599.1 hours of observation. During this period, White-tailed Eagle activity was recorded for less than 2% of total observation time and no White-tailed Eagle predation was observed.

In recent years farmers and crofters in Scotland, have continued to raise concerns and in 2015 this led to the launch of the Sea Eagle Management Scheme (SEMS), a joint initiative instigated by NatureScot (formerly SNH) and NFU Scotland (https://www.nature.scot/professional-advice/land-and-sea-management/managing-wildlife/sea-eagle-management-scheme). This extended support for livestock farmers and crofters who report impacts across the White-tailed Eagle breeding range. Farmers are asked to record details of flock management and lamb losses using a log template, and to include any evidence of livestock predation. Local stakeholder groups have been set up in several key areas and scheme advisors visit farms in order to:

- investigate what White-tailed Eagle activity is occurring near to the farm
- help to gather evidence of White-tailed Eagle impacts and record any livestock losses due to White-tailed Eagles or other causes
- advise on measures to mitigate against White-tailed Eagle impacts
- arrange to lend equipment, where appropriate, to use to deter White-tailed Eagles or otherwise mitigate impacts
- recommend support for longer term management agreed with, and carried out by, the livestock manager.

In addition, a new collaborative measure, enhanced shepherding, is currently being trialled and supported under the scheme. NatureScot report that 'this measure was developed following on from monitor farm trials and initial shepherding work carried out at a Skye sheep stock club in 2019, which recorded sea eagle activity on the hill and possible signs of predation'.

The enhanced shepherding scheme has two main aims, as outlined by NatureScot:

1. To allow more detailed information to be recorded and reported back to Call off Contractors and NatureScot from the shepherded areas. This information will help inform future management on the holding to try and address issues with Sea Eagles and hopefully allow a better understanding and identification of specific areas which are experiencing more issues than others.

2. Provide a scaring element through the presence of shepherds on areas of the hill. It is hoped the presence of shepherds on the hill will act as a visible

deterrent to Sea Eagle interaction with livestock in parts of the holding where this measure is carried out.

Although initial feedback has been mixed, there is evidence that the presence of additional shepherds has reduced losses in some areas, as detailed in a 2021 summary report, published by NatureScot: https://www.nature.scot/doc/sea-eagle-management-scheme-summary-report-enhanced-shepherding-2021.

Despite the reported problems, there remain very few observations of direct predation of lambs by White-tailed Eagles, and it is clear that a range of other species including Golden Eagles, foxes and corvids have an impact, as referenced in the above report. A recent study by Reid et al. (2023) based on 11,374 prey remains, collected over 20 years from 92 nesting territories in Scotland showed that marine items (seabirds and fish) were the most important prey items during the breeding season. Overall lamb accounted for just 6% of prey remains and the majority of nests sampled contained no lambs or only occasional lambs. Half of all territories had values between zero and six percent of items, while only seven territories had lambs as 30% or more of items: two in Lochaber and five on Mull. It is significant that all of the sites with higher percentages were occupied relatively early in the colonisation process: 1982, 1983, 1997, 2000 and 2001. The authors suggest that one potential explanation for this 'might be that during the initial settlement phase of recolonisation, following release some inexperienced young eagles were sustained by feeding on carrion. This tendency may well have predisposed some released immatures to settle in places where carrion was most available, which in some regions was where there were most dead or moribund sheep and lambs. Subsequent, later generations of wild bred recruits settled in areas where live prey (seabirds and increasing numbers of breeding geese) was more abundant and carrion became less important.' Reid et al. (2023) conclude that 'the previously widespread view that lambs are an important food for White-tailed Eagles has been superseded; the prevailing evidence now is that marine items (seabirds and fishes) are the most important breeding season food in Scotland'.

4.2.1.2. Sheep farming in Ireland, Netherlands and the Isle of Wight

With the ongoing controversy and conflict in Scotland, the Irish White-tailed Eagle reintroduction was met with considerable opposition by the farming community when it was first proposed. In view of this, significant efforts were made by the Irish team to

address these fears by meeting with farming groups and working with farmers locally where eagles took up residence. The first pair of translocated eagles bred successfully in 2013 and by 2024 a total of 62 chicks had fledged from wild nests (Mee et al. 2024). In addition, a second phase of releases of young birds of Norwegian origin, began in 2020 at sites in SW Ireland to bolster the existing Irish population.

There has been no conflict with sheep farming since the project began, and in 2019 Dr Allan Mee, who led the first phase of the reintroduction, reported for the Isle of Wight feasibility report (Dennis et al. 2019) that, "*White-tailed Eagles are now seen as very much part of the landscape. In fact, in that time, we have had no proven case of an eagle taking a lamb, even where pairs are breeding in hill sheep areas. As has been seen in Norway, the eagles are well known to scavenge carrion including sheep and lamb carcasses. It has taken several years but I believe we can categorically state that there has not been the damage to farming interests that were feared initially and most sheep farmers are now either neutral or positive towards the eagles. Indeed, we are delighted that two sheep farmers are helping us to monitor eagle nests by watching nests in their area*".

The changing attitudes of farmers in Ireland has also been covered in the Irish media. Two articles by Majella O'Sullivan in the Farming Independent in December 2017 were significant: "*From protests to partnerships: How farmers are supporting the reintroduction of the White-tailed Eagle*" (Figure 17) and "*They never touched a lamb: Lough Derg farmer on the reintroduction of the White-tailed Eagle"*. The latter focused on the experience of one farmer on the Tipperary shore of Lough Derg, Joss Hogan, who has worked closely with the project team since the birds settled in the area in 2011/12. He has kept records of the birds and has had a positive influence on the wider farming community.



Figure 17. Article in Farming Independent in Ireland.

Significant concerns were raised by sheep farmers when the Isle of Wight was first proposed. As a result, Roy Dennis and Tim Mackrill organised a visit to the Netherlands to learn how White-tailed Eagles lived in a highly anthropogenic landscape much more akin to southern England than western Scotland. They found that like in Ireland, there have been no cases of lamb predation in the Netherlands, where there are now 40 pairs of White-tailed Eagles on territory, nor any other conflicts with livestock or poultry farming of any kind. Sheep are frequently kept on the dykes to maintain short vegetation but there is no evidence of any lambs being taken even in areas where White-tailed Eagles are provisioning young (van Rijn and Dekker 2016). This reflects the situation across continental Europe, where no conflict with livestock farming is reported.

The Isle of Wight project's Steering Group includes members of the National Farmers' Union (NFU), National Sheep Association (NSA) and Hampshire Sheep Group to

ensure that sheep farmers have a stake in the project. The project has also made a concerted effort to reach out to sheep farmers through visits to individual farms, and talks to larger groups. This has been met with a positive response.

As reported in Section 2 the diet of the Isle of Wight birds has been studied extensively since 2019, and there have been no evidence of predation of sheep or other livestock. Satellite tracking data enables the movements of all released birds to be monitored in detail and this provides reassurance to farmers. The project also has a clear reporting procedure to enable farmers to get in touch with the project team should any concerns arise. In the few cases where this has been the case, the Project Officer has responded immediately and, in every case, the subsequent visit has found no evidence of predation, and the farmer has been reassured. Each of these visits has been documented and a report sent to Natural England.

4.2.1.3. Sheep farming on Exmoor

Extensive livestock grazing is the primary farm type on Exmoor with cattle and sheep as the main livestock kept. A Defra survey in 2021 found there were 375 farm holdings with grazing livestock, of which 331 were upland farms and 44 lowland farms. There were a total of 213,725 sheep across these farms, of which 101,917 were breeding ewes and 108,592 lambs under a year of age. This represented an 18.9% decline in overall sheep numbers since 2013. For upland grazing farms, around 62% of average farm income was from the Basic Payment Scheme (double what it is for all farm types), 28% from agri-environment schemes (compared to 8% for all farm types) and 9% from diversification (19% for all farm types) (ENPA 2023).

It is important to recognise that White-tailed Eagles have been regular visitors to Exmoor since 2021 and, in that time, there has been no conflict with sheep farming. One of the two longest staying birds, G405, which now breeds in West Sussex, was present on Exmoor from 17th May – 26th June 2021, and then again from 8th August – 3rd November 2021 (Figure 18). During this period G405 frequented upland areas and on her initial visit small lambs were present. During this period the project team had regular contact with a sheep farmer who was delighted to see the eagle on his upland farm, and regularly reported sightings of G405 and at least one other eagle, which was

thought to be a wandering bird from Scotland or continental Europe. Satellite data showed that G405 favoured areas with large numbers of rabbits, and was also observed feeding on a deer carcass.

G819, a female released on the Isle of Wight in 2021 has been a regular visitor to Exmoor, making four visits from 12th August 2022 – 10th March 2023, 20th April – 1st May 2023, 19th August 2023 – 6th February 2024 and 4th – 30th January 2025. G819 has generally favoured game shooting areas to the south of Exmoor, where there is an abundance of carrion, but it was notable that during her most recent visit, in January 2025, she spent significantly more time along the coast at Porlock than in previous visits, which reflects the changing habits of White-tailed Eagles as they mature and favour fish and other marine prey. These movements are shown in Figure 18. Like G405 she has been present on Exmoor during periods when small lambs are present, but there has been no conflict.



Figure 18. Movements of G405 (white) and G819 (yellow) in the Exmoor area.

Given these experiences, the behaviour of Isle of Wight birds in other parts of the country, and of White-tailed Eagles in Ireland, Netherlands and across their European range, we are confident that there will be little or no conflict with sheep farming in Exmoor and across South West England.

In Scotland hill sheep often lamb on open exposed slopes, away from farm buildings where they may be more exposed to bad weather, including late snows, and to predation. Even those that lamb close to the farm and are put out to the hill with their mothers may subsequently suffer from late snows and bad weather. Whilst this is also true of some sheep farming on Exmoor, the abundance of alternative natural food, as described in Section 2, coupled with more favourable weather, make conflict highly unlikely. It is notable that in the NatureScot report referenced above, areas of conflict appear to be occurring in locations where natural prey availability appeared to have declined.

Sheep farming representatives will be invited to join the project steering group, and a formal reporting procedure has been devised, based on work undertaken on the Isle of Wight. This means there will be a clear means by which any reported problems can be investigated, and mitigation measures put in place should they be deemed necessary. The reporting procedure is included in Appendix 2.

4.2.2. Poultry Farming

The amount of poultry farming has increased in the Exmoor area in recent years, but remains at a low level. The most recent figures show that the total number of birds kept had increased from 13,423 in 2010 to 99,186 in 2021 (ENPA 2023). Nevertheless, this is considerably lower than in other parts of the country, such as East Anglia, where satellite-tagged eagles from the Isle of Wight have been frequent visitors, with no issues.

Monitoring across their European range suggests White-tailed Eagles pose little or no threat to free-range poultry. Evidence from countries such as Poland and Germany with large and widespread populations of White-tailed Eagles demonstrates there is no conflict with the industry, and extensive diet studies have not identified domestic poultry as prey in those countries, or elsewhere in Europe where welfare criteria for free-range poultry are the same as the UK (e.g. Anderwald et al 2013; Nadjafzadeh et al 2015). This is in contrast to other raptors, most notably Goshawk, which is known to predate domestic poultry in Poland (Gryz and Gryz 2019) and occasionally in the Netherlands (Bestman and Bikker-Ouwejan, 2020). This difference is likely due to the

broader diet of the White-tailed Eagle and its preference to breed close to water where fish is usually the favoured prey during summer months when breeding pairs are rearing chicks and demand for food is highest (Anderwald et al 2013, Nadjafzadeh et al 2015).

4.2.3. Game shooting

Like in much of southern England, game shooting is widespread in the Exmoor region, from small scale rough shoots, to larger commercial pheasant and partridge shoots. In view of this it is important to consider any potential impacts. Satellite tracking and field monitoring of the Isle of Wight birds since release has shown that young birds often linger in game shooting areas, particularly during their early years when carrion is an important element of the diet. This is also the case in the Czech Republic (Belka and Horal 2009).

As described above, G819, a female White-tailed Eagle released on the Isle of Wight in 2021, has made four separate visits to the Exmoor area, and lingered in game shooting areas during her first three visits in particular. [redacted]. The presence of the eagle had no negative impacts on the shoot, and the gamekeeper was very supportive. This situation has been replicated in other areas of the country where young eagles have lingered. Their habit of remaining perched for >85% of diurnal time means that they are often very inconspicuous in the landscape and rarely flush gamebirds. Any live gamebirds that are predated tend to be individuals that are injured or sick, and the vast majority are consumed as carrion. Furthermore, individual eagles have low food requirements, meaning they are highly unlikely to have any impact on overall numbers of either pheasants or partridges in any one location.

The proportion of gamebirds in the diet declines with White-tailed Eagle age because there is a marked switch to fish as they mature (Figure 6). There is no evidence that gamebirds constitute a key part of the diet of White-tailed Eagles during the breeding season in any part of their range. In western Scotland gamebirds were found to constitute just 0.4% of White-tailed Eagle diet (compared to 7.6% for Golden Eagles) (Whitfield et al. 2013). Meanwhile in more natural habitats for pheasants, in and near

reed beds in the Danube Delta, Pheasants made up less than 5% of the diet of breeding White-tailed Eagles, and this was most likely to include birds killed on roads and taken as carrion. Overall, Pheasants constituted just 0.42% of the total biomass consumed by White-tailed Eagles (Sándor et al. 2015).

Pheasant and partridge shooting is widespread across the Exmoor region, and it is likely that some juvenile birds will favour areas with shoots during their first winter, as observed with birds released on the Isle of Wight. It will therefore be important to liaise closely with land managers with sporting interests where White-tailed Eagles settle. This approach has been used successfully on the Isle of Wight, and the project has received helpful support from gamekeepers as well as the Game and Wildlife Conservation Trust (GWCT). There is no evidence that the presence of White-tailed Eagles has had a detrimental impact on any game shoots on the Isle of Wight or elsewhere, and Mike Short, predator ecologist at GWCT and a member of the project's steering group, wrote a blog in December 2020, describing the positive relationship that has developed between the project and game shoots on the Isle of Wight. One of the key elements of this is that when White-tailed Eagles are present on shooting estates, the location of the birds is not made public to avoid disturbance to the birds themselves and game shooting activities. This approach has been welcomed by shoots, and will be replicated in South West England should the project receive a licence. Furthermore, should any issues be reported to the project, they will be investigated with the utmost urgency.

As a breeding population develops there is the possibility that White-tailed Eagles may settle to breed in woodlands with game shoots. While shooting activities do not take place during the breeding season, it may be that nests are built near pheasant pens. If this was the case the project team would work closely with gamekeepers and other land managers to determine the best course of action in order to prevent disturbance to breeding birds, while minimising any disruption to present land use and activities. The project team will also undertake a programme of artificial nest building to encourage young White-tailed Eagles to set-up territories in the most suitable areas.

As with the Isle of Wight project, representatives of the game shooting industry will be invited onto the project's steering group.

4.2.4. Fishing interests

Evidence from the Isle of Wight, and other White-tailed Eagle populations across Europe indicates that fish is likely to constitute a key part of diet throughout the year, and, as such, it is essential to consider potential impacts on any fishing interests.

White-tailed Eagles readily take both marine and freshwater fish, targeting individuals that are close to the surface and relatively slow moving. It is for this reason that species such as Grey Mullet, which can be seasonally abundant in shallow water in estuaries, as observed on the Isle of Wight, at Poole Harbour and other parts of the South Coast, are favoured prey.

Like on the South Coast, it is likely that Grey Mullet will be a key prey item of White-tailed Eagles along the Exmoor coast and wider region. Although mullet are edible they are not popular as a food fish in Britain and as a result commercial vessels do not generally target mullet in UK waters.

There is potential for some marine fishermen to benefit from the proposed reintroduction. In Scotland fishing boats take wildlife enthusiasts and photographers out to view White-tailed Eagles that have learnt to take fish thrown from boats (e.g. http://www.mullcharters.com/sea-eagles-mull.html). There is already evidence of birds released on the Isle of Wight behaving similarly, and so if the Exmoor project is granted a licence, the same may be possible in future years. The project will make every effort to support any such ventures.

White-tailed Eagles also take freshwater species, and often breed around freshwater wetlands in continental Europe. In the Netherlands, for example where fish constitutes 28% of the diet, Carp and Bream are most commonly caught (83%) with a range of other species also taken, including Pike, Zander and Perch (van Rijn and Dekker 2016). Likewise in West Sussex, where translocated eagles G405 and G471 bred successfully in 2023 and 2024, freshwater fish such as Common Carp, Roach, Pike and Bream were a key part of the breeding season diet, particularly during April and May.

We expect the initial breeding pairs that settle in the Exmoor area to be coastal, but it is possible that they will also breed close to freshwater wetlands. Two large reservoirs in the South-East of Exmoor, Wimbleball Lake and Clatworthy Reservoir, are stocked with trout for angling, and also contain an array of other freshwater fish, including Roach, Bream and Pike. Even if White-tailed Eagles do settle in this area, it is highly unlikely they will have any detrimental impact on stocked trout or any other species given the relatively small number of breeding pairs that are likely to become established in the short to medium term, and the varied diet of the species. There has been no conflict with any element of the fishing industry since the Isle of Wight project began.

During the public consultation the owner of a trout farm contacted the project to express concerns over potential predation by White-tailed Eagles. The project team reassured the owner that there has been no conflict with trout farms in other parts of southern England since the Isle of Wight project began. As an example, various eagles regularly visit the Avon valley in Hampshire/Wiltshire, where a number of trout farms and other fisheries are located. Here the eagles favour the various freshwater wetlands along the valley, and there have been no issues at the trout farms. In fact, one trout farm owner in the Avon valley is an enthusiastic supporter of the project.

It is also important to recognise that White-tailed Eagles are also predators of other piscivorous birds, such as Cormorants. White-tailed Eagles are known to predate juvenile Cormorants in various parts of their European range, including the Netherlands (Ekblad et al 2016, D van Straalen pers. comm. 2020) and it is possible that, in time, this may also be the case in South West England. Cormorant is a species far more likely to result in conflict with anglers, but in the absence of White-tailed Eagles it has no natural avian predators in the region. It is significant that there has been no conflict with freshwater fishing interests anywhere in Scotland.

