

CUMBRIAN WHITE-TAILED EAGLE PROJECT

Habitat suitability assessment



A summary of the original technical report by Prof Steve Carver and Edward Carver, "*Habitat suitability assessment for establishing a white-tailed eagle population in Cumbria*".

Context

White-tailed eagles (*Haliaeetus albicilla*) have been absent as a breeding species from Cumbria for more than two centuries. Despite the long, wandering flights made by white-tailed eagles from elsewhere in Britain, which sometimes take them across Cumbria, they do not settle here because they tend to return to their natal ('childhood') area to breed. Seeing this species living in Cumbria once again requires a dedicated reintroduction of the birds in Cumbria. Before a reintroduction can be seriously considered, it is essential to understand whether the habitat here is suitable for them.

Methods

To understand if the habitat in Cumbria is suitable for white-tailed eagles, we combined several highly detailed digital maps of the geography of the region to see how suitable places were for eagle nesting and foraging for wild prey. We also assessed where there were areas that might be a hazard for eagles, and would therefore be less suitable, such as wind farms.

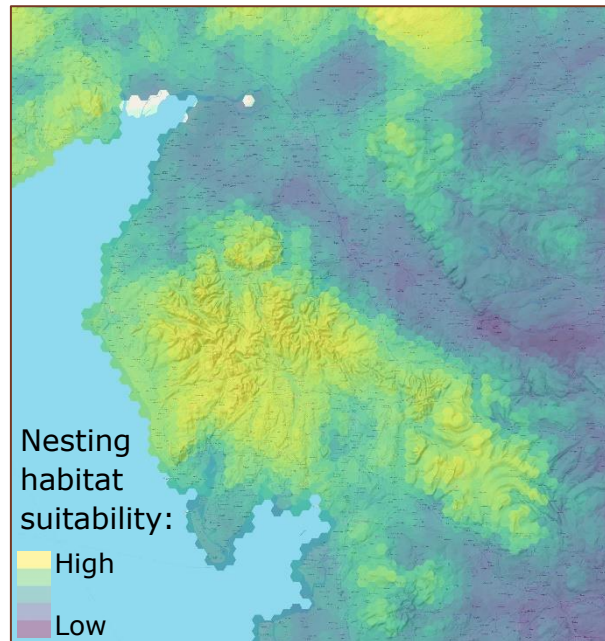
By combining this information into one map in a Geographic Information System (GIS), we can make more informed choices about whether and where reintroducing white-tailed eagles to Cumbria would be ecologically feasible (i.e. deciding if the natural environment here could support a healthy population of these eagles in future, provided people want them back).

We have drawn on the knowledge from studies of existing populations of white-tailed eagles in Britain and Ireland, and the experience of habitat suitability assessments that have been carried out for other regions. For example, we can learn from where white-tailed eagles live currently to understand where they like to build their nests and where they tend to visit to find food. We can also incorporate knowledge from the computer models of Scottish white-tailed eagles'

behaviour to better account for things like how high up the eagles like to nest, how steep the land is, and how close their nests are to water and trees.

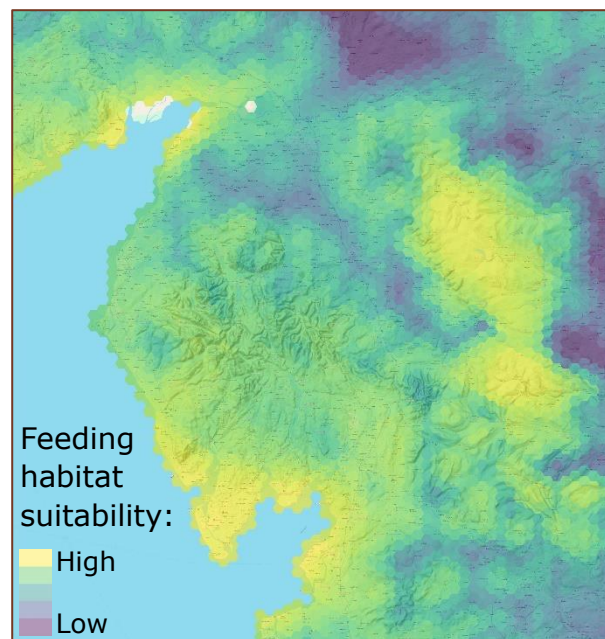
Mapping nesting habitat

White-tailed eagles typically choose nesting sites in large trees or on cliffs. We predicted suitable locations for nests based on previous eagle sightings and the presence of suitable habitats such as cliffs and mature trees. These predictions were refined using computer models to identify the best nesting areas considering factors like terrain and elevation.



