

Editorial

The Impact of AI Generated & Edited Images on Birdwatching

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Introduction

Artificial intelligence (AI) has 'overrun' the world in recent years. Much of society now relies on AI - whether it be to summarise a document, write an article, do school homework assignments, crunch data or generate an image. AI has not left the birding world unscathed. Many individuals use AI applications for image processing. Image editing has always been a subject of controversy, from the days of Photoshop. Now with AI applications it has become increasingly easy to edit an image of a bird, at times unethically. AI is also revolutionising wildlife conservation by enhancing species monitoring and protection, aiding habitat preservation and management thereof. We discuss here some of the benefits and challenges of using artificial intelligence and its impact on birdwatching, bird photography and citizen science (data) for birds

Positive applications of AI for Birdwatching and Conservation

AI technology can be a valuable tool for legitimate ornithology and birdwatching (Plate 1) (Quantzig 2025; Chisom *et al.* 2024).

AI technology enables the analysis of large datasets, like eBird, and this can aid conservation by mapping trends in species numbers in different regions. It can also predict the impacts of climate change or human activity on bird populations. Threat Assessment Matrix using AI technology allows analysis of data on human activities such as agriculture and urbanisation to assess potential threats to habitats which guides conservation strategies to mitigate these threats. This enables more efficient advocacy for and the allocation of resources to protect threatened species and habitats.

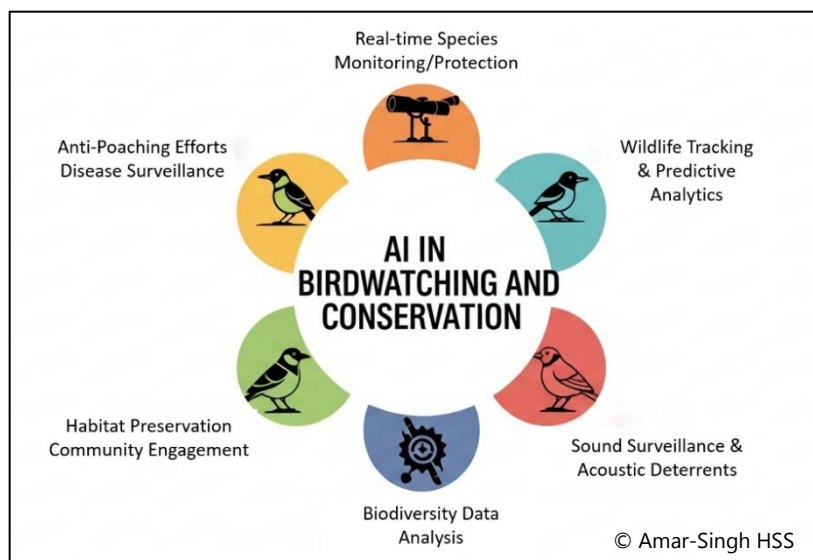


Plate 1: Some uses of AI for Birdwatching and Conservation

Researchers can use AI-controlled cameras and acoustic recorders for the automated monitoring of birds 24/7 (Plate 2). The systems can process thousands of hours of audio and visual data to identify species, track population trends including population estimation and detect changes in behaviour. AI can also potentially assist the average birder to sort vast image datasets that many have (using techniques like unsupervised learning and zero-shot retrieval), to identify specific images and group bird images into species folders.



Plate 2: AI in the use of monitoring bird species.

AI can be a valuable tool for anti-poaching efforts. Drones equipped with AI can patrol large areas and detect unusual human activity especially for protected areas and saving endangered bird species. AI driven predictive analysis can thus forecast potential poaching hotspots.

AI bird applications also offer identification tools based on an image or sound recording that can help even experienced birdwatchers identify species. AI technology incorporating cameras and software into binoculars provides birders with instant taking of photographs while simultaneously watching the bird and its behaviour as well as an aid to ID birds in real time.

Threats of AI Generated and Edited Images to Birdwatching

AI generated and edited images can pose a significant threat to birdwatching, primarily by introducing misinformation that corrupts reliable data as well as creating unrealistic wildlife depictions that can distort public perception and foster a detachment from nature.

AI developers and users might infringe copyright if generative AI produces outputs that are substantially similar to original works. While AI images can be visually compelling they may lack the personal narrative, lack emotional depth, and unique artistic vision of photographers as well as authenticity that human generated images often possess.