Although we do not expect any conflict with fisheries, it will be important to continue to liaise closely with all fishing interests if the project is given permission to proceed. Representatives from the marine and freshwater angling community will be invited onto the project steering group to ensure that their views are considered at all times. This offer was extended to both the Marine Management Organisation and Angling

Trust at the time of the Isle of Wight project, but they did not consider it necessary. Instead, they are both corresponding organisations, who receive minutes from steering group meetings.

It should also be noted that the project team has extensive experience of dealing with fishing stakeholders given our ongoing work with Ospreys in both Scotland and England. In Rutland, Tim Mackrill worked with the owners of a trout farm who were losing significant numbers of fish to Ospreys, Cormorants, Grey Herons and Otters. Following extensive discussions, the owner, with the help of the Rutland Osprey Project, built a photography hide on site and now charges photographers £87 per session to view the fishing Ospreys. With the hide able to accommodate up to six people concurrently, this has become a profitable venture and a key component of the business, off-setting all losses to predation and other factors, and reducing the number of fish that the trout farm needs to sell. This kind of partnership led approach will be essential to the long-term success of the White-tailed Eagle project.

4.2.5. Forestry and Woodland Management

The forests and woodlands of South West England make an important contribution to the rural economy. The economic benefits provided by forestry and woodland management and the wider use of wooded habitats are diverse ranging from commercial timber harvesting to leisure-based pursuits and social enterprise. The very presence of woodland in the landscape creates a desirable environment with corresponding impacts on property values. Many woodlands are also integral to the game shooting industry, as previously discussed.

The project team are confident that the return of the White-tailed Eagle to the region will have a negligible to insignificant negative effect on the forestry and woodland management sector. This relates to the relatively large size of White-tailed Eagle territories and its proven ability to cope with disturbance associated with mechanised forest management and recreational use as observed elsewhere across its current range. However, the return of this protected species to forests and woodlands where landowners and managers have no experience of managing in their presence will necessitate the development of guidance material to help inform forest management practice.

In the interim the project field team will provide advice and support to the forestry sector and other woodland stakeholders, alongside that which is extended to the farming community and other key stakeholders. This will be particularly important as breeding White-tailed Eagles begin to become established in the landscape. Nests are likely to be built in woodlands with tall mature trees and the project team will work closely with all key stakeholders to ensure that any landowners with nest sites receive the necessary support to ensure that the birds are not disturbed at key points in the breeding season, and that present land-use is disrupted as little as possible and that timber harvesting can continue, while recognising the White-tailed Eagle's status as a Schedule 1 species under the Wildlife and Countryside Act 1981.

4.2.6. Reporting Procedure

In view of concerns raised during the public consultation, and in keeping with the approach taken on the Isle of Wight, a reporting procedure for farming, fishing and shooting interests has been devised. This provides clarity on the way that any reports of problems will be dealt with by the project team in conjunction with Natural England and the project's steering group, and the mechanisms by which subsequent action would be taken. Measuring the effectiveness of any mitigation implemented will be a key element of the project's monitoring and evaluation plan, as per the Isle of Wight project. This reporting procedure is included in Appendix 2.

4.2.7. Conclusion

It is inevitable and understandable in a landscape where White-tailed Eagles and other apex predators have been absent for several centuries that any proposed reintroduction is met by concerns within the livestock, poultry, shooting and fishing sectors. Nevertheless, it is important to consider that the project has also received significant support from members of these communities, and that any divisions are often amplified by media portrayal and by the very fact that those who oppose any such projects tend to be more vocal in their response than those who are ambivalent or supportive.

Whilst we do acknowledge the concerns raised during the public consultation, it is important to recognise that the White-tailed Eagle is a species that coexists very well

with humans across continental Europe, most notably in Germany, the Netherlands and Denmark. In these countries there is no conflict with farming, shooting or fishing interests and the birds are seen as very much part of the landscape. This evidence, coupled with experiences from the Isle of Wight project is extremely important. It shows that preconceptions about a species like the White-tailed Eagle are often based on misinformation, rather than evidence, and that the current situation in Scotland is unique. In southern parts of Britain where natural prey availability is high, and thus more akin to lowland Europe, the likelihood of conflict with any kind of livestock farming is low, as exemplified by the first five years of the Isle of Wight project. The project team is committed to working closely with all key stakeholders, as demonstrated by the Isle of Wight project. Ongoing monitoring will form a key part of the project and there is a clear reporting procedure for livestock, poultry, shooting and fishing interests should any concerns arise (Appendix 2). Representatives from all key groups will also be invited to join the project's steering group. This, we hope, will help to reassure those with concerns that they have been listened to, and give them a direct link to the project. It will also enable those organisations to share relevant information with their members and ensure that misinformation is avoided by having direct correspondence. The project has also devised an exit strategy as is recommended for all reintroduction projects through the IUCN guidelines.

We believe that in the long run the White-tailed Eagle will enrich the wetland and coastal ecosystems of South West England and that the birds will coexist with livestock, shooting and fishing interests as observed elsewhere in Europe. This would be a mark of success for the project.

5. Stakeholder and public consultation

5.1. Key local stakeholders

With a population of around 10,000 (ONS 2023) Exmoor has many stakeholders which cover a range of activities from farming to tourism, forestry to game shooting. ENPA is well-placed to identify local stakeholders and has many existing relationships with landowners, tenant farmers, businesses and local agencies.

As described earlier, ENPA staff have been working closely with RDFW and FE since 2021 to visit farms, game shoots and other land holdings in areas favoured by White-tailed Eagles from the Isle of Wight. The aim of these meetings has always been to educate people on the ecology and behaviour of the White-tailed Eagle and be a point of contact for any future conversations. Most of this work has been undertaken by Richard Eales (ENPA Ranger) and Zoe Smith (RDWF). More recently the project team have also spoken with key stakeholders close to the proposed release site, and any other farmers, landowners or game shoot managers who wish to discuss the project. Overall, the team have made at least 37 one-to-one site visits in this way, as outlined [redacted] This work has again been led by Richard Eales and Zoe Smith with additional support from other members of the ENPA project team, Heather Harley and Charlotte Wray. Although time consuming, this approach has been welcomed and has resulted in many positive relationists being formed.

In addition, the project team has also reached out to a range of different organisations from different sectors, including farming shooting, conservation and natural history, including those with local and national remits, to discuss the proposed project.

[redacted]

5.2. Public meetings

Two initial Information Events were held in November 2024 to provide information about the proposed project. These were advertised widely through social media channels, printed posters in local amenities such as Timberscombe Post Office and Porlock Spar, as well as through traditional media outlets such as BBC Spotlight and

ITV Points West the regional news programmes for the West Country, and BBC radio interviews (see media report for more information). The events were also advertised to specific groups such as farmers and conservation bodies through local contacts such as the Exmoor Hill Farming Network and the Exmoor Society. These events were held in National Park Centres run by ENPA. The first took place in Dunster on the evening of Friday 22nd November (Figure 19 and Figure 20) and a second was held at Lynmouth during the day on Saturday 23rd November (Figure 20). The event times were chosen to try and make them as accessible as possible. The Saturday event at Lynmouth was advertised as being family friendly, and craft activities were available including felt eagles, lino print bookmarks and badgemaking (Figure 21). As part of the overall consultation period a member of the ENPA team created artwork to inspire the public engagement and brand the project. These were made available at information events as posters and informative postcards with facts on the reverse.

These events were well attended by members of the public as well as individuals from the farming and game shooting community. The events took the form of an hourly talk by Zoe Smith (RDWF) followed by a Q&A with Tim Mackrill and Zoe (RDWF) as well as Steve Egerton-Read (FE) from the Isle of Wight project team and opportunity for 1:1 discussions with remaining members of the project team from ENPA over refreshments (Ali Hawkins (Senior Ecologist), Heather Harley (Farming & Land Management Officer), Caroline Cook (Senior Communications Officer), Richard Eales and Charlotte Wray (Rangers)). Tablets were available for attendees to fill out the Public Perception Survey. The events were well attended and feedback was very positive. It was pleasing that individuals with concerns appreciated the opportunity to speak directly with those involved in the Isle of Wight release and their experiences.

After the initial events, a further Information event was requested by the NFU. In order to accommodate this, the initial closing date of the Public Perception Survey was extended by a month and the meeting was subsequently held in January 2025 at Exford Memorial Hall (Figure 22). The event was disseminated widely via ENPA social media channels and with targeted invitations to groups such as the Devon Closewool Society, Exmoor Horn Sheep Breeders' Society as well as the local commoners groups such as East Anstey and Brendon Commoners. The hall was at capacity with over 120 members of the public in attendance, including the chair of the Greater Exmoor Shoot

Association (GESA), local farmers, landowners and representatives of the National Sheep Association (NSA), the NFU and the Exmoor Hill Farming Network as well as local ecologists and other environmental professionals working on Exmoor. The event was structured as a 30-minute talk given by Zoe Smith (RDWF) followed by a formal Q&A session and then additional opportunity for 1:1 discussions with the project team over refreshments. A chair was chosen to oversee the event as we were aware that some conflict may arise due to the recent proliferation of newspaper articles on the subject of lamb predation by White-tailed Eagles in Scotland. Tim Mackrill (RDWF) and Steve Egerton-Read (FE) were in attendance and participated in the formal Q & A alongside Zoe Smith. Officers of Exmoor National Park Authority in attendance were Clare Reid as Chair (Head of Climate, Nature & Communities), Ali Hawkins (Senior Ecologist), Heather Harley (Farming & Land Management Officer), Caroline Cook (Senior Communications Officer), Richard Eales and Charlotte Wray (Rangers). The event gave an opportunity for individuals with concerns to speak directly to the project team from the Isle of Wight who have a wealth of experience of the behaviour and diet of White-tailed Eagles in southern England. There was a mixture of support and opposition in the room, but all individuals with concerns were given ample opportunity to speak with the team and all stayed around after the event to continue the discussions.

Event attendances:

Friday 22 November, 6-8pm, Dunster National Park Centre: 100

Saturday 23 November ,11am-2pm, Lynmouth National Park Centre: 200

Tuesday 21 January 2025, 6-8pm, Exford Memorial Hall: 120



Figure 19. Left: Zoe Smith speaking with attendees at Dunster; Right: RDWF, FE and ENPA project team at Dunster information event





Figure 20. Left: Attendees at Dunster information event; Zoe Smith and Richards Eales at Lynmouth information event









Figure 21. Craft activities at Lynmouth information event



Figure 22. Attendees at Exford information event

5.3. Public Perception Survey

A Public Perception Survey, modelled on the Isle of Wight survey run by FE and RDWF, was undertaken over the winter of 2024/25. It was hosted on Microsoft Forms and was anonymised. The survey can be found in Appendix 3, and the full data set is supplied separately.

The survey was opened on 12 November 2024 and ran for 113 days until 31 January at 5pm. A total of 2062 responses were received. 619 of the responses were from Exmoor and 834 of the responses were from Somerset or Devon, but outside the National Park. The survey began with a short paragraph outlining the project to date, the proposal to reinforce the population from the Isle of Wight release as well as bullet points on the behaviour and ecology of the White-tailed Eagle.

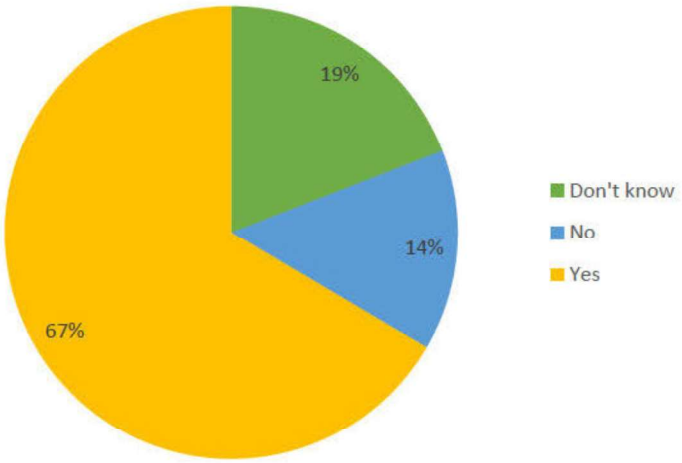


Figure 23. Response to Question 1: Did you know what a White-tailed Eagle was before completing this survey?

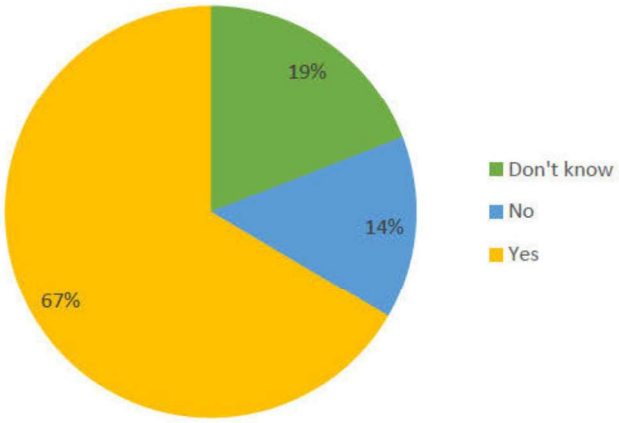


Figure 24. Response to Question 2: Do you think White-tailed Eagles are native to Exmoor? *Native means they have naturally occurred here in the past.*

Overall support for a reinforcement project on Exmoor was high with 80% of respondents answering positively to question 3 (Figure 25). This rose slightly to 85% for those living in the surrounding counties of Somerset and Devon and dropped to 66% for those living on Exmoor. Between 2% and 3% of people were neutral on the topic regardless of residency. Overall, 18% of the total respondents were against a release, 13% from the surrounding counties and 31% of respondents from Exmoor.

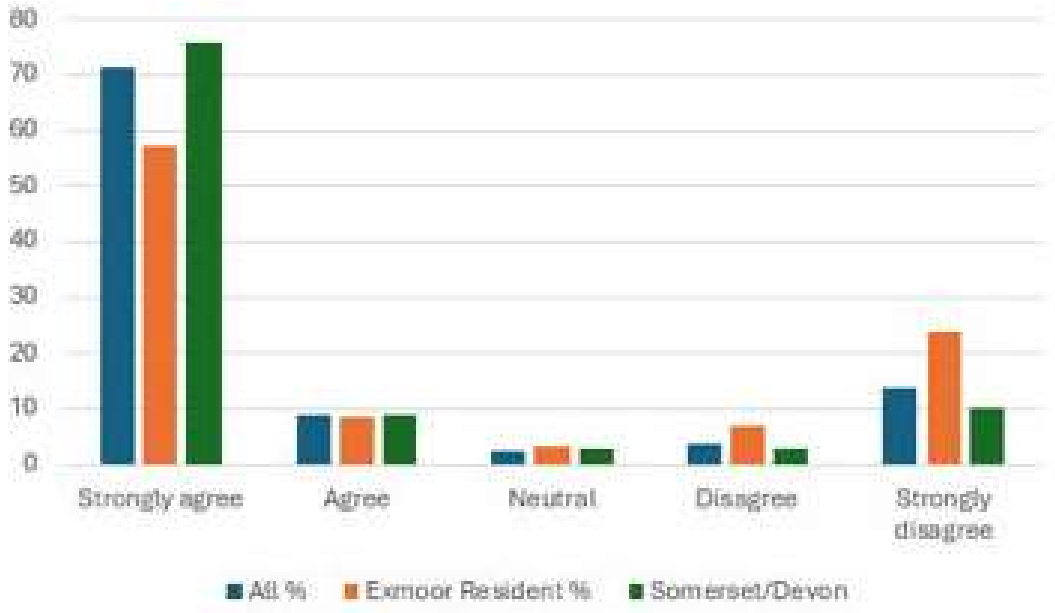


Figure 25. Responses to question 3: I would support a reinforcement of the White-tailed Eagle population in southern England through a release on Exmoor.

Question 4 and Question 12 allowed respondents to write free form any comments they wished. These comments were analysed broadly and can be summarised into broad positive and negative themes. Overall, 2,627 comments were received. The positive themes include support for biodiversity and ecosystem restoration, benefits for eco-tourism and the local economy, a moral argument for helping to restore the nature that has been lost, as well as restoring apex predators to help rebalance the complex food web. The negative themes are concern around welfare of livestock, particularly any impact the White-tailed Eagles may have on lambing on Exmoor, especially on the open moor, concern around reintroduction of a predator, scepticism over the need for reintroductions both in terms of resources needed to protect the wildlife already on Exmoor and the idea that the eagles will make their way to Exmoor in time. Some individuals support reintroduction with the caveat of careful management and long-term monitoring.

[redacted]

[redacted]

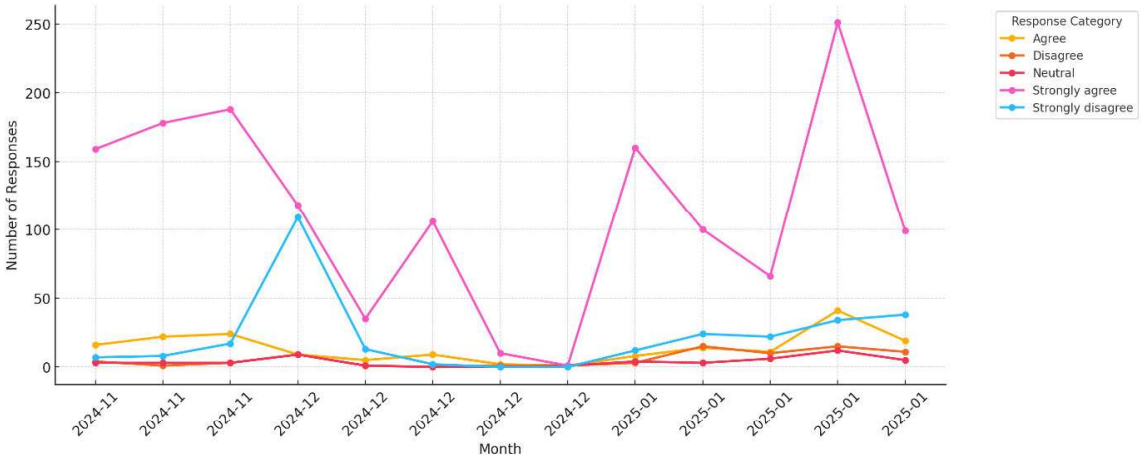


Figure 26. Weekly trends in response to question 3: I would support a reinforcement of the White-tailed Eagle population in southern England through a release on Exmoor.

