2024

Wildlife Crime in Scotland

SOCIAL AND ECONOMIC DRIVERS

This report was produced during a Scottish Graduate School of Social Sciences (SGSSS) internship. This report summarises a literature review undertaken to explore evidence about the social and economic drivers behind wildlife crimes in Scotland. The views and findings presented are the author's own and do not reflect the official view of Environmental Standards Scotland.

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Background

The commitment of Environmental Standards Scotland (ESS) to understanding biodiversity decline in Scotland prompted collaboration with social scientists to address specific elements of the subject matter. This report stems from a Scottish Graduate School of Social Science (SGSSS) internship at ESS.

This report focuses on wildlife crime in Scotland, because it is an under-addressed issue (Nurse, 2020). And because wildlife crime and its drivers are sufficiently limited in scope to produce tangible outputs for ESS. The objective is to shed light on this issue's economic and social drivers.

Methodology

The report employs a systematic literature review methodology, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol (Page et al., 2021). This approach helps to ensure rigour, reproducibility and transparency in the review process.

Results

Literature

Eighty-six literature items were reviewed. Data was collected on study information, drivers of wildlife crime, challenges, interventions, research gaps, recommendations, methodological details and study topic area.

Wildlife groups, such as raptors, dominate the attention received by the literature discussing wildlife crime in Scotland. Meanwhile plants, reptiles and amphibians receive scant attention.

Drivers

The persistence of wildlife crime in Scotland stems from the interplay between varied direct motivations of offenders and systemic enabling conditions that shape the risks versus rewards of these offences.

The evidence base identifies economic, entertainment and protest crimes as the most frequently cited direct drivers by the literature on wildlife crime in Scotland:

- economic incentives are the foremost direct driver, with financial motivations mentioned across over half of affected species (highest confidence) and offences range from persecuting revenue-threatening wildlife to trafficking rare specimens
- entertainment motivations like thrill-seeking, hobby collecting, and masculinity demonstrations also frequently drive direct offences (high confidence)
- dismissing criminality and protesting perceived external interference on rural lifestyles enables some protest-motivated crimes (high confidence)
- cultural drivers involve traditions, community impacts and fears around potential rural livelihood disruptions from land use changes (high confidence)
- animal commodification and vermin control attitudes provide justifications for certain crimes (medium confidence)

Thematic analysis highlighted dynamics which position wildlife crimes as attractive opportunities with minimal downsides as:

- weak deterrence, limited enforcement resources, inconsistent training and a culture downplaying seriousness all reinforce notions of low risk (high confidence)
- sentencing leniency, prosecution constraints and poor transparency in the judicial system further hamper deterrence (high confidence)
- outdated laws intended for conservation management and disparities across the UK downplaying severity (medium confidence)

- severe data gaps due to under-reporting, paired with limited scholarly research, constrain evidence-based solutions (high confidence)
- genuine human-wildlife conflicts enabling some offences, but biased priorities overlooking plant crimes and invertebrates allow the continuation of opportunities (high confidence)
- competing land use visions rooted in Scotland's history continuing to fuel modern wildlife conflicts (high confidence)

These dynamics reinforce each other to set the enabling environment for wildlife crime.

1. Introduction

Background

This report stems from a Scottish Graduate School of Social Science (SGSSS) internship at Environmental Standards Scotland (ESS). SGSSS conceived of internship placements aimed at enriching the academic journeys of PhD researchers by exposing them to real-world applications of science and valuable non-academic employment experiences. The author of this report was selected, through open and fair competition, for a 12-week placement with ESS, engaging in a project outlined by ESS.

The project asked for a literature review to answer an overarching research question: What are the social and economic factors influencing biodiversity decline in Scotland? With a particular focus on wildlife crime or land use/management. The expectation of the project included answering the following initial questions subject to further refinement:

- what is the impact of wildlife crime or land use/management on biodiversity in Scotland?
- what are the driving forces behind this problem?
- what insights can Scotland gain from comparative approaches adopted elsewhere?
- how do social and economic factors influence the effectiveness of legal measures in this domain?

Rationale

This report reviews literature pertaining to the drivers of wildlife crime in Scotland. The initial question, ‘what are the social and economic factors influencing biodiversity decline?’, is very broad and requires significant resources to be answered in full. This project is constrained by a 12-week duration and one full-time equivalent

worker. As a result, the author decided to focus on a single aspect of biodiversity decline, namely wildlife crime and its drivers. This section will outline the rationale behind the author's decision to prioritise the drivers of wildlife crime as the focal point of this work.