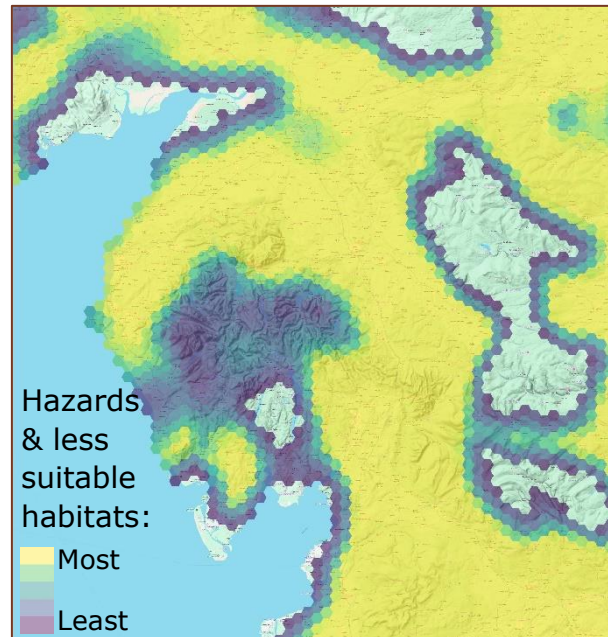
Mapping feeding habitat

Once suitable nesting areas were identified, we then identified areas within a 6-10km radius of potential nest sites where the eagles' main prey (fish and waterbirds) would likely be abundant. For example, we considered proximity to water bodies where the eagles would be able find these prey, as well as other suitable habitat types like wetland. We were then able to pinpoint areas where white-tailed eagles would be likely to find ample food sources to feed themselves and their young.



Mapping hazards & less suitable habitats

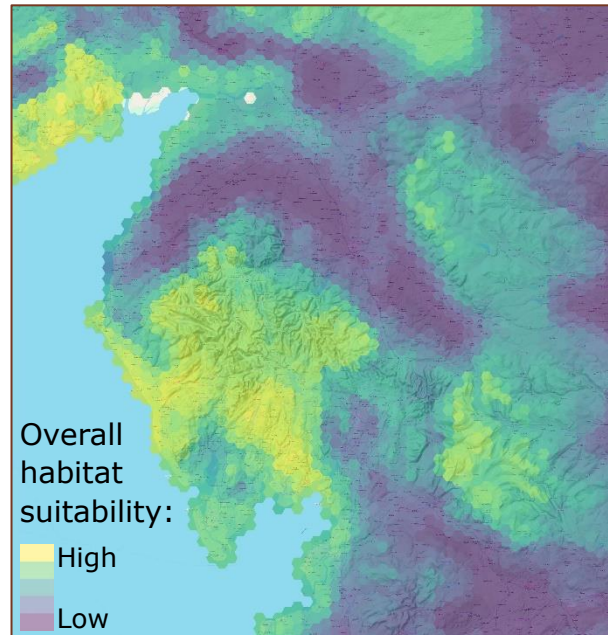
Finally, we also identified areas that would be hazardous or less suitable for white-tailed eagles. We mapped factors like the presence of large structures such as wind turbines which could pose collision hazards to flying eagles. We also identified areas of relatively high sheep density which would potentially be unsuitable for nesting eagles, as well as land uses or habitats that are less suitable such as urban areas and open moorland. By mapping data on these factors, we have been able to better understand where the less suitable areas for eagles in Cumbria are.



Combined results

The results from this mapping reveal that there are some promising areas for white-tailed eagles in the central-southern Lake District National Park, as well as along the southern coast around Morecambe Bay and the northern Solway coast. These are places where reintroduced white-tailed eagles might be able to thrive.

We have also run tests to see how reliable our models are, taking into account a level of uncertainty in how specific the predictions can be. By doing these tests we know that the predictions of feeding grounds and areas with hazards or unsuitable habitat are robust. However, the predictions of nesting areas are more sensitive to local factors like subtle variations in land types and land use, or the steepness of a site, which combined can be harder to predict consistently and accurately.





Conclusions

These findings lead us to conclude that the areas around the lakes and the estuaries in the southern portion of Cumbria might be good places to reintroduce white-tailed eagles. These areas seem to have suitable food, nesting areas, and fewer hazards for white-tailed eagles, giving any released birds the best chance of establishing a Cumbrian white-tailed eagle population.