Question 7 revealed that 92% of respondents visited the national park and a breakdown of recreational interests is shown in Figure 27.

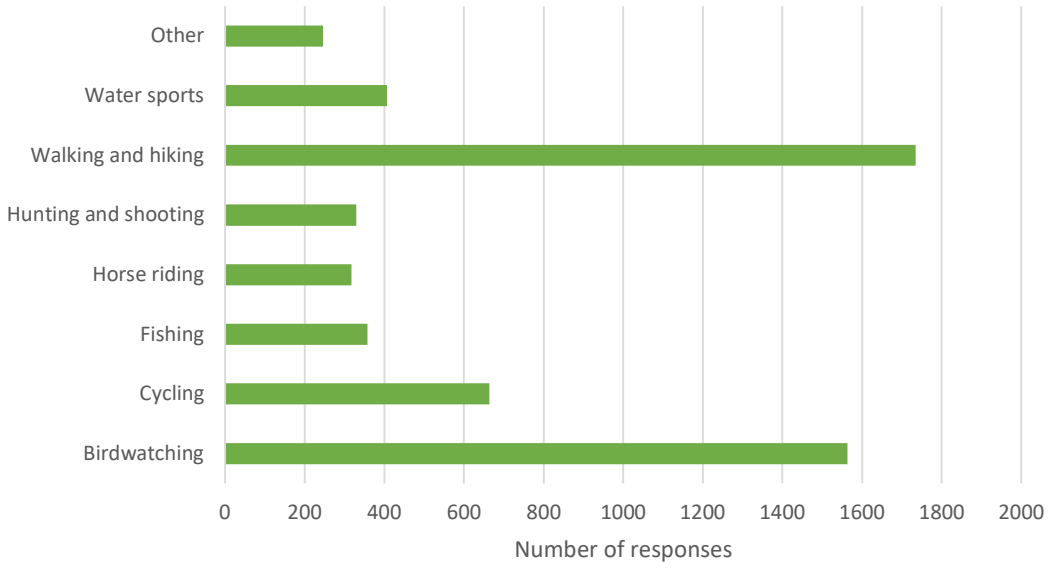


Figure 27. Responses to question 10: Are you interested in any of the following activities?

Questions 8 and 9 related to how many respondents worked on Exmoor – 37% of people answered yes to this question – the top three sectors were agriculture – including farming, livestock, horticulture and agricultural contracting; environmental including conservation, land management and ecology; and tourism and hospitality – including accommodation providers and hospitality. Other sectors included education and academia, public sector and government, forestry, health and social care, charity and volunteering (especially in conservation), retail and construction and trades.

5.4. Media Coverage

Prior to the announcement of an active project seeking to release White-tailed Eagles on Exmoor, there has been some media coverage around the individual eagles which have visited Exmoor since 2021:
Country diary: a sea eagle sits in the mist, medieval and unreal | Wildlife | The Guardian

On 12 November 2024 a press release was issued detailing the project plan to apply for a licence to release White-tailed Eagles on Exmoor as part of wider efforts to

reinforce the population across southern England. The press release also gave details of the public perception survey which was opened the same day. TV interviews with Zoe Smith (RDWF) and Richard Eales (ENPA) on BBC Spotlight, BBC Points West and ITV West Country as well as radio interviews with BBC Radio Devon and BBC Radio Somerset were broadcast the following week leading to the first peaks in survey numbers. Further online articles followed specifically about the Exmoor project survey and events included:

Are white-tailed eagles returning to Exmoor national park? | Great British Life

Chance to find out about rare white-tailed eagle at Exmoor event | wsfp.co.uk

Time Out

Devon Live

BBC

Bird Guides

ITV

Somerset Live

Public views wanted on plans to release White-tailed eagles in Cumbria, Wales, Severn Estuary & Exmoor

Predictable backlash from NFU to proposed releases of White-tailed Eagles


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RANGER NOTES
White-Tailed Eagles on Exmoor



Figure 28. A selection of press reports *(Somerset County Gazette, February 2025 (top left), Exmoor Magazine, Autumn 2024 (top right), Western Morning News, December 2024 (bottom).*

Around the same time many media outlets picked up stories relating to wider conservation efforts to restore White-tailed Eagles, including in Cumbria and Wales. In addition, there were multiple stories in relation to some farmers in Scotland and their concerns around the established White-tailed Eagle population there:

The Times

The Guardian

https://www.dailymail.co.uk

Some of this reporting of the conflict in Scotland inevitably raised concerns, particularly among sheep farmers, and so the project team again made a concerted effort to offer one-to-one visits to anyone who wished to discuss the project further, as well as holding further meetings and discussions with sheep farming representatives such as the NFU, National Sheep Association and Exmoor Hill Farmers Network. The Exford meeting, described above, enabled the team to present the results of ongoing monitoring of the Isle of Wight birds, and to further discuss White-tailed Eagle behaviour and ecology.

6. Project practicalities

6.1. Project Team

The proposed project forms a core element of Roy Dennis Wildlife Foundation and Forestry England's efforts to restore the White-tailed Eagle to England and should be viewed as the second phase of that ongoing project, following the initial releases of White-tailed Eagles on the Isle of Wight. The proposed release site is situated on Exmoor National Park Authority land [redacted]. The project will be led by Zoe Smith from the Roy Dennis Wildlife Foundation, with support from Forestry England and ENPA staff in all elements of the project. The ENPA staff have an excellent relationship with a range of local stakeholders and this will greatly assist successful delivery of the project. The Roy Dennis Wildlife Foundation team will collect chicks for translocation from nests in Scotland and will fit satellite tags to the birds prior to release.

6.2. Project Steering Group

If a licence is granted, a Project Steering Group will be set-up as per the ongoing Isle of Wight project. The following organisations will be invited to join, and the final make-up of the group will be agreed with Natural England in advance of any birds being released:

- Roy Dennis Wildlife Foundation
- Forestry England
- Exmoor National Park Authority
- Natural England
- RSPB
- Somerset Wildlife Trust
- Devon Wildlife Trust
- National Trust
- North Devon Biosphere Reserve
- Country Land and Business Association
- Exmoor Hill Farming Network
- National Farmers Union
- National Sheep Association
- Greater Exmoor Shoot Association

- Game and Wildlife Conservation Trust
- Westcountry Rivers Trust
- Environment Agency
- Angling Trust
- Devon and Severn IFCA
- Quantocks Natural Landscape

An independent Chair will be appointed to the Steering Group (by RDWF/FE/ENPA) and will serve for five years, with Natural England acting as deputy chair. The core responsibilities of the group will be:

- To assist the project team with undertaking the White-tailed Eagle reinforcement project, by sharing information, experience and advice;
- To monitor and evaluate the progress of the project, to address any issues and identify any conflicts. Ensure the project's on-going compliance with all licences, regulations and agreements;
- To receive reports from the project team at each meeting to report on project progress;
- To oversee implementation of the project's reporting procedure for livestock/game shooting/fishing interests;
- To help facilitate better communication, participation and liaison, following the project's Communications Plan.

6.3. White-tailed Eagle Information/Watchpoints

Satellite tracking data and field observations will be used to closely monitor the dispersal and settlement patterns of juvenile eagles after release. Experience from the Isle of Wight and elsewhere in the species' range indicates that some individuals will disperse widely during their first two years while others may remain more local during this period. The location of the satellite tagged birds will not be actively promoted by the project team when the birds are on private land or sensitive sites, but an aspiration during the early phase of the project will be to set-up White-tailed Eagle viewpoints in suitable locations with sufficient visitor infrastructure. A flexible approach will need to be taken in view of the unpredictable nature of the initial movements of the released

birds. It is very likely that a partnership approach with other landowners and nature conservation organisations will be required.

As the project progresses and the first breeding pairs become established it would be beneficial to establish at least one public viewpoint at an active nest at a site capable of supporting the expected footfall, but this is dependent on where the birds settle to breed.

A comprehensive Visitor Management Strategy covering these various issues will be developed and shared with Natural England prior to any birds being released.

6.4. Number of birds to be released

The initial aim of the project is to enhance the geographical distribution of White-tailed Eagles in southern England, and should be viewed within these wider efforts. We propose to release a total of up to 20 White-tailed Eagles on Exmoor, of an equal sex ratio, over the course of three years. Survival rates of White-tailed Eagles released on the Isle of Wight, and in Scotland and Ireland indicate that this will be sufficient to establish three breeding pairs within 50-60km of the release site within ten years. Over time, the presence of these breeding pairs will encourage other birds to settle in the region, and facilitate expansion into other parts of the South West. The annual survival of different age cohorts of birds released on the Isle of Wight is shown in Table 7 below.

Table 7. Annual survival rates of White-tailed Eagles released on Isle of Wight, according to age

Age	% Annual Survival
1CY	83.78
2CY	86.96
3CY	83.33
4CY	73.33
5CY	100.00
6CY	100.00

A population model was devised in order to plot the predicted growth of the population in the early stages (Figure 29). This model assumes that 6-7 birds, with an equal sex ratio, are released each year for a period of three years. The parameters used in the model were conservative estimates based on known survival and breeding productivity of the newly-established White-tailed Eagle population in Ireland, data from the Isle of Wight, and also from early stages of the population expansion in Scotland (Mee et al 2017) (annual survival of juveniles in their first – fourth calendar year = 81%, annual survival of all birds thereafter = 90%, breeding productivity = 0.75). This predicts that the first pair are likely to breed in the sixth year of the project and three pairs will be established by year eight. This corresponds with recruitment estimates for wild-bred birds in the Scottish population where modelling estimated the probability of reaching recruitment age at 53% and 37% for wild-bred and released birds respectively (Evans et al. 2009).

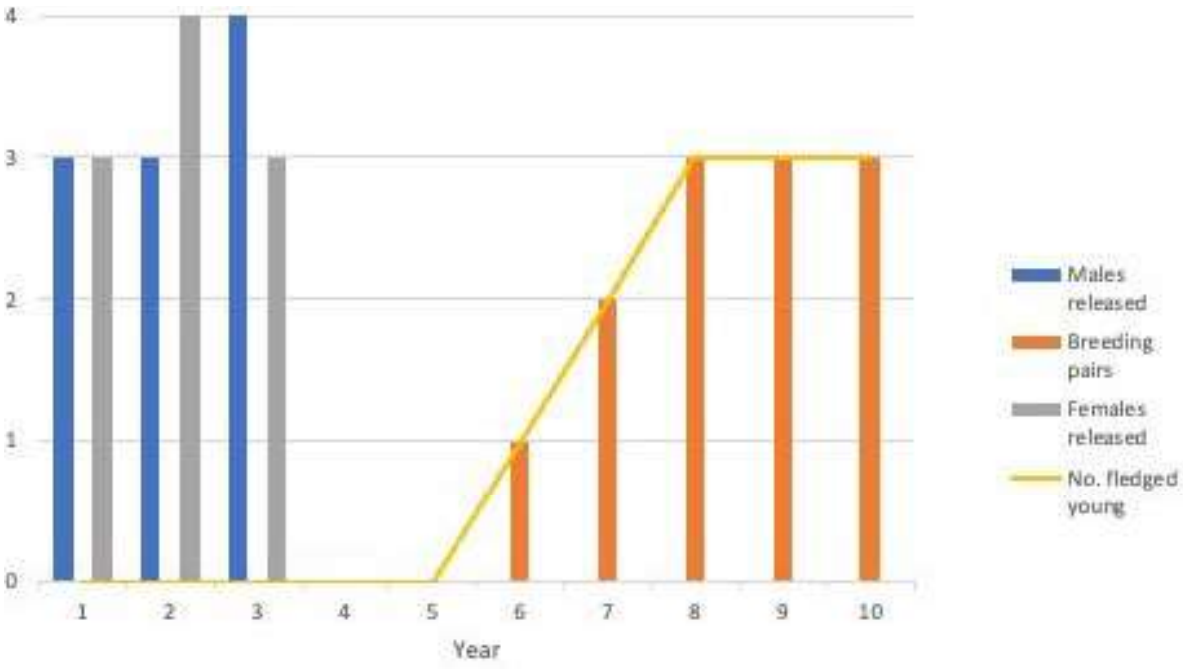


Figure 29. Expected growth of the White-tailed Eagle population in the first ten years.

It is also important to consider that high natural prey availability, and more favourable climatic conditions in southern England, indicate that breeding success of White-tailed Eagles will be higher than corresponding figures in Scotland and Ireland, and more

akin to those recorded in continental Europe, particularly the Netherlands and Denmark. The mean annual productivity of the Scottish population is 0.67 chicks per territorial pair (Sansom et al. 2016), which is considerably less than in other parts of Europe where White-tailed Eagles are breeding close to the coast. For example, the productivity of pairs situated within 10km of the Baltic Sea coast is 1.04 in Germany, 1.1 in Poland, 1.18 in Lithuania, 1.3 in Latvia, 1.02 in Estonia, 0.99-1.31 in Finland, 1.1-1.10 in Sweden and 1.52 in Denmark (HELCOM 2016). This is already proving to be the case in southern England, with three chicks fledging from the first two breeding attempts in 2023 and 2024.

It is also important to consider that dispersing birds from the establishing South Coast population may settle to join the Exmoor population once the first breeding pairs become established and this will enhance long-term sustainability. As noted earlier, this project should be viewed as the second phase of the restoration of White-tailed Eagles in southern England, following initial releases on the Isle of Wight. It is hoped that further small-scale releases will follow in two other parts of the South West as outlined by Dennis et al. (2025) to further enhance the geographical expansion of the establishing population. In addition, a White-tailed Eagle reintroduction project is also proposed for Gwent in South Wales. Any birds released in Gwent also have the potential to join the English population, and we are in regular contact with the Welsh project team.

6.5. Collection and translocation of birds from Scotland

See also Appendix 1 for greater detail on sections 6.6-6.9.

If a licence is granted by NatureScot, young birds will be collected from nests with two chicks, with one chick taken, at six to eight weeks of age and kept at suitable temporary holding sites in Scotland. If required by APHA/NatureScot, the project will follow the same Avian Influenza protocol that was in place for 2024 Isle of Wight collections. This involves different teams collecting individual eagles, and keeping them at separate locations until negative Avian Influenza test results are received (Appendix 5). At this point the birds can be transported together to England.

Only healthy young will be collected for translocation, biometrics will be taken and each will be ringed and colour ringed. Young will be taken from a maximum number of nests to ensure genetic diversity, and there are no symptoms in the Scottish population of genetic issues. Blood samples will be taken during the vet inspection for sex confirmation and maintaining a gene data base.

We have extensive experience of transporting eagles by air and land as a result of the ongoing Isle of Wight project. The project has received valuable support from Civil Air Support who have again offered assistance with the proposed Exmoor project. Flying birds from Scotland reduces transit time significantly, which reduces stress to the birds.

6.6. Release site

The project team has located a suitable release location on ENPA land in [redacted] woodland [redacted] The mixed woodland, provides ample perching opportunities in large mature trees and expansive [redacted] views. There is no public access to the site and it is relatively inaccessible due to the sloping nature of the ground.

[redacted]

(Figure 30). Like on the Isle of Wight, elevated feeding platforms will be located in front of the pens, to enable food to be provided to the birds post-release. These elevated platforms exclude mammalian scavengers such as foxes and badgers.

The whole area will be monitored by a CCTV system to ensure the eagles are not disturbed by human presence. The exact release site will be kept strictly confidential in order to prevent disturbance to the birds during the critical periods pre- and post-release.

A White-tailed Eagle released on the Isle of Wight in 2021 was present at the release site for several weeks in early 2025, thereby helping to demonstrate its suitability

(Figure 31 and 32). Much of the [redacted] is inaccessible and, as such, there are numerous quiet perching areas for juvenile eagles.



Figure 30. The view from the release site[redacted]



Figure 31. The proposed release site[redacted]



Figure 32. A wider view of the proposed release site

6.7. Release strategy

The release pens will be the same as those used on the Isle of Wight (Figure 33). They measure 4m x 4m x 2m, with exterior ply walls to the back and sides and will be built in-house by the ENPA team. An artificial nest is located at the rear of each cage and plentiful food (fish, meat) can be placed through a hatch in the back wall directly on to the nest, thereby keeping human contact to an absolute minimum. The young White-tailed Eagles need to be kept in the pens, in groups of 2-3 until they are a week past flying age. CCTV in each pen will monitor the individual eagles and will be connected by cable to the caravan or temporary project hut. The CCTV recordings will be archived and used for playback to check progress of the young. Before release all individuals will be fitted with satellite transmitters in order to monitor post-release movements. They will also be health screened by an experienced avian vet at this point. All disease risk protocols will be based on existing procedures in place for the

ongoing Isle of Wight project, including the HPAIV protocol which is included in Appendix 5.

The birds are released by lowering the front door of the pen, using a series of ropes that can be operated from the rear, to ensure that the birds are not flushed, and leave the pens at their own volition.



Figure 33. A newly-arrived White-tailed Eagle chick in the Isle of Wight release pens.



Figure 34. Two juvenile White-tailed Eagles on the Isle of Wight, satellite-tagged and ready to be released.