The rapid expansion of AI and its associated resource demands can put a strain on natural ecosystems potentially jeopardising birdlife habitats.

Some birdwatchers and photographers are now using AI to manipulate photos to a degree far beyond traditional editing, for example, removing objects, adding details that were never there or bringing birds together or in greater numbers (Narayanswamy 2025). This has always been possible with traditional image editors but it took a lot of effort. Now it has become much easier and more realistic, making discerning what is real harder.

Plate 3 illustrates an example. An AI image application was trained with prompts to use two images of the Bornean Peacock-Pheasant *Polyplectron schleiermacheri* to create a new image with the birds facing each to suggest courtship. Note the seamless background and ground environment of the image. This may easily fool many of us. Note however, that the bird sizes are not accurate, the Bornean Peacock-Pheasant male (50cm) is much larger than the female (35cm). In addition, subtle changes have occurred, for example the male bird has lost the leg spurs. But it does illustrate how far AI image editors have come. In the very near future AI applications will generate images that the best of us will not be able to distinguish from the real ones.



Plate 3: Two real images (left) of the Bornean Peacock-Pheasant manipulated with AI image editing to suggest courtship (right).

Platforms like eBird rely on user-submitted photos for species distribution and population monitoring. There is concern that birds not present in a region might be AI generated or edited to look like they were seen in that part of the country. If these fake AI images are included, they can degrade the credibility of citizen science and undermine conservation efforts. In addition, it increases tourist pressure on natural areas with undesirable effects. Consequently, posting these fake images on locations where a particular species do not exist can exacerbate overtourism and its detrimental effects on ecosystems. Plate 4 illustrates an example. Random, real images of the Asian Green Bee-eater *Merops orientalis* were taken and the AI image application was trained with prompts to generate a species authentic image. This can then be posted as observed in Malaysian as the observation of a rare bird.

In bird groups, images are at times posted with an incorrect species identity (ID) that was possibly obtained using AI detection - suggesting a bird ID not found in Malaysia because of inexperience. Using AI to determine the ID of a bird can be useful for beginners but in the long run it can deteriorate your bird watching skill. It is better to consider the more long-term, rewarding method of reading up on a bird to determine its identification. This will grow your skills on other birds while you're searching the ID of this bird (Pankiv & Kloetze 2024).



Plate 4: A new image of an Asian Green Bee-eater generated with an AI image model.

We have all seen the outlandish images of videos of birds circulating on social media that we as birdwatchers know do not exist in our world. But the general public is less aware and often send them to us to say something like "*have you seen these wonderful birds in Malaysia?*". Many are viraled on social media and are shared by users who believe they are real. AI fabricated, fantasy species images can distort the public's perception of nature. Plate 5 is an example of a fictitious bird generated with an AI image application using a simple prompt of "*generate an image of a tropical Asian flycatcher bird feeding juveniles in a nest*". Note the near photorealism of the image. Those who are not birdwatchers and photographers will easily accept this as a real image with the '*oohs and aahs*' of admiration and social media thumbs up approval that many seek. Critics worry that the 'more real than real' quality of AI images could lead to desensitization and decreased interest in seeing actual birds in real life (Guerrero-Casado *et al.* 2025).

Some Suggestions, Safeguards and Ethical Best Practices in an AI World

1. When you use AI to generate a bird, state explicitly that the work was created with AI and even place a watermark on the image indicating such. This will change the perceptions of the viewer.
2. Avoid over-editing birds with AI applications. We may use AI applications for noise reduction and some sharpening of images but avoid filling in missing parts, rearranging birds or adding any birds. If you do use AI for significant modifications, be transparent and disclose the editing process and AI tools used.

3. For images submitted for bird photography competitions and especially in order to verify rare and new birds (e.g. submission to the MNS-BCC Records Committee) it should be mandatory to submit the original RAW or JPEG files in addition to the processed ones. This allows for an examination of the exchangeable image file format (EXIF) metadata to determine the authenticity of the image. This requirement is getting serious attention by most established birds rarities and record committee worldwide



Plate 5: A fictitious paradise-flycatcher-like bird at nest generated with an AI image model.

Summary

The core tension is between AI's capacity to harm wildlife appreciation through misinformation and its potential to revolutionise conservation using the AI tools. It's not the tools, it's how we use them that matters. We need to be judicious in how we use AI to edit images and routinely state their use when we share images. It is important that we collectively reflect on the use of AI in birdwatching and photography.

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