After an initial scan of the literature, the author determined, in conversation with ESS, that the issue of wildlife crime and its drivers were sufficiently limited in scope to produce a tangible output in the given timeframe: in this case, a written report. Wildlife crime in Scotland and the broader United Kingdom has been under-addressed (Nurse, 2020). The scale of the problem is unknown (Lavorgna and Rekha, 2022). Official statistics hint at a 'dark figure'[1] (Wellsmith, 2011) where crimes remain undetected, known to the public yet unreported, or inadequately acted upon by statutory bodies (UNODC, 2021). The actual number of wildlife crimes may only be known to the perpetrators of wildlife crimes (Murgatroyd et al., 2019). This dark figure is likely both a cause and an effect of the challenges that Police Scotland has in policing wildlife crime. ESS emphasised in its Baseline Evidence Review that, 'it has been difficult to draw conclusions from the available data on the current status of wildlife crime, and more analysis would be required to fully understand progress on mitigation and adaptation strategies' (Environmental Standards Scotland, 2022: 7). Without a sense of the actual size of the problem and why it happens, it is challenging to design appropriate intervention strategies, which may partially explain the fragmented policy and management responses to wildlife crime.

Despite the substantial ecological and socio-economic impacts of wildlife crime, which are of the public interest, wildlife and nature are vital to Scotland's cultural identity, history and economy (Alexander, 2016; BiGGAR Economics, 2023). But the nature of land ownership in Scotland is undergoing significant transformation. This is prevalent in culturally significant landscapes, including large privately owned shooting estates. These landscapes have an increasingly diversifying range of stakeholders striving for influence to reshape traditional land management models (MacMillan et al., 2010; BiGGAR Economics, 2023). The issue of wildlife crime

[1] 'Dark figure' of crime is the number of crimes that go unreported, which raises concern over the accuracy of official crime statistics.

stands at the intersection of these broader debates surrounding land ownership and management. Historically, relatively few individuals have dominated land ownership and management practices (MacMillan et al., 2010; Glenn et al., 2019). However, as public interest in a plurality of land management strategies gains momentum, there is mounting pressure and scrutiny on these landowners to reconsider their practices, some of which might involve the persecution of wildlife groups (MacMillan et al., 2010; Glenn et al., 2019).

While the scope of this report excludes an in-depth exploration of these effects, it is evident that certain wildlife groups, particularly species like golden eagles and freshwater pearl mussels, face severe threats due to wildlife crime (Cosgrove et al., 2016; Fielding and Whitfield, 2017). In an era of heightened global conservation awareness, declines in these charismatic species compromise Scotland's commitments to broader international conservation initiatives. Additionally, wildlife crime may impact sectors like tourism and ecosystem services, although these impacts remain inadequately quantified.

It is thought that the overarching problem of wildlife crime centres on the lack of comprehensive understanding, intervention and policy frameworks to address the social and economic drivers of wildlife crime in Scotland (Tingay, 2015; Nurse, 2020; UNODC, 2021). Consequently, there is an imperative to unravel the complex web of drivers underlying wildlife crime. Developing comprehensive strategies to safeguard Scotland's biodiversity heritage means understanding their social and economic roots. Thus, to address this pressuring issue, this report asks:

Research question

What are the social and economic drivers of terrestrial wildlife crime in Scotland?

Objective

Using evidence from primary and secondary literature sources, identify and explain the historical and current socio-economic factors contributing to wildlife crime in Scotland.

Project scope

This report focuses on the drivers of terrestrial wildlife crime in Scotland, including freshwater species and species covered under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). It does not consider marine wildlife crime, but the report recognises that this choice perpetuates the marginalisation of marine wildlife relative to terrestrial wildlife. However, given the project's constraints, ESS agreed that this scope refinement was proportionate due to a limited timeframe.

Wildlife crime

What is wildlife crime?

The report uses the following definition of wildlife crime, as agreed by the Partnership for Action Against Wildlife Crime (PAW) Scotland in 2010. 'Wildlife crime is any unlawful act or omission, which affects any wild creature, plant or habitat, in Scotland' (National Wildlife Crime Unit, 2022a: 1). In Scotland, wildlife crime includes:

- poaching, coursing, and persecuting animals protected under law
- egg theft and collection
- collection of, or trade in, protected species and animal products
- not registering animals which require