Like on the Isle of Wight, the birds will be fitted with Ornitela GSM satellite transmitters to enable very high temporal resolution data collection (Figure 34). This will allow the project team to monitor the daily movements of the released birds in detail, particularly during spring-autumn when battery voltage in the solar-powered transmitters is highest. The project team will also endeavour to make visual contact with each individual White-tailed Eagle on a regular basis, and several times a week during the initial stages. Field observations have been key in the ongoing monitoring of the Isle of Wight birds. The high-resolution tracking also enables nigh time roosts to be located, which greatly facilitates collection of prey remains and pellets. We will also seek the help of local communities and birdwatchers with requests to report sightings to the project through a dedicated website and social media presence.

6.8. Post-release feeding

Young White-tailed Eagles are dependent on their parents for food for several months after they leave the nest. We will provide food on the elevated feeding tables close to the release pens (see above and Appendix 1) to replicate this behaviour. Our aim is to maintain these feeding sites throughout the autumn and winter so that the young do

not disperse too rapidly and can build up group dynamics. If some birds move and settle in new areas, we will examine the potential of creating carrion feeding sites in those areas, though this has not been required on the Isle of Wight.

6.9. Ongoing monitoring

Ongoing monitoring will be an essential element of the project both in terms of the welfare of the birds and their impact on existing fauna and economic interests. As noted above, the birds will all be fitted with satellite transmitters prior to release to enable the project team to accurately monitor their subsequent movements.

Previous research has shown that juvenile White-tailed Eagles may disperse widely in their early years, and this behaviour is expected in birds released in the south-west. During this immature dispersal phase efforts will be made by the project team to liaise with key local stakeholders and to monitor the bird visually on a regular basis whenever possible. Summary satellite tracking data will be published on the Roy Dennis Wildlife Foundation website, although the project will not publicise the locations of birds if they are on private land or sensitive sites. The project team are extremely experienced in monitoring raptors by satellite tracking and any unusual movements or loss of data will be investigated with the utmost urgency. Likewise, the satellite tracking data will be helpful in identifying any potential nest building activity, as per the ongoing Isle of Wight project. This enables the project team to take a proactive approach with stakeholders in areas where the eagles settle.

The project team will devise a comprehensive Monitoring and Evaluation Plan to complement work already being undertaken as part of the Isle of Wight project. This will be shared with Natural England before any birds are released. There is potential for PhD/MSc research to contribute to this, and so a key element of the project's monitoring work is to establish partnerships with universities. An annual Monitoring and Evaluation report will be produced each year.

6.10. Exit strategy

As described in section 6.1, a project steering group will be established to review the annual progress of the project. Given the success of other White-tailed Eagle reintroduction projects in Scotland and Ireland, our ongoing efforts on the Isle of Wight,

the distribution of the species in other parts of lowland Europe, and the measures included in this feasibility report, we are confident that the project will result in a self-sustaining population of White-tailed Eagles becoming established in South West England without causing any ecological or socio-economic problems. Nevertheless, there is potential to halt the project should any unforeseen issues arise. The project will be reviewed annually by the steering group and if there was clear evidence that it was causing ecological or socio-economic harm a decision could be made to implement the exit strategy at any point in the first three years of the project. The process by which such a decision would be reached is outlined in Appendix 2.

If it proved necessary to implement the exit strategy, efforts would be made to catch any free-living White-tailed Eagle released by the project. Individual raptor workers have become expert at catching adult eagles for satellite-tracking studies using bow traps. The project team have consulted with these expert fieldworkers who have agreed to assist the project with trapping should it be required. The project team has the necessary skills to assist, and we would request the services of other experienced bird ringers to provide additional support. The project team have a bow trap that can be operated remotely at a distance of up to a mile. Any re-captured birds would be housed temporarily at the release site before being transported back to Scotland and re-released in their original natal areas once the necessary permissions had been secured.

Clearly the logistics and costs of implementing the exit strategy would depend on how far the project had progressed, and as such, it will be essential to review any impacts of the project on an annual basis. Here we have estimated the costs of implementing the exit strategy in year 3, based on expected survival of the birds after release (annual survival of immature eagles during this period = 81% - see section 6.5).

6.10.1. Example exit strategy in year 3 (i.e. after two years of releases)

The juvenile eagles will be supplementary fed close to the release site during their first winter, and it would be relatively straightforward to catch the birds during this period. However, it is likely that some birds will begin to move away from the release site two-six months after release. If six birds were released in the first year of the project we would expect four individuals to be alive two years after release. Likewise, if seven

birds had been released in year two, five would likely be alive in year three. By this stage all of these birds may have dispersed widely across England. It will be possible to monitor these movements closely using satellite tracking and this will make it considerably easier to catch birds during this period. Favoured roost sites will be pinpointed using the satellite data and bow traps set-up at these locations. Once caught the birds would be transported back to the area in which they were collected as soon as possible. Estimated costs of this work are shown in Table 13.

Table 8. Estimated costs of exit strategy [redacted]



6.10.2. Catching individual birds

In addition to implementing the full exit strategy, it would also be possible to catch individual birds if there was clear evidence of a particular individual causing severe socio-economic or ecological damage. A separate licence would be required from Natural England for this, as outline in Appendix 2.

If it was deemed necessary to capture a problem bird, arrangements would be made to catch the individual using the project's bow trap. The bird would then be transferred to a suitable licenced locality such as a wildlife park or falconry centre, to be kept in permanent captivity.

In addition, any ill or injured birds (pre- or post-release) would be assessed by an experienced avian vet. If (re-)release was not possible, a decision would then be taken

to either transfer the bird to a suitable wildlife park or falconry centre, or to euthanise it, depending on the vet's recommendations.

6.10.3. Funding

We can confirm RDWF/FE/ENPA has the required contingency funds to carry out all aspects of the exit strategy as detailed here.

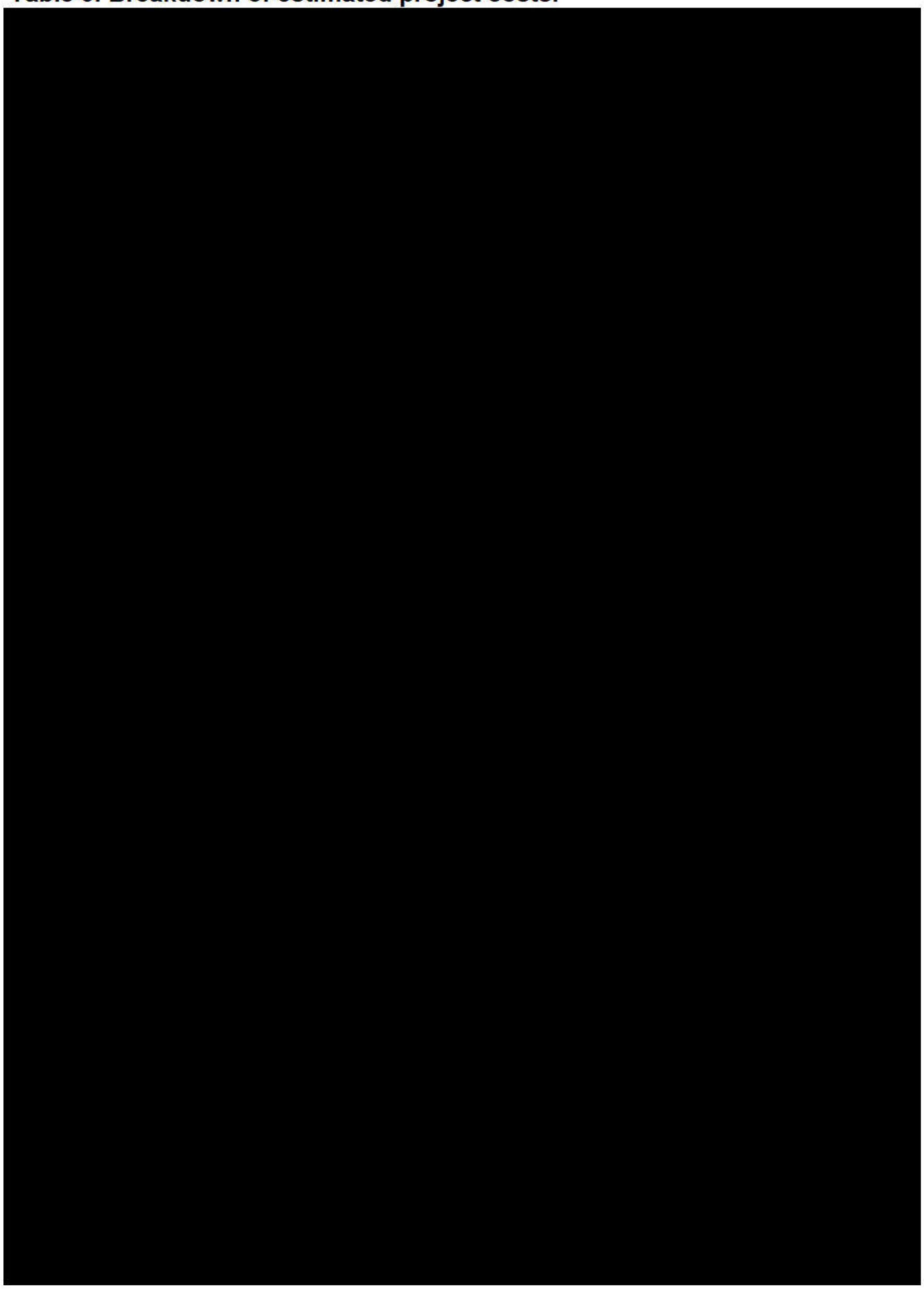
6.11. Communications strategy

The project team have been working to an agreed communications strategy for the development phase of the project. Given the likely high-profile nature of the project, an additional communications strategy will be developed for the implementation phase and shared with Natural England before any birds are released.

6.12. Funding

The budget for the project is shown in Table 9. Funding for a full-time project officer has been secured by Roy Dennis Wildlife Foundation. In addition, Forestry England aim to secure funding for a South West Eagle officer. This person would support the Project Officer in delivering the Exmoor project, with a view to taking a leading role in additional releases at a second site in South West England. Funding for capital costs at the release site will be provided by ENPA while funding for satellite tracking equipment will be covered by RDWF/FE. ENPA is also providing significant in-kind funding through staff costs which are not shown in Table 9.

Table 9. Breakdown of estimated project costs.



6.13. Key project milestones

6.13.1. Release of 20 juvenile White-tailed Eagles

The project aims to release a total of 20 White-tailed Eagles over a three-year period. This would involve the translocation of six-seven birds per year.

Once the full complement of 20 birds have been translocated, the project team will review the survival in order to make an objective assessment of whether any further releases are required. Population modelling (Section 6.5) indicates that the release of 20 birds will be sufficient to establish an initial local breeding population of three pairs if survival to five years is 35-40% (as per Scottish reintroduction). Thus, additional releases would only be required if survival was lower than this figure. A clear understanding of the reasons for higher-than-expected mortality would be required before the release of any further birds would be considered.

6.13.2. First breeding attempts

White-tailed Eagles do not reach breeding age until approximately five years, and so the first breeding attempts are not expected until 2030 if the first birds were released in 2025. Furthermore, the inexperience of first-time-breeders means that initial attempts may fail. The project team will closely monitor any breeding activity and liaise closely with landowners to ensure the birds are not disturbed. This will give the birds the maximum chance of success.

6.13.3. First successful breeding

The first successful breeding attempt by birds released on Exmoor will be a significant milestone for the project, as it was when White-tailed Eagles nested for the first time following the releases on the Isle of Wight. This is likely to occur five years after the first juveniles are released, although as the experience in southern England shows, it could occur earlier. Once established, breeding White-tailed Eagles show strong site fidelity and, as such, these breeding birds will be key to the establishment of the population. Annual survival of breeding adults will be closely monitored by the project team. In Ireland, additional releases were deemed necessary due to mortality of key breeding adult birds (to a variety of causes) and a very poor breeding season in 2019. As such, the productivity of breeding pairs, and annual survival of breeding adults will

be reviewed on an annual basis. If breeding adults are lost, or breeding success is very low, consideration could be given to further releases of juvenile birds in order to supplement the establishing population, assuming the causes of mortality and breeding failure are clearly understood.

6.13.4. Breeding of first wild-fledged chick

The key to the establishment of a self-sustaining population of White-tailed Eagles is that wild-fledged birds begin to breed themselves. In Ireland this occurred for the first time in 2020, thirteen years after the first birds were released. However, there is potential for this to happen more quickly, particularly if breeding productivity of early pairs is high.

6.13.5. Establishment of a population of 3 pairs

Population modelling shows that the release of 20 birds Exmoor will result in the establishment of a population of three breeding pairs, likely within 50 km of the release site. This is expected to occur within ten years of the first release. This will help to facilitate the geographical expansion of the establishing southern England population because dispersing wild-fledged juveniles from elsewhere are more likely to join the local population if there are territory holding birds. Annual breeding attempts and geographical expansion of the population will be closely monitored throughout this period. Further releases in two other locations in South West England will further aid the restoration of the species in the region (Dennis et al. 2025).

References

Adamski A., Lontkowski J., Maciorowski G., Mizera T., Rodziewicz M., Stawarczyk T., Wacławek K. 1999. Rozmieszczenie i liczebność rzadszych gatunków ptaków drapieżnych w Polsce w końcu 20.wieku. Notatki Ornitologiczne 40 (1-2): 1-22.

Anderwald D., Przybyliński T. 2011. Porównanie populacji lęgowej bielika *Haliaeetus albicilla* w Pradolinie Warszawsko-Berlińskiej PLB100001 i na Wielkim Sandrze Brdy PLB 220001. Stud. i Mat. CEPL, Rogów, 2 (27): 105-113.

Anderwald, D., Przybyliński, T. and Zawadzka, D. 2013. Best Practice Manual for the Protection of the Birds of Prey. Lasy Pañstwowe (Polish State Forests)

Augère-Granier, M.L. 2020. The EU pig meat sector. EPRS | European Parliamentary Research Service.

Angling Trust. 2023. https://anglingtrust.net/2023/04/17/devon-severn-netting-byelaw-soon-under-review/

Belka, T. and Horal, D. 2009. The White-tailed Eagle (Haliaeetus albicilla) in the Czech Republic. Denisia 27: 65-77.

Bell, D. 2020. Losing lagomorphs to disease. BTO Research Report 726 ed. Thetford: British Trust for Ornithology

Bestman, M. and Bikker-Ouwejan, J. 2020. Predation in Organic and Free-Range Egg Production. Animals 10: 177; doi:10.3390/ani10020177

Blue Marine Foundation. 2021. Proceedings of Cuttlefish Symposium. https://www.bluemarinefoundation.com/wp-content/uploads/2022/05/Blue-Marine-Foundation-Cuttlefish-Symposium-Proceedings-Report_WEB-FINAL.pdf

Burton, N.H.K., Armitage, M.J.S., Musgrove, A.J. & Rehfisch, M.M. 2002. Impacts of man-made landscape features on numbers of estuarine waterbirds at low tide. Environ. Manage. 30: 857–864.

Butterowrth, A and Burt, A. 2018. Vulnerability and Over-Exploitation of Grey Mullet in UK Waters. National Mullet Club. https://www.thenationalmulletclub.org/Vulnerability_and_Over-Exploitation_of_Grey_Mullet_in_UK_Waters_v2.pdf \

BirdLife International. 2015. European Red List of Birds. Luxembourg: Office for Official Publications of the European Communities.

Border, J.A., Massimino, D., and Gillings, S. 2018. Potential Future Distribution and Abundance Patterns of Common Buzzards Buteo buteo. Research Report 707 British Trust for Ornithology: Thetford, UK.

Bridge, D. 2024. The Great Crane Project. RSPB website (https://www.rspb.org.uk/whats-happening/news/the-great-crane-project)

Burton, N.H.K., Armitage, M.J.S., Musgrove, A.J. & Rehfisch, M.M. 2002. Impacts of man-made landscape features on numbers of estuarine waterbirds at low tide. Environ. Manage. 30: 857–864.

Collop, C., Stillman, R.A., Garbutt, A., Yates, M.G., Rispin, E. & Yates, T. 2016. Variability in the area, energy and time costs of wintering waders responding to disturbance. The Ibis 158: 711–725.

Cramp, S. 1980. Handbook of the Birds of Europe, the Middle Eastand North Africa: The Birds of the Western Palearctic. Vol. II: Hawks to Bustards. Oxford UK: Oxford University Press.

Delibes, M. and Hiraldo, F. 1981. The rabbit as prey in the Iberian Mediterranean ecosystem. In: Proceedings of the World Lagomorph Conference, Guelph, 1979 (Ed. by C.D. MacInnes & K. Myers), pp. 614–622. University of Guelph, Guelph, Canada.

Dementavičius, D., Rumbutis, S., Virbickas, T., Vaitkuvienė, D., Dagys, M. and Treinys, R., 2020. Spatial and temporal variations in the White-tailed Eagle *Haliaeetus albicilla* breeding diet revealed by prey remains. Bird Study 67(2): 206-216.

Dennis, R.H., Doyle, J., Mackrill, T.R. and Sargeant, L. 2019. The feasibility of reintroducing White-tailed Eagles *Haliaeetus albicilla* to the Isle of Wight and the Solent.

Dennis, R.H., Smith, Z. Egerton-Read, S. and Mackrill, T.R. 2025. Review of White-tailed Eagle reintroduction to England and the feasibility of future proactive recovery. Roy Dennis Wildlife Foundation.

Dunn, M. 2022. Public Perceptions on the Reintroduction of White- tailed Eagles to the Isle of Wight and the Solent. Forest Research. https://cdn.forestresearch.gov.uk/2023/02/WTE-public-perceptions-final-report-Dec-2022-1.pdf

Ekblad, C. M. S., Sulkava, S., Stjernberg, T. G. & Laaksonen, T. K. 2016: Landscape-scale gradients and temporal changes in the prey species of the White-tailed Eagle (Haliaeetus albicilla). Ann. Zool. Fennici 53: 228–240.

Ekblad, C., Tikkanen, H., Sulkava, S. et al. 2020. Diet and breeding habitat preferences of White-tailed Eagles in a northern inland environment. Polar Biol 43, 2071–2084 https://doi.org/10.1007/s00300-020-02769-1

Estes, J.A., Terborgh, J., Brashares, J.S., Power, M.E., William, J.B., Bond, J., Carpenter, S.R., Essington, T.E., Holt, R.D., Jackson, J.B.C., Marquis, R.J., Oksanen, L., Oksanen, T., Paine, R.T., Pikitch, E.K., Ripple, W.J., Sandin, S.A., Scheffer, M., Schoener, T.W., Shurin, J.B., Sinclair, A.R.E., Soulé, M.E., Virtanen, R. and Wardle, D.A. 2011 Trophic Downgrading of Planet Earth. Science 333 (6040): 301-306.DOI: 10.1126/science.1205106

Evans, R.J., Broad, R.A., Duffy, K., MacLennan, A.M.,Bainbridge, I.P. and Mudge, G.P. 2003. Re-establishment of a breeding population of White-tailed Eagles in Scotland. In Helander, B., Marquiss, M. & Bowerman, W. (eds) Sea Eagle 2000. Proceedings from an International Conference at Björkö, Sweden, 13–17 September 2000: 397–403. Swedish Society for Nature Conservation, Stockholm.

Evans R.J, Wilson J.D., Amar A., Douse A., MacLennan A., Ratcliffe N. and Whitfield D.P. 2009 Growth and demography of a reintroduced population of White-tailed Eagles Haliaeetus albicilla. Ibis 151: 244–254.

Evans, R.J., O'Toole, L. and Whitfield, D.P. 2012 The history of eagles in Britain and Ireland: an ecological review of place name and documentary evidence from the last 1500 years. Bird Study, 59:3, 335-349.

Exmoor National Park Authority. 2023. State of the Park Report 2023. https://www.exmoor-nationalpark.gov.uk/__data/assets/pdf_file/0019/5626/State-of-Park-2023-for-website.pdf

Ferrer, M. & Negro, J.J. 2004. The near extinction of two large European predators: super-specialists pay a price. Conservation Biology, 18: 344–349.

Fischer W. 1984. Die Seeadler. A. Ziemsen Verlag, Lutherstadt Wittenberg.

Gryz, J. and Krauze-Gryz, D. 2019. Pigeon and Poultry Breeders, Friends or Enemies of the Northern Goshawk Accipiter gentilis? A Long-Term Study of a Population in Central Poland. Animals 9: 141 doi:10.3390/ani9040141

Gibbons, D. W., Reid, J.B. and Chapman, R. A. 1993 The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991. T & AD Poyser, London.

Hailer, F., B. Helander, A.O. Folkestad, S.A. Ganusevich, S. Garstad, P. Hauff, C. Koren, V.B. Masterov, et al. 2007. Phylogeography of the white tailed eagle, a generalist with large dispersal capacity. Journal of Biogeography 34: 1193–1206.

Helander, B. and Stjernberg, T. 2002. Action plan for the conservation of White-tailed Sea Eagle (Haliaeetus albicilla). Council of Europe unpublished Report.

Helander, B., Bignert, A. and Asplund, L. 2008. Using Raptors as Environmental Sentinels: Monitoring the White-tailed Sea Eagle *Haliaeetus albicilla* in Sweden. AMBIO: A Journal of the Human Environment. 37(6): 425- 431.

HELCOM. 2016. White-tailed Eagle productivity. HELCOM core indicator report. Online.

Horváth, Z. and Pintér, T. 2003. A hazai rétisas (Haliaeetus albicilla)- állomány fészkelőhely-választása a 2000. év felmérése alapján. Aquila 112: 23–32 (in Hungarian).

Houston, A.I., Prosser, E. & Sans, E. (2012). The cost of disturbance: a waste of time and energy? Oikos 121: 597– 604.

Isomursu, M., Koivusaari, J., Stjernberg, T., Hirvelä-Koski, V. and Venäläinen, E.R., 2018. Lead poisoning and other human-related factors cause significant mortality in White-tailed Eagles. Ambio, 47(8): 858-868.

JNCC 2025. Annex II species https://sac.jncc.gov.uk/species/

Källander, H. 2018. Flock-fishing deep-diving piscivores (Great Crested Grebe Podiceps cristatus, Great Cormorant Phalacrocorax carbo, Common Merganser Mergus merganser) at Lake Vombsjön, southern Sweden, and those that exploit them. Ornis Svecica 28(1): 14-18.

Kamarauskaitė, A., Dementavičius, D., Skuja, S., Dagys, M. and Treinys, R. 2020. Interaction between the White-tailed Eagle and Common Buzzard estimated by diet analysis and brood defence behaviour. Ornis Fennica 97(1): 26-37.

Keniger, L.E.; Gaston, K.J.; Irvine, K.N.; Fuller, R.A. What are the benefits of interacting with nature? Int. J. Environ. Res. Public Health 2013, 10, 913–935.

Knott, J, P. Newbery, and B. Barov (2009). Action plan for the red kite Milvus milvus in the European Union, 55 p.

Kiss, J.B., Marinov, M., Alexe, V., Sándor, D.A. 2013. Situaţia actuală şi preferinţele faţă de locurile de cuibărit ale codalbului (Haliaeetus albicilla) în Delta Dunării (România). Rev Silvic. Cineget 32: 139–142 (in Romanian).

Kristensen, M.L., Righton, D., del Villar-Guerra, D., Baktoft, H. and Aarestrup, K. 2018. Temperature and depth preferences of adult brown trout Salmo trutta during the marine migration phase. Mar Ecol Prog Ser 599:209–224.

Krone, O., Langgemach, T.P., Sommer, P., Kenntner, N. 2000. Causes of mortality in white-tailed sea eagles from Germany. In: Sea Eagle 2000 – an international conference. Bjorko, Sweden. Swedish Society for Nature Conservation / SNF. Pp211-218.

Krone, O., Berger, A., Schulte, R. 2008 Recording movement and activity pattern in a white-tailed sea eagle (Haliaeetus albicilla) by a GPS datalogger. Journal of Ornithology DOI: 10.1007/s10336-008-0347-1.

Krüger, O., Grünkorn, T. and Struwe-Juhl, B., 2010. The return of the White-tailed Eagle (Haliaeetus albicilla) to northern Germany: Modelling the past to predict the future. Biological Conservation, 143(3): 710-721.

Lourenço, R., Penteriani, V., Rabaça, J.E. and Korpimäki, E., 2014. Lethal interactions among vertebrate top predators: a review of concepts, assumptions and terminology. Biological Reviews 89(2): 270-283.

Lees, A. & Bell, D.J. 2008. A conservation paradox for the 21st century: the European wild rabbit Oryctolagus cuniculus, an invasive alien and an endangered native species. Mammal Review 38: 304–320.

Lontkowski J., Stawarczyk T., 2003. Rozwój populacji, wybiórczość siedliskowa i efekt rozrodu bielika *Haliaeetus albicilla* na Śląsku w latach 1993-2001. Notatki Ornitologiczne 44(4): 237-248.

Lourenço, R., Penteriani, V., Rabaça, J.E. & Korpimäki, E. 2014: Lethal interactions among vertebrate top predators: a review of concepts, assumptions and terminology. Biological Reviews 89: 270-283.

Love, J. 2006. Sea Eagles: Naturally Scottish. Scottish Natural Heritage, Perth.

Love, J.A. 2013. A Saga of Sea Eagles. Whittles Publishing, Dunbeath

Mackrill, T.R., Appleton, T.P. and McIntyre, H. 2013. The Rutland Water Ospreys. Bloomsbury, London.

Manchester, S.J. and Bullock, J.M. 2000. The impacts of non-native species on UK biodiversity and the effectiveness of control. Journal of Applied Ecology 37: 845-864.

Marinov, M., Dorosencu, A., Alexe, V., Bolboaca, L.E., Kiss, J.B., Nanu, C., Tosic, K. and Tudor, M., 2019. Recent data regarding colonial waterbirds in Danube Delta Biosphere Reserve (Romania). Journal of Environmental Protection and Ecology 1: 276-284.

Marquiss, M. & Madders, M. & Carss, D. N. 2003. Diet of Breeding White-tailed Eagles in Scotland, particularly on the Island of Mull 2002. Report to SNH, on contract IB020303T, March 2003. 24pp

Marquiss, M., Madders, M., Irvine, J. and Carss, D.N. 2004. The Impact of White-tailed Eagles on Sheep Farming on Mull. Report to SNH, on contract ITE/004/99. 48pp.

Mebs, T. & Schmidt, D. 2006: Die Greifvögel Europas, Nordafrikas und Vorderasiens: Biologie, Kennzei- chen, Bestände. Kosmos, Stuttgart. (In German)

Mee, A. 2017. Irish White-tailed Sea Eagle Reintroduction Project Report 2017. Golden Eagle Trust.

Mee, A. 2020. Irish WTSE Reintroduction Project Summary 2020. Report to UK White-tailed Eagle Project Team annual meeting.

Mee, A., Breen, D., Clarke, D., Heardman, C., Lyden, J., McMahon, F., O'Sullivan, P., O'Toole, L. 2016. Reintroduction of White-tailed Eagles Haliaeetus albicilla to Ireland. Irish Birds 10: 301-314.

Mee, A., Heardman, C., Clarke, D., Nygård, T. Meskell, E. and Buckley, P. 2024. Reintroduction of White-tailed Eagle to Ireland: Re-establishing a Top Avian Predator. In: Mikuska T., Mikuška A. (eds.) White-tailed Eagle conference 2024. Strengthening White- tailed eagle network toward Southern Europe and Mediterranean countries. Book of Abstracts, 15th – 21st September 2024, Osijek; Croatian Society for Birds and Nature Protection, Osijek, 54 pp.

Mlíkovský, J. 2009. The food of the white-tailed sea eagle (Haliaeetus albicilla) at Lake Baikal, East Siberia. Slovak Raptor Journal 3: 35–39.

Mizera, T., Szymkiewicz, M. 1991. Trends, status and management of the White-tailed Sea Eagle *Haliaeetus albicilla* in Poland, Birds of Prey Bulletin No 4.

Morgan, A. 2023. Avalon Marshes New Colonists Monitoring Group Report 2023.

Mrugasiewicz A. 1984. Bielik *Haliaeetus albicilla* w dolinie Baryczy. Dol. Baryczy 3: 1-27.

Mikuska, T. Ham, I., Rožac, V. Vereš, M. and Mikuska, A. 2024. Breeding Density of White-tailed Eagles – How dense can it be? In: Mikuska T., Mikuška A. (eds.) White-tailed Eagle conference 2024. Strengthening White-tailed eagle network toward Southern Europe and Mediterranean countries. Book of Abstracts, 15th – 21st September 2024, Osijek; Croatian Society for Birds and Nature Protection, Osijek

Mizera T. 1999. Bielik. Lubuski Klub Przyrodników, Świebodzin.
Molloy, D, 2011. Wildlife at work. The economic impact of White-tailed Eagles on the Isle of Mull. The RSPB, Sandy.

Nadjafzadeh, M., Voigt, C.C., and Krone, O. 2015. Spatial, seasonal and individual variation in the diet of White-tailed Eagles *Haliaeetus albicilla* assessed using stable isotope ratios. Ibis 158(1): 1-15.

Nadjafzadeh, M., Hofer, H. and Krone, O. 2016. Sit-and-wait for large prey: foraging strategy and prey choice of White-tailed Eagles. 157: 165–178

NatureScot. 2020. White-tailed Eagle Action Plan Review 2020.

Neumann, J. & Schwarz, J. 2017: Seeadlerpaar mit beson- derer Vorliebe für junge Mäusebussarde. Teil 3. Großvogelschutz im Wald (Jahresberichte 2017): 28-30. (In German).

Nygård, T., Halley, D. and Mee, A. 2009. The reintroduction of the White-tailed Eagle to Ireland. Project report 2009.

Office for National Statistics 2023. ONS website: Statistical bulletin, National Park residents, England and Wales: Census 2021

Öst M, Lindén A, Karell P, Ramula S, Kilpi M (2018) To breed or not to breed: drivers of intermittent breeding in a seabird under increasing predation risk and male bias. Oecologia 188: 129- 138

Palomares, F., Delibes, M., Revilla, E., Calzada, J. & Fedriani, J.M. 2001. Spatial ecology of Iberian lynx and abundance of European rabbits in southwestern Spain. Wildlife Monographs, 148, 1–36.

Rajchard, J., Procházka, J., Šmahel, L. 2010. Nest sites and reproductive success of a restored population of White-tailed Eagles in the Czech Republic. J Rapt Res 44: 243–246.

Radović, A., Mikuska, T. 2009. Population size, distribution and habitat selection of the White-tailed Eagle *Haliaeetus albicilla* in the alluvial wetlands of Croatia. Biologia 64: 156–164.

van Rijn, S.V., Zijlstra, M. and Bijlsma, R.G. 2010. Wintering White-tailed Eagles *Haliaeetus albicilla* in The Netherlands: aspects of habitat scale and quality. Ardea 98: 373–382.

van Rijn, S.H.M. and J.J.A. Dekker 2016. Zeearenden in Nederland. Een kennisoverzicht van de verzamelde gegevens tot en met 2016. Rapport 2016-03.

Reid, R., Grant, J.R., Broad, R.A., Carss, D.N. and Marquiss, M., 2023. The breeding season diet of White-tailed Eagles in Scotland. Scottish Birds 43: 305-318.

Sándor, D., Alexe, V., Marinov, M., Doroşencu, A., Domşa, C. & Kiss, B. 2015. Nest-site selection, breeding success, and diet of White-tailed Eagles *Haliaeetus albicilla* in the Danube Delta, Romania. Turkish Journal of Zoology 39: 300–307.

Salo, P., Nordström, M., Thomson, R.L., and Korpimäki, E. 2008. Risk induced by a native top predator reduces alien mink movements. Journal of Animal Ecology 2008, 77, 1092–1098.

Sansom, A., Evans, R. and Roos, S. 2016. Population and future range modelling of reintroduced Scottish White-tailed Eagles *Haliaeetus albicilla*. Scottish Natural Heritage Commissioned Report No. 898.

Sergio, F., Newton, I., Marchesi, L. and Pedrini, P. 2006. Ecologically justified charisma: preservation of top predators delivers biodiversity conservation. Journal of Applied Ecology 43: 1049-1055. doi:10.1111/j.1365-2664.2006.01218.x

Simberloff, D. 1998. Flagships, umbrellas, and keystones: Is single-species management passé in the landscape era? Biological Conservation 83(3): 247-257.

Simms, I. C., Ormston, C.M., Somerwill, K. E., Cairns C.L., Tobin, F.R., Judge. J. & Tomlinson, A. 2010. A pilot study into sea eagle predation on lambs in the Gairloch area - Final Report. Scottish Natural Heritage Commissioned Report No.370.

Stamp, T. 2021. The Ecology and Distribution of European Bass (Dicentrarchus labrax) in inshore and coastal waters of the U.K. PhD thesis. University of Plymouth.

Stanbury, A. and UK Crane Working Group. 2011. The changing status of the Common Crane in the UK. British Birds 104: 432–447

Sulkava, S., Tornberg, R. and Koivusaari, J. 1997. Diet of the White-tailed Eagle *Haliaeetus albicilla* in Finland. Ornis Fenn 74: 65–78.

Thomson, J.M., 1986. Mugilidae. p. 344-349. In J. Daget, J.-P. Gosse and D.F.E. Thys van den Audenaerde (eds.) Check-list of the freshwater fishes of Africa (CLOFFA). ISNB, Brussels, MRAC; Tervuren; and ORSTOM, Paris. Vol. 2.

Tulloch, A.I.T., Nicol, S. and Bunnefeld, N. 2017. Quantifying the expected value of uncertain management choices for over-abundant Greylag Geese. Biological Conservation 214: 147-155

Walls, S and Kenward, R. 2020. The Common Buzzard. Bloomsbury, London.

Watson, J.W., Garrett, M.G. and Anthony, R.G., 1991. Foraging Ecology of Bald Eagles in the Columbia River Estuary. The Journal of Wildlife Management 492-499.

Whitfield, D.P., Douse, A., Evans, R.J., Grant, J., Love, J., McLeod, D.R.A., Reid, R. Wilson, J.D. 2009 Natal and breeding dispersal in a reintroduced population of White-tailed Eagles Haliaeetusalbicilla , Bird Study 56(2): 177-186.

Whitfield, D.P., Marquiss, M., Reid, R., Grant, J., Tingay, R. and Evans, R.J. 2013 Breeding season diets of sympatric White-tailed Eagles and Golden Eagles in Scotland: no evidence for competitive effects. Bird Study 60(1): 67-76.

Wille, F. and Kampp, K. 1983. Food of the White-tailed Eagle Haliaeetus albicilla in Greenland. Holarctic Ecology 6: 81–88.

Yalden, D.W. 2007. The older history of the White-tailed Eagle in Britain. British Birds 100: 471–480

Vrezec, A., Bordjan, D., Perušek, M., Hudoklin, A. 2009. Population and ecology of the White-tailed Eagle (Haliaeetus albicilla) and its conservation status in Slovenia. Denisia 27: 103–114.



Location choice and design of release cages

Collecting, rearing & release techniques

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Introduction

This expert guide has been compiled to help persons or groups contemplating raptor reintroductions, translocations and releases; it is based on detailed field experience of White-tailed Eagles *Haliaetus albicilla* but has relevance to other species. We have gained huge experience of successfully reintroducing and translocating a range of European raptors over the last five decades. Many people have been involved but we particularly value the ideas and experience of John Love, Colin Crooke, Allan Mee, Lorcan O'Toole and Steve Egerton-Read.

In this report we do not cover the important stages leading up to the start of a reintroduction or translocation, namely the identification of the need to restore a lost species to a region or country, the choice of region and its suitability for successful recovery, nor the production of feasibility reports or the successful grant of the necessary licences from the appropriate authorities. This guide describes the practical work required following approval.



Identification of release site (hacking site)

One of the most important features for the successful translocation of young White-tailed Eagles is the selection of an optimum release area. Initially, there is the choice of a region or country for the re-establishment of a breeding population of the species, and then the local choice for the best release (hacking) site within that region. The latter is covered in this information note.

The location we selected on Forestry England land on the Isle of Wight for the first phase of the English reintroduction, has proved very successful, and enable us to refine the criteria required for the best possible release site. It contrasts with the open coastal locations used at Fair Isle (1968) and the island of Rum (1975-1986). The site at Loch Maree in Wester Ross in the early 1990s proved successful in having the release cages close to an open field ‘feeding area’ within a wooded fringe, which is similar to the location on the Isle of Wight.

The main aim of a project is to restore a viable and increasing population in a region where they used to breed. This is the goal. The method is to release successfully all of the translocated young in optimum condition and to encourage all of them to remain close to the release cages for several months to ‘mimic’ the behaviour of recently fledged eaglets in the wild. There the parents continue to bring food for the newly fledged young in the close proximity of the nest site for several months, although the young start to follow the adults for food provision within the home range. A key role of staff involved in a reintroduction project, therefore, is to provide a large amount of food during this important post-release stage, in a location where the birds are not disturbed.

The founder population needs to be of sufficient size to establish a viable self-sustaining population. However, we recommend the release of a maximum of 10 at any one site due to hierarchical competition at the feeding site during post-fledging.

The cages should look out over good habitat. Ideally, they should have a good view of the sky and the horizon, the outline of hills and the location of woods, lakes, rivers, estuaries or open coast. This allows the eaglets to observe the local surroundings, the

activities of local wildlife, and the transit of the sun and the movement of stars in the night sky, as they grow and develop in the hacking cages. The cages should be built on a piece of flat ground and the birds, while in the cages, should be able to look out at old trees, live or dead, with large branches suitable for perching. The trees can be solitary or in groups of very big trees with open branches ideal for the young to fly to and perch, when they make their first hesitant flights from the release cages, and easy for them to return to after making more sustained flights. We recommend that the cages do not face south in order to prevent overheating.



Figure 1. View from the release pens on the Isle of Wight.

The other important aspect of location is that there should be a sizeable open area, of at least two hectares, in front of the release cages or close to it, surrounded partly or wholly by large trees, which will become the main feeding place during the early months after release. This should be visible to the birds in the cages, so that some carrion food can be placed there from a couple of days prior to the release, allowing them to see corvids and buzzards, for example, flying down to feed. This food should be placed on elevated platforms during night time, to avoid the eagles seeing people. There should also be a range of perches. Large fallen dead trees which can be dragged into the open field with a tractor, are ideal.

In the first week of flying the birds are very inexperienced and can make clumsy landings. It is important that the release cages are not situated near 'closed-in' woodland, especially thick young woodlands or plantations. Native trees with soft foliage, such as willows, birches, poplars, and young conifers such as spruces and firs, do not have strong top branches. Adults do not land in such places, but if inexperienced young birds try to land on them, they may fall down through the foliage and then find it extremely difficult or even impossible to regain flight. In such circumstances their only way to find an open space to fly is to walk out of the wood and this may be difficult. In some cases, birds could die before getting to an open area to regain flight. Do not, therefore, site cages close to young plantations or unsuitable woods, or for that matter close to dense reed beds, scrub, or growing crops such as cereals.

In earlier projects, it was very important that the people in charge of the release project could view the cages and release site, especially at and after the release, from a long distance with a telescope or binoculars. This distance had to be sufficient to have no influence on the behaviour of the birds. Nowadays the use of high-quality CCTV cameras within the release area makes monitoring of individual birds much better and is the most efficient method of monitoring because it can be done remotely without any chance of disturbing the birds.

Team and infrastructure

In our case the team was made up of two members of the Roy Dennis Wildlife Foundation – Roy Dennis has been involved with White-tailed Eagles since the reintroduction and release of four young Norwegian sea eagles at Fair Isle in 1968 and Dr Tim Mackrill with experience of the osprey translocation at Rutland Water from 1997; among our many other ecological restoration and species recovery projects. Our partner in the Isle of Wight White-tailed Eagle project is the government agency, Forestry England, where the regional senior ecologist Leanne Sargeant provided essential land and human resources capability. The project team appointed Steve Egerton-Read, an Isle of Wight resident, as full-time project officer; employed by Forestry England with his salary sourced from private donors through the Foundation.

The release site was on Forestry England land, while access was via a local farm. A small second-hand caravan was purchased as the base camp to house the monitors linked to CCTV cameras relay footage from each cage and the surrounding post-release feeding area. The project was supplied with a van by Forestry England; a vehicle such as this is essential for collection and supply of eagle food. Deep freezers were housed at a Forestry England site; essential for stock piling eagle food.

In Scotland, monitoring and collection of young was organised through sea eagle specialists Justin Grant, Robin Reid (Lewis/Harris), Dave Sexton (Mull), Alison MacLennan (Skye), Jamie Boyle (Uists) and others: Roy Dennis coordinated each season's activities and liaised with Scottish Natural Heritage (licensing authority) as well as contacting landowners for permissions. Tree climbers Ian Perks and Fraser Cormack, with Tim Mackrill collected young from tree nests. Young were housed at Roy Dennis's home or Robin Reid's croft before being taken to the Isle of Wight by light aircraft (courtesy of Graham Mountford) or driven to the Isle of Wight in a transit van by Tim Mackrill. It is important to check suitable nests early in the year; identifying more than is required to allow for nest failures and single chick occupancy. Only collect obviously healthy chicks.

Tim Mackrill managed the project throughout England while Steve Egerton-Read, the project officer, ran the project on the Isle of Wight. The project was helped by many people who provided funds for the project and equipment, voluntary time, supplies of eagle food and many other kindnesses.



Figure 2. Roy Dennis and Steve Egerton-Read monitoring juvenile White-tailed Eagles via CCTV at the Isle of Wight release site.

Construction of the release cages

Specially-designed hacking cages are required to house the young eagles safely and securely during the time between collection and release, a period of approximately six-seven weeks. Each cage should be able to hold up to three individual young sea eagles, as it is better for the birds to be reared in broods rather than singly. The cages built at Loch Maree in Wester Ross in the early 1990s for the release of the sea eagles, and subsequently the same design used at the Irish release site in 2007, are as good as you can get for this sort of project. The Isle of Wight cages were based on a similar design with the cages elevated five feet off the ground to prevent problems with ground scavengers/predators, such as red fox and badger.

Our latest advice for new projects is that two eaglets should be housed together in each cage, with three groups of two cages situated several metres apart in a line. The birds in each hacking cage should be of the same sex. This is beneficial for future pairing behaviour, it avoids sibling aversion, and also removes bullying by larger females on smaller males. Additionally, an extra holding cage should be built on the

ground, near the caravan/hut, for temporarily housing any young that requires extra feeding or veterinary care.

The cages should be built in the following way. The dimensions of each cage are 12 feet (ca 4 metres) by 12 feet (ca 4 metres); the height is 8 feet (2.7 metres) and the frame may be constructed of steel or wood. Two cages can be built adjoining one another. The rear wall of the cages are completely wooded, using marine plywood, so that the birds cannot see people delivering food from the walkway at the back. All activities involving feeding the birds and caring for them prior to release takes place behind the cages. It is very important that the birds do not see people while they are in the cages.



Figure 3. Isle of Wight release pens from the rear.

The side walls of each cage should be similar plywood to the full height, so that birds in adjoining cages cannot see one another. This also allows birds in one cage to be caught for ringing, satellite-tagging etc., without the birds in other cages being disturbed in the process. Secondly, it replicates the wild situation, as there are almost certainly added advantages after release that the young in one brood meet and get to know new individuals as each new brood is released. Post-release there are clear hierarchies at the feeding platforms with the larger females dominant and the smallest males feeding last. This will be beneficial in the process of building relationships, and selecting potential mates, in the future. Studies in the wild show that it is very rare, or unknown, for siblings to breed together.

The front of the cage should be covered with weld mesh; either plastic coated steel mesh or strong plastic mesh, approximately one inch (2.5 cms) diameter. The mesh should be smaller rather than larger, to prevent damage to the young, especially to the cere or flight feathers, when they fly against it. The top of the cage should be covered in similar mesh, but the area over the artificial nest and the back of the cage should be covered with a strip of plywood about 4 feet (one+ metre) wide to provide shelter from heavy rain. But it is important that some rain can blow in on the birds so that they occasionally get wet, which is useful for cleaning and preening their plumage. Air flow through the cage also reduces the chances of aspergillosis, which White-tailed Eagles are susceptible to.

This cage system works best when two cages are operated together with a 'closed-lock' system between the two cages. In this set-up an external door opens into a small chamber 3 feet by 3 feet (one metre by one metre), with a door on two sides, each leading into an individual cage. When it is necessary to enter the cages, the operator opens the outside door, climbs into the small chamber then closes the outside door before opening the door into the individual cage to gain access. This system prevents escapes and the small chamber has another advantage, allowing a person standing there to check the birds, without being seen, through small holes drilled through the wood. Similar drilled holes in the back wall allow other views to check on the chicks and their feeding progress, although this has now been superseded by CCTV cameras in each cage.

In the back corner, opposite the door, a nest area is constructed. This should have retaining branches around the edge to demarcate it from the rest of the pen. It is best not to elevate this because doing so restricts access on and off the nest by smaller chicks. The nest itself should be a replica of the interior of a wild nest at the time when large chicks are present. Previously we have covered this in soft materials such as moss, straw, dried grass and leaf mould to create a flat platform on which the young birds can walk around and feed. However, these organic materials can harbour aspergillosis fungi, especially during periods of alternate wet and dry conditions. Aspergillosis is usually fatal if contracted, and White-tailed Eagles are particularly susceptible if they are immunosuppressed through stress. We now use rolls of

coconut/coir matting that can be easily purchased online. This is nailed to the bottom of the nest, and the rest of the pen floor, using carpet tacks. Artificial grass could also be used.

Just above this platform, make a hole in the back wall of the cage to put food in the nest. About 9 inches (22 cm) square, it has a lockable swing hatch on the outside, and on the inside is nailed a piece of material, or rubber matting (used as car foot mats), so that when the hatch is lifted, the person is not visible. Cut up pieces of food can be placed on plastic chopping boards to prevent it getting soiled. These boards can then be removed at the next feed and thoroughly cleaned. As the chicks become larger whole fish or larger chunks of food can be placed in the pens to encourage the birds to tear feed themselves.

At convenient places in the back wall of the cage, drill small holes which are convenient for watching the birds, without being seen. A miniature CCTV system should be installed in each cage to monitor the young – the new cameras scan most of the cage. This system is linked by cables back to a caravan or hut out of sight of the cages. A continuous recording of each brood is maintained for subsequent checking.



Figure 4. Newly-arrived chicks in the Isle of Wight cages, with the feeding hatch and food on a board behind.

Tree branches are nailed around the outer edge of the nest and a long branch, diameter 4 inches, is fixed from the nest to the far corner of the cage so that the young can branch when they are ready. Another branch crosses from side to side of the cage so that there is a network of perches for the birds to use. The floor of the cage is left open and free of vegetation, with two 12 inch (30 cm) diameter wooden blocks, 15 inches (38 cm) high. There should be no 45 degree supports within the cage to hold the roof; as birds can get wings caught in them. The front of the cage should have a large mesh door covering the top half of the wall, which can be opened outwards to release the birds. It should be locked until release day, and the system is unlocked during darkness on the night before release. A straight tree branch, ca 4 inch diameter, is wired to the top of the door to act as a perch as the eagles walk out. The door should be lowered slowly from the back of the cage using a long ropes attached to each side of the door, running through pulleys, without the birds seeing the person who is operating the cage opening. The door is lowered to the horizontal onto retaining posts. No one is allowed to walk round the front of the cages while the birds are in captivity and no attempt should be made to tame the birds in any way, or to habituate them to humans. The area around the cages should be kept as quiet as possible, including no noise or loud talking.

In front of the cages, construct two or three feeding platforms, ‘surrogate nests’. These are eight feet by eight feet (2.4 metres x 2.4 metres) wooden platforms fixed on four fence posts, five feet (1.5 metres) above ground to prevent foxes and badgers stealing the food.

At the Isle of Wight release site, three large oak trees were felled and then dragged out onto the field with heavy machinery and they provided excellent horizontal perches for the released eagles. When doing this work it is also worth ‘doctoring’ a few prominent big trees to provide open roost perches, which overlook the feeding platforms.

It is also useful to build an additional isolation/rehabilitation cage so that any injured or ill birds that require treatment can be cared for away from the other birds. It is important to site this away from the main cages in a convenient, easily accessible

location. If possible, the isolation cage should be the same size as the main cages with the potential to install partition walls if it is necessary to temporarily keep an injured bird in a smaller area. It is also helpful to install CCTV so that it can be monitored remotely in the same way as the main cages.

Collection and care of young

The collection of young must be carried out by experienced eagle field workers or ringers, who can recognise the health condition of individual young. A cohort of young should be collected from their nests in as short a time as possible, preferably over three to four days at a maximum, so that they are in temporary accommodation for the shortest time possible. They should be of the correct age, about two-thirds grown at about seven – eight weeks, so they are big enough to regulate their own body heat and mature enough to be able to pick up and eat food placed in front of them. Before collecting a bird check it thoroughly on the ground; it must have clear eyes, clean soft parts, smart plumage and must stand on the ground with balanced wings and legs. Only chicks in perfect condition should be taken: runts and birds with obvious problems, such as broken feathers, prominent fault bars, emaciated condition, or signs of any respiratory difficulties etc. should not be collected. Depending on the size of the young in any brood, either the oldest or youngest can be collected. During each season a balance of sexes should be collected. No eaglet collected by others should be accepted because it was not assessed by an expert before collection.

Each bird should be ringed and colour ringed, at the nest site, so that a record of its identification throughout the reintroduction can be maintained. Young can be carried from the eyrie in a normal large ringing holdall if taken down to a boat or vehicle; longer hikes require a large wicker basket mounted on a frame rucksack to safely transport the young. Place soft vegetation in bottom.



Figure 5. Chicks on a Scottish nest. The bird on the right was translocated to the Isle of Wight.



Figure 6. A wicker basket adapted to carry young eagles.

After collection, birds should be housed in an artificial nest situation in a secure shed or a building which has plenty of light from windows. Each bird should be weighed, measured and sexed. Temporary partitions, one metre high, can be nailed to create small nest areas for 2 or 3 eaglets. Recently we have used artificial grass or similar to line the floor, because aspergillus fungi, which White-tailed Eagles are susceptible to, occur in natural vegetation, and particularly hay. Pieces of wooden board like large wooden dinner plates are laid on the floor, so that cut up food can be placed in each

compartment without becoming unnecessarily soiled. The birds should be left alone with plenty of food (fish and meat) so that they can feed. Generally they will not eat if you watch them! Once one starts feeding, the others will follow. A screen of cloth or hessian is hung in front of the cages, with peepholes, to prevent imprinting and to observe the young, while food is provided under the skirt.

In 2024 individual eagles were collected by different teams and kept separately, at different locations, until such time that negative avian influenza results were received, as part of a HPAIV protocol agreed with APHA and NatureScot (Appendix 5).

In some cases, where a chick will not feed, the best thing to do is to cut the food into smaller pieces, small golf ball sized, and artificially feed it by holding the mouth open and placing the food in the back of the throat. Dipping it in water helps. Carry on until the crop is about the size of an orange or large apple.

Once the full collection of young is complete, the birds should be transferred to the release location as fast as possible. There are advantages in travelling at night; the transit van interior is cooler and the travel time shorter due to less road traffic. The eaglets are robust and travel well: even country to country by plane is not a problem. The best option is being able to travel with the birds, and in that case large cardboard boxes, with air holes, give the best travelling conditions. These boxes allow the birds to travel in darkness and they are then calm. On commercial aircraft, the travelling cages must adhere to flight regulations. Plastic flight cages for dogs are suitable, but lightweight and breathable sacking should be taped over the open mesh ends so that people are not visible. Birds need feeding before transport, with wet fresh fish, but do not need feed en route. Do not allow anyone at airports etc to handle the birds.

Once the birds have reached the release cages, each bird should be judged by someone with expertise and batched into broods of two of similar size, starting with the biggest, so that cages hold similar aged young. In this way, older birds can be released together and a cage or two of younger birds held back for a week or more until ready for release. With regard to future breeding, it is advantageous to separate sexes, into ‘female’ and ‘male sibling’ groups to prevent sibling aversion to future pairing. In the wild, raptors avoid mating with siblings.

The birds are placed in the nest with a large amount of food on the wooden feeding plates, which are placed around the edge of the nest so that each bird can feed. From then on, food is pushed through the feeding hatch, morning and evening. Food should be fresh and varied; fish, bird and mammal, and well cut up in pieces to encourage the young to fill their crops.



Figure 7. A young eagle prior to transit by light aircraft to the Isle of Wight. Note the cardboard boxes used for transport.

Maintaining a generous food supply is one of the biggest tasks for the team leader. Ideally should be obtained. It is important to cache food in deep freezers before the birds arrive so that there are no gaps in supply. Deep freezers need to be in a shed or similar with an electricity supply, plus running water. A heavy wooden table is needed for cutting up the food in to appropriate-sized pieces depending on age of young. Sharp butcher knives, a small axe for breaking bones, plastic containers for carrying food to cages, waste sacks etc. Frozen food needs to be defrosted before use. Remember to include bone in the food to build up calcium in the eagles. The young eagles require up to 1 kg of food each per day.

It is important that the birds are monitored carefully by watching the CCTVs and footage to check that each bird is feeding well in each cage. Very quickly they will all feed easily and then it is a matter of making certain they have plenty of food. It is impossible to over feed them and the aim is to be super-efficient parents by providing the young with as much food as possible. There is no need to reduce the food as the birds get near to fledging, but once their main growth of bones and body is complete, and the main flight feathers are fully grown, they will eat less food themselves. Body weight naturally declines just before fledging. As the young grow, larger pieces of food can be given to them as well as extra larger items, such as conger eel heads, to keep them busy and occupied.



Figure 8. The young eagles are monitored by CCTV while in the release pens.

Pre-release

After increasing amounts of wing flapping, the young will start to move out onto the perches, or perch on the wooden blocks, and then later fly from perch to perch. They may flap against the netting of the cage and this can look stressful. Do not worry too much that they will damage their feathers. After a couple of days they will quieten down

and then perch looking out of the cage watching everything that is going on. The reason for the small size of the hacking cages is to prevent the birds flying strongly and crashing at speed into the wire netting. Do not make the cages larger.

Ideally it is best to keep the young eagles about a week past normal fledging time before release. Do not delay the time of releases, because the eagles learn best when they are young, and will not venture too far from the immediate vicinity of the release site. On the day or so before release, the birds are caught up to be measured and weighed, satellite transmitters are fitted and they are checked to see that each is perfect for release. This is also the best time for a vet to health check them, to take blood and saliva samples, for veterinary checking and for subsequent DNA and sexing analyses.

The transmitters we use are Ornitela GPS/GMS 50 gm models manufactured by Ornitela in Lithuania. They are fitted using Teflon ribbon sewn in an X across the breast; the cotton thread is aimed to have a life of six years allowing the tag to drop off. These are excellent transmitters and the daily program of data collection and transfer can be varied through laptop communication. This is extremely valuable when searching for an individual on a specific date; with in field updates every fifteen minutes greatly aiding fieldwork. The one disadvantage is if the bird dies in a hidden location, in a gully or steep river valley, there may be no GSM coverage.



Figure 9. Satellite tags are fitted using a Teflon harness secured with cotton. Falconer's hoods keep the birds calm.

At this age, the eagles are very strong and can be dangerous if not held safely. This requires training and confidence, and many people will never feel comfortable with it. In order to carry out satellite transmitter attachment etc two competent ornithologists work together and must totally trust each other's abilities at controlling the eagles. It needs two competent people per eagle, with a third on hand to assist if required.

When the cage is entered the birds need to be caught quickly using large butterfly net made out of black-out material, which calms the bird. The bird needs to be held firmly across the wings and a falconer's hood is fitted over the head. We do not use heavy leather gloves as it removes the ability to work sensitively with each bird. The legs and talons must be held tightly and in 2021 the team used a new adaption where the feet and talons were fitted into small leather bags to prevent damage to people. A draw cord is fitted round one leg of each eaglet and clipped to the holder's belt so that the bird is secured when taken to the processing site. This removes any risk of the bird breaking free and flying off during the tagging. After processing the bird is returned to the cage with its 'sibling'.

A week before the release date start placing some food, at night, on the future feeding platforms in front of the cages so that birds in the cages get used to seeing other carrion feeders such as crows, magpies, and buzzards flying to and fro. Food is also placed on the solid parts of the roof of the cages. The catches on the door to be released are unlocked, the night before release.

Release techniques

The release requires a nice day, preferably with light winds or calm. Delay release if it is raining or there are strong winds. The cage fronts must be lowered gently over the pulleys by a person hiding behind and below the cage. As soon as the door reaches the horizontal level, tie off the release ropes before making a quick, silent retreat. Each bird makes its own decision to leave the confines of the release cage. In the past, and in some situations, observers should be on station at suitable viewpoints with a telescope and binoculars, so that a full record of each bird's behaviour is noted. Nowadays the release is better documented using cameras. There must be no one anywhere near the cages or visible close to them at this crucial stage. Cameras inside each compartment document activity within the cage, while a roof mounted camera, which can be remotely panned and zoomed, shows activity outside the cages. A second remotely operated camera on a post near the feeding platforms can be used to view the cages and follow released birds. The cameras can be linked with an App on a mobile phone. We use a Hikvision network video recorder and associated app to record and view the footage.

Birds may emerge quickly but often take an hour or more to fly for the first time. If a bird has not left by evening, the door should be pulled shut for the night to protect it from predators. Do not chase it out. The next day the release can continue. Once in the air birds may make extended flights or just fly for several minutes, or even, best of all, fly a short distance to land on the perches in the field, in nearby trees or a feeding platform. Birds will rarely re-enter cages, but will readily fly up on to the roof and return to eat food placed on top of the cages. Once the first released young are using the perches and feeding platforms subsequent releases are easier as the new ones copy the older ones' activities. For this reason, we recommend sequential releases.



Figure 10. The pen front is lowered using a system of ropes and pulleys so that it is completely silent and can be operated out of sight of the birds.

It is very important that the actual release can take place under each bird's own volition and that they are not scared out of or away from the cages. Ideally, they should still be living within the area around the cages during the first month, or more, and getting all of their food from the feeding platforms. In later years they may be joined in this activity by older individuals, which exhibit interest in the juveniles. This behaviour increases their knowledge of the local area and they become hefted to the area – knowing their local patch increases the likelihood of local breeding to create a new population. This learning behaviour is why the projects are successful.



Figure 11. Juveniles preparing for their first flight while another youngster watches on from a nearby perch.



Figure 12. Monitoring the release remotely using CCTV cameras ensures that the birds are not flushed.

Immediate post release

The most important activity post release is to have the young birds coming to a regular food supply. Young White-tailed Eagles are provided with food by their parents for several months or more in the wild. In a reintroduction project, the longer the birds stay around the release site and receive plentiful food at the feeding platforms, the greater the survival rate in the first autumn and winter of life. Birds which fail to stay close to the release site or get frightened away in the first few days are more likely to have problems finding sufficient food. Remember, even in the wild most mortality occurs in the first year. Translocated birds are exceptionally valuable to a project so every effort must be made to increase survival in every way possible.

After release, food should be deposited on the feeding platforms during the hours of darkness to avoid frightening them. Food should not be placed on the ground because it is then subject to consumption by ground predators, such as red fox and badger. Large flat rocks, each the size of a kitchen table, can be ideal for placing food, as at Loch Maree, but it is best to build feeding platforms in the middle of the open feeding area. Made from wood, 6 feet by 6 feet (2 metres by 2 metres) and more than four feet (1.5 metres) high, covered with an old carpet or artificial grass material, this keeps the

food off the ground. The birds will fly to these places to feed or take chunks of food back into the trees to feed. Three platforms allow the shyer birds to come and feed. There are clear hierarchies with larger females feeding first and the smallest males last.

This is the time to put out as much food as you can supply. Each bird requires up to one kilogram per day. Rabbits, fish and fish off-cuts, dead deer, dead birds, offal, road kills are all important food. Initially it is best to continue putting out food at night, but later once the birds really know the feeding area, it is ideal if you can drive to the feeding site and take food out of the vehicle, which causes less disturbance than delivery by foot. Eagles generally feed in the early morning and late afternoon. Later in the winter it is possible to reduce feeding to every other day or sometimes more, but just put out more carrion on each visit, to ensure there is always food available when a bird wishes to feed.



Figure 13. Four juveniles using a single feeding platform after release.

Remember the longer the birds stay at these feeding sites, the greater their survival. Young sea eagles will certainly locate their own food but the feeding site is very important. You will not make the birds lazy or lacking in ability. Sea eagles are social birds and are used to living in small flocks, and there are almost certainly advantages at these gatherings to gain social skills and to choose future partners. The feeding

area should be maintained throughout the whole winter up until March or April when one will notice a decline of use.

Post release tracking

The satellite transmitters are now a very effective means of following the eagles; data is collected each evening, analysed and saved. This requires handling of large amounts of data and efficient reporting systems. When birds end up in new localities, and settle, we make contact with the local landowners to give them information and ask for any interesting observations. These people love to see the maps of the bird's travels. We also contact the county bird recorders but we do not make the map data readily available to the general public in order to minimize disturbance to the eagles, especially from long-lens photographers, and to maintain good relations with local farmers, foresters and land owners. Monthly summaries of the eagles' travels are shown on our website but do not identify any locality which might have the potential to be a future nesting site.

The Ornitela online portal can be easily accessed in the field, which is helpful for locating tagged birds.

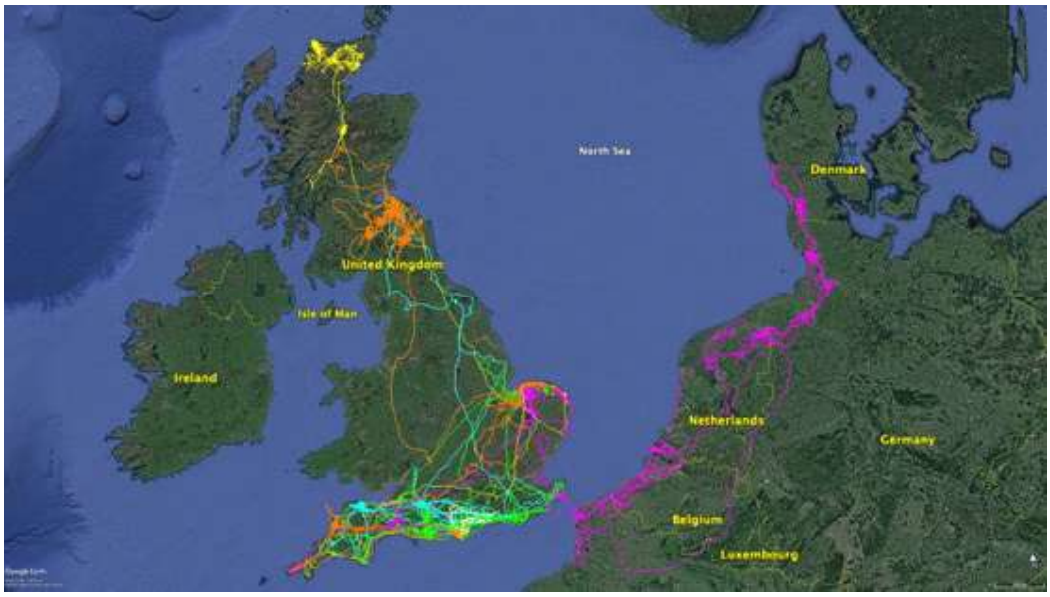


Figure 14. Post-release movements of White-tailed Eagles released on Isle of Wight in 2020.

Future Management

As the eagles mature any signs of settling into a home range is noted, especially if it involves the formation of a pair. Decisions are required with regard to land ownership, safety of the site with regard to human disturbance and maintaining a watching brief. In some circumstances the building of human-made eyries should be explored because White-tailed Eagles will take over used nests. In fact many first time breeders use nests built by previous occupants. The advantages are to build big secure nests that may encourage earlier successful breeding. Other ways of increasing the rate of recovery is to translocate younger-aged eaglets from the donor population into nests if the eggs do not hatch; and to increase brood size to three young, by similar translocation, if only one egg is hatched. Remember an eaglet reared in this way is preferable to one reared in a hacking cage; and it is possible to have a food dump near a manipulated nest. Everything is geared towards enhancing the breeding success and production of flying young in the early years.

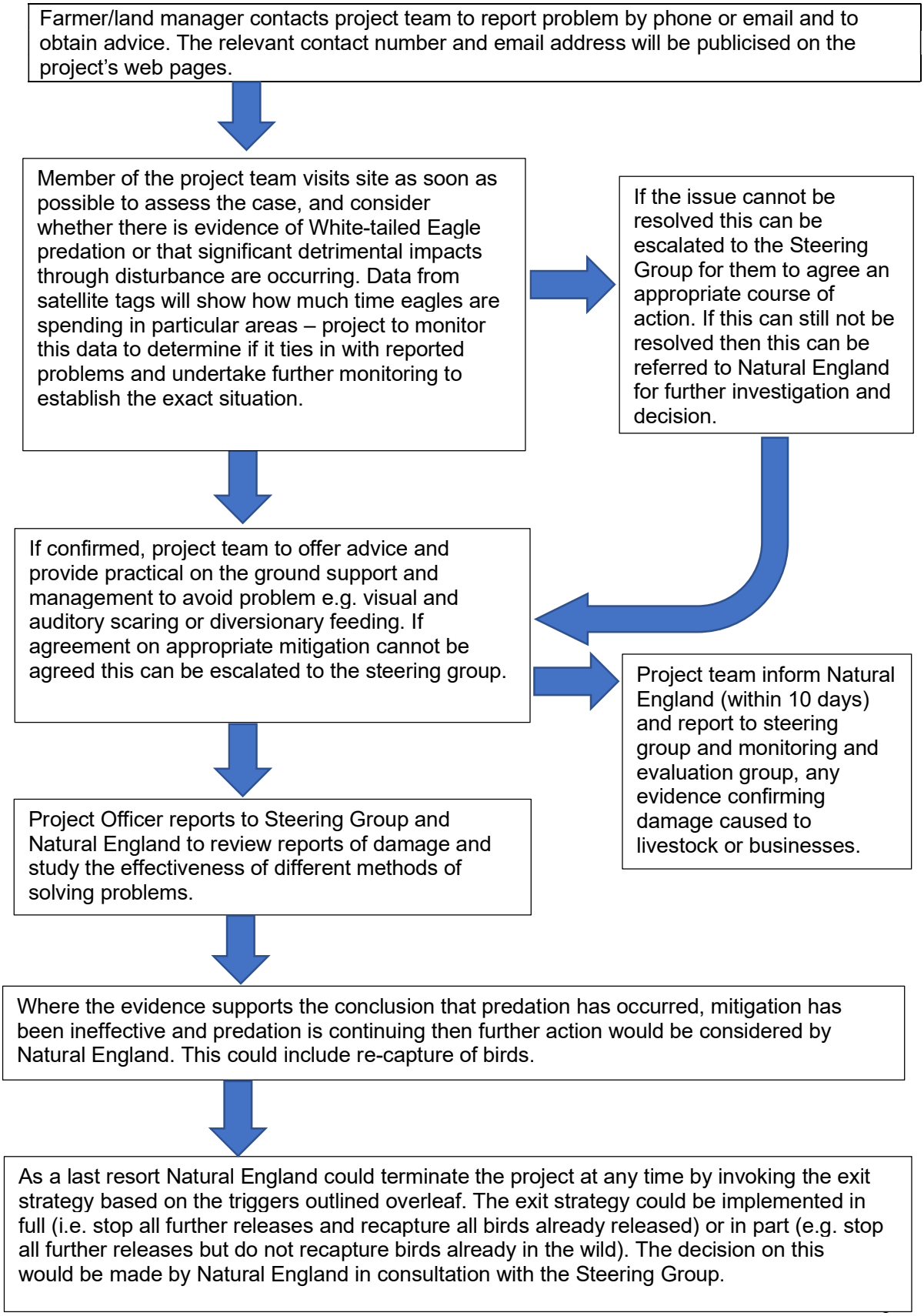
Conclusion

Key points:

- Careful consideration should be given to the release site. This should be completely undisturbed with an open area surrounded by mature trees with ample easy perching opportunities and space for elevated feeding platforms.
- Only the strongest, healthiest young should be translocated.
- Young should be kept in ‘broods’ of two of the same sex.
- The birds should have no human contact during the pre-release phase, other than to satellite tag them prior to release.
- Food – a mixture of fresh fish, rabbits, rats, birds and meat from deer - should be placed in the cages at least twice daily, through a hatch in the solid rear wall. Small chunks should be used first, with larger pieces introduced as the birds become older.

- The young eagles should be monitored remotely by CCTV both pre and post release.
- On release day the front door of the cages should be lowered silently using a system of ropes and pulleys. It is important that the birds fly at their own accord and are not flushed.
- Food should be placed on elevated feeding platforms after release. This should be done at night to ensure the birds are not disturbed and do not associate humans with food.
- GSM satellite transmitters manufactured by Ornitela provide an excellent method for post-release monitoring, with the advantage of being able to change the data collection and transmission schedules remotely. This is very helpful for field monitoring.

Appendix 2- White-tailed Eagle Project- Reporting procedure for farming, fishing and shooting interests



Exit Strategy Triggers

A key role of the project Steering Group will be to objectively assess the project against the exit strategy triggers on an annual basis on receipt of the annual monitoring and evaluation report in April of each year. The exit strategy would be implemented in the event that:

- Unsustainable and detrimental effects arise as a result of the re-introduction of White-tailed Eagles;
- Any significant change occurs to the required funding or management structure of the project that threatens the project viability;
- There is unacceptable risk to human health, wildlife or farming/fishing/shooting interests;
- There is an unsupportable level of mortality in released animals as a result of persecution, human intervention, or natural mortality attributable to the project;

The project Steering Group may also be required to meet on an extraordinary basis if exit is triggered by a significant event, or combination of events, outside of the planned meeting schedule.

Appendix 3 – Public Questionnaire

EXMOOR NATIONAL PARK

White-tailed Eagle Public Perception Survey

Exmoor National Park Authority is working to support the White-tailed Sea Eagle reintroduction programme in southern England, which is led by Roy Dennis Wildlife Foundation (RDWF) and Forestry England. Exmoor has become a hotspot for White-tailed Eagles (also know as Sea Eagles) since the project began with seven different birds visiting, spending time along the coast and in the combes across the moor. We now hope to reinforce the establishing population with a small- scale release of juvenile White-tailed Eagles on Exmoor. The Exmoor coast with its large areas of woodland provides perfect breeding habitat for the birds, which prefer to eat fish when they are rearing young. The project would involve the release of up to 20 birds over a three-year period, and we would like to know people's thoughts on this. We would be grateful if you could spend 5 minutes to complete this anonymous questionnaire.

Data Protection: Any data collected from this online survey is completely anonymous. No personal data will be collected, stored, or processed. All responses are confidential and will be used solely for the purposes of this survey.

This survey will close on Friday 31 January 2025.

A few facts about White-tailed Eagles (*Haliaeetus albicilla*).

- They are a large bird of prey which nest in trees near coastlines, estuaries and freshwater wetlands. They are the largest UK bird of prey with a wingspan of up to 2.5 metres.
- They feed primarily on fish and water birds but are opportunistic and will also feed on mammals like rabbit and hare, and carrion (dead animals).
- They range huge distances for their first few years before securing a breeding territory and mate. They will return to their natal nest or close by (60km) to breed around the age of five years.
- They usually rear one or two chicks a year.
- Since 2019, 37 white-tailed eagles have been released on the Isle of Wight.
- They have now become an established part of the landscape after an absence of over 240 years.

* Required

1. Did you know what a White-tailed Eagle was before completing this survey? *

◯ Yes ◯ No

2. Do you think White-tailed Eagles are native to Exmoor? *

Native means they have naturally occurred here in the past.

◯ Yes ◯ No

◯ Don't know

3. How much do you agree or disagree with the following statement? *

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I would support a reinforcement of the White-tailed Eagle population in southern England through a release on Exmoor.	◯	◯	◯	◯	◯

4. If you would like to explain your answer above, please do so here.

5. Do you live in Exmoor National Park? *

◯ Yes

◯ No

6. If no, which county do you live in?

7. Do you visit Exmoor National Park? *

◯ Yes

◯ No

8. Do you, or have you worked on Exmoor? *

◯ Yes

◯ No

9. If yes, what industry or sector do you work in?

10. Are you interested in any of the following activities?

- [ ] Birdwatching
- [ ] Cycling
- [ ] Fishing
- [ ] Horse riding
- [ ] Hunting and shooting
- [ ] Walking and hiking
- [ ] Water sports
- [ ] Other

11. Where did you hear about our White-tailed Eagle survey?

- [ ] Project talk/event
- [ ] ENPA website/mailing
- [ ] Radio/newspaper
- [ ] Social media
- [ ] Word of mouth
- [ ] Other

12. If you have any further comments please feel free to write them here.

Thank you for completing our survey.

This content is neither created nor endorsed by Microsoft. The data you submit will be sent to the form owner.

Microsoft Forms

Appendix 4 – Public meeting promotion/information



EXMOOR WHITE-TAILED EAGLE PROJECT

Information Events and Family Activities

Join experts from Roy Dennis Wildlife Foundation, Forestry England and Exmoor National Park to find out more about a possible release of White-tailed Eagles on Exmoor to support the ongoing recovery of this iconic species in southern England.

Friday 22 November	Saturday 23 November
5pm-8pm	11am-2pm
National Park Centre, Dunster	National Park Centre, Lynmouth
The Steep, TA24 6SE	The Pavilion, The Esplanade, EX35 6EQ.

Please fill out our Public Perception Survey using the QR code.

www.exmoor-nationalpark.gov.uk



EXMOOR WHITE-TAILED EAGLE PROJECT

A few facts about White-tailed Eagles (*Haliaeetus albicilla*)

- Largest UK bird of prey with a wingspan of up to 2.5 metres which nest in trees near coastlines, estuaries and freshwater wetlands.
- Feed primarily on fish and water birds but are opportunistic and will also feed on mammals like rabbit and hare, and carrion (dead animals).
- Range huge distances for their first few years before securing a breeding territory and mate.
- Return to their natal nest or close by (60km) to breed around the age of five years and usually rear 1-2 chicks a year.
- Since 2019, 37 white-tailed eagles have been released on the Isle of Wight and have now become an established part of the landscape after an absence of over 240 years.
- Exmoor has become a hotspot for White-tailed Eagles (also known as Sea Eagles) since the project began with 7 different birds visiting, spending time along the coast and in the combes across the moor.

For further information on the Exmoor White-tailed Eagle Project contact:
Zoe Smith seaeagles@roydennis.org or **seaeagle@exmoor-nationalpark.gov.uk**

EXMOOR NATIONAL PARK

WILDLIFE FOUNDATION

Forestry England

Appendix 5 – White-tailed Eagle HPAIV protocol for Isle of Wight project

White-tailed Eagle Project biosecurity protocol- HPAIV mitigation

1. Introduction

The Isle of Wight White-tailed Eagle Project aims to restore a breeding population of the species in southern England after an absence of 240 years. The project, which is licensed by NatureScot and Natural England, involves the collection of wild White-tailed Eagle nestlings aged approximately five-seven weeks from nests in Scotland. These birds are then translocated to the Isle of Wight where they are kept in large release pens for a period of six-eight weeks before release. During this period human contact is kept to an absolute minimum. The project reached a significant milestone in 2023 when a pair of translocated eagles successfully reared a chick for the first time at a confidential location in West Sussex. In addition, three other territorial pairs are now established.

The initial licence issued by NatureScot permitted the collection of up to 60 White-tailed Eagle chicks between 2019-2023. Difficulties associated initially with the Covid-19 pandemic and, more recently, due to avian influenza mean that it has only been possible to translocate 31 birds to the Isle of Wight, rather than the 60 covered by the licence. The initial licence has now expired but a request for a three-year extension has been made, to enable the remaining 29 birds to be translocated.

It is deeply regrettable that six White-tailed Eagles that had been collected for translocation to the Isle of Wight were euthanised in 2023 after three individuals tested positive for Highly Pathogenic Avian Influenza Virus (HPAIV). This protocol has been devised following experiences in 2023 and aims to ensure that if HPAIV is detected in a single White-tailed Eagle that no other birds are euthanised as a result.

2. Overview of plan

The key aim of this protocol is to ensure that each individual White-tailed Eagle collected for translocation to England remains separate from any others until such time that negative HPAIV tests are received. There will be no cross-over of personnel collecting or caring for individual eagles from the point of collection onwards. All staff will be trained in biosecurity procedures, and the number of responsible staff kept as low as reasonably possible in order to ensure correct adherence to procedures. Staff in contact with White-tailed Eagles at will not have been in contact with captive birds of any sort for the preceding 72 hours.

3. Chick collection

A group of personnel will each collect a single White-tailed Eagle from a nest. They will remain completely dedicated to this individual White-tailed Eagle and will not have any contact with any other chicks collected at the same time. Chicks will be collected between approximately five-seven weeks of age from monitored nests. Only chicks that appear to be healthy will be collected, and only from nests in which at least one other healthy chick can be left behind. On collection, White-tailed Eagles will be immediately placed into transport crates (labelled with the ring numbers of each chick). These transport crates will be dedicated to the individual White-tailed Eagle and will not have been used to transport other birds within the past 11 months. They will have been thoroughly cleaned and disinfected prior to use, with a DEFRA approved disinfectant (Appendix 1).

All personnel involved in chick collection will wear clean and disinfected boots and clothing. After use, boots will be thoroughly cleaned and disinfected. Brand-new, disposable Tyvek overalls will be worn by personnel involved in White-tailed Eagle collection. These Tyvek overalls will be disposed of after use. For the handling of White-tailed Eagles and any equipment associated with the translocation, an alcohol-based hand sanitizer (see Appendix I) will be used before the placement of disposable gloves. All equipment to be used in the capture and transport of White-tailed Eagles will either be disposable or will have been cleaned and disinfected prior to use using a DEFRA approved disinfectant (Appendix 1). Gloves should be changed, hands disinfected, and any equipment used will be disinfected between each nest visit.

4. Collection of swabs for HPAIV PCR diagnostic tests

On collection from the nest, each of the White-tailed Eagles will be ringed for identification. At this point they will also be swabbed for HPAIV PCR (one cloacal and one oropharyngeal swab). The personnel undertaking swabbing will have had appropriate training and will have been approved as capable swabbers by the project veterinary surgeon.

Swabs will be taken using aseptic technique, ensuring the outer packaging of the swab remains uncontaminated. Swabs will be sent separately to APHA in Weybridge for fast-track analysis.

It is intended that four separate teams will collect four individual White-tailed Eagles over the same time period.

5. Transportation to the biosecure holding area

After collection White-tailed Eagle nestlings will be transported, within their transport crates, to individual holding pens at separate locations within a dedicated vehicle in which other birds (alive or dead) have not been transported within 72 hours. There will be a separate vehicle for each individual White-tailed Eagle.

There will be a clean and dirty area within each vehicle. The clean area will be the front of the vehicle where the driver and any passengers sit. The dirty area will be the boot/rear of the vehicle where the eagle crates will be transported. Any contaminated boots/clothing/gloves will be transported in the dirty area after use.

On arrival at the holding site, the carriers will be transported across the biosecurity barrier following the protocol in section 8. Once within the biosecure holding area, the White-tailed Eagle will be removed from its carrier and placed into the pen. The transport carriers will be disinfected (Appendix 1) and will remain within the biosecurity barrier. Likewise, the vehicle will be cleaned and disinfected using a Defra approved disinfectant after use.

6. Location of each biosecure holding site

Each White-tailed Eagle will be kept at a different location in northern Scotland. Each bird will be taken to the closest available holding site after collection. These sites are located across northern Scotland, including two sites on Harris and Lewis, and four sites in mainland Scotland.

There can be significant temporal differences in nesting initiation between White-tailed Eagle breeding pairs, even in the same geographical area. As such it is hoped that it will be possible to collect two or three cohorts of three-four White-tailed Eagles during June, with at least 72 hours before departure of one cohort and the collection of the next. Holding pens will be reused if individuals previously collected have tested negative for HPAIV. No more than 12 White-tailed Eagles will be translocated to the Isle of Wight in a single year.

7. Husbandry measures

A dedicated person will place food within the holding pen twice daily, and check the condition of the bird visually. This food will be pre-prepared and kept in a dedicated freezer at each site. When required food will be removed from the freezer and placed in a dedicated cool-box within the biosecure area to defrost. It will then be placed in the pen through the feeding hatch. No uneaten food will be removed from within the pen.

8. Biosecurity at each site

At each site there will be a single pen holding a single White-tailed Eagle. In each case the pen will be sited within an outbuilding/shed with a biosecure barrier at a single entry point. The pen will be raised approximately 0.75m off the ground to prevent access by rodents. The pens will have a solid rear wall, and a solid roof. There will be a small

lockable feeding hatch in the rear wall. The front of each pen, and half of each side wall will be made of plastic-coated steel wire mesh to allow natural light and ventilation. The solid walls will be made using plastic coated plywood so that they can be effectively cleaned and disinfected after use. A diagram of the holding pen design is shown in Figure 1.

The pens will be lined with artificial grass and/or natural material (eg rushes) collected 60 days in advance and then exposed to UV light/sunlight. No material with visible contamination from faeces or feathers will be collected.

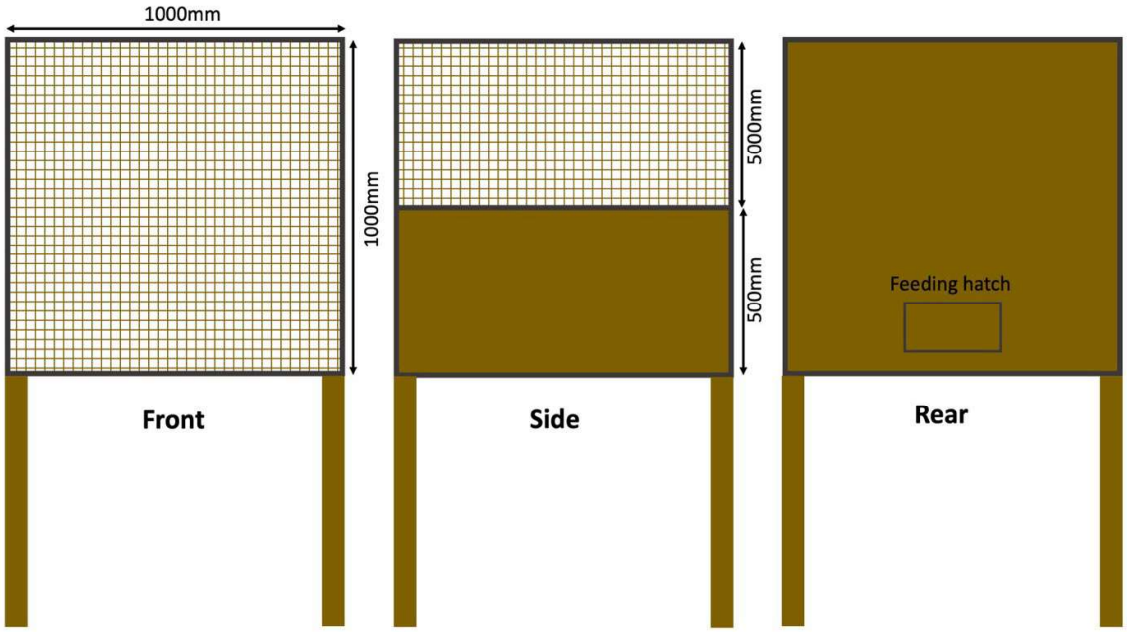


Figure 1. Diagram of the White-tailed Eagle holding pen that will be used at each site

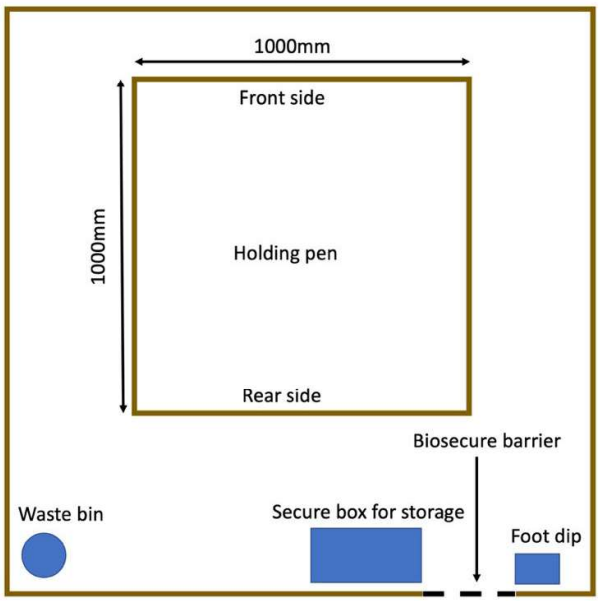


Figure 2. Site plan of each White-tailed Eagle holding pen within the biosecure area

A site plan of each holding area is presented in Figure 2. In each case the holding pen will be sited within an outbuilding/shed with a single entry point. There will be a biosecure barrier at the entry point through which all personnel and equipment will travel. The entrance point will consist of:

- Overalls and rubber boots sealed within a secure, lidded plastic box – all personnel entering the biosecure holding area will remove their footwear and put on the dedicated boots and overalls.
- Disposable gloves within the secure, lidded plastic box – these will be put on as the barrier is crossed and removed, using aseptic technique, when leaving the biosecure holding area.
- A lidded foot dip containing an appropriate DEFRA-approved disinfectant (Appendix 1) to a 20 cm depth to ensure boots are adequately covered. Disinfectant solution is inactivated by organic matter and the foot dip solution will therefore be changed as soon as it becomes visibly contaminated or discoloured. A water bucket with a hoof-pick and brush will be placed at thebiosecurity point to allow personnel to clean boots before applying disinfectant.
- A secured, lidded clinical waste bin for used overalls/gloves. See section 9 for more information on waste.

Dedicated equipment will be used within each biosecure holding area, for example food containers and buckets. No equipment will cross the biosecurity barrier and leave the biosecure holding area.

After use all solid waste will be removed from the pen. The pen and the shed will then be washed with detergent, and disinfected once the pen/shed has had a chance to dry

off. It will be important to follow Defra/manufacturers gudielines regarding minimum contact time for the disinfectant.

9. Waste disposal

Any waste will be placed into a yellow clinical waste bag within a secured, solid bin within the biosecure holding area. When full, the clinical waste bag will be secured with a cable tie and double bagged. Used bags will be held within a secure bin within the biosecurity barrier.

10. Management staff

There will be no cross-over of personnel caring for individual White-tailed Eagles during the collection period. A dedicated person will place food within pens and perform husbandry tasks day to day. Nobody who has had contact with any other captive birds within 72 hours (including the other White-tailed Eagles) will cross the biosecure barrier to enter the biosecure holding area.

11. Veterinary examinations

During the collection period, in the event that a White-tailed Eagle is sick, a wildlife veterinarian will attend the site. This veterinarian will not have had contact with other captive birds (including the other White-tailed Eagles) for 72h prior. In the event that this is not possible, the veterinary surgeon will shower before attending the site, and wear clean clothes. They will change into dedicated overalls and boots at the biosecure barrier, disinfect their hands and place clean gloves. They will also place a face mask and hair cover, and wear protective goggles.

During veterinary examinations, or handling of White-tailed Eagles by other personnel, disposable gloves will be worn. After handling, hands will be washed thoroughly and disinfected using an alcohol-based sanitiser. No equipment used for examinations will leave the biosecure holding area.

12. Vehicles

There will be no cross-over of vehicles between epigroups of White-tailed Eagles. Personnel working with different epigroups will not share a vehicle at any point during the collection period.

13. Translocation to the Isle of Wight

The White-tailed Eagles will be translocated to the Isle of Wight only after receipt of a negative HPAIV test. Collection and testing will be synchronised so that 3-4 birds can be translocated together, and to ensure that the birds are kept in the holding pens for the shortest possible period. The birds will be transported to the Isle of Wight by private plane in individual travelling crates. If any birds test positive for Avian Influenza they

will not be translocated and the bird will be left in the holding pen until further instructions from APHA.

Appendix 1 – Recommended disinfectants (note that this list will be checked immediately prior to eagle collection to ensure it is up to date with current guidelines)

For equipment, boots, feeding utensils

One of following disinfectants are recommended, given that it is DEFRA approved for use against HPAIV:

- Virkon® S tablets at one 5g tablet in 350mls water or Virkon Professional tablets at one 5g water in 400ml water
- Safe4 Apple 10:1 dilution

For disinfecting human skin

- Hibiscrub® (active ingredient chlorhexidine gluconate - 4% w/v chlorhexidine gluconate in an aqueous base).
- STERILLIUM® Gel, an alcohol-based rub-in product (highly efficient formula with 85% ethanol).

When using all disinfectants, it is important to remove dirt/debris first because organic matter renders disinfectants ineffective. For example: boots should be scrubbed to remove organic matter (e.g. soil) and then disinfected with a F10 spray disinfectant. All products should be allowed to dry after contact time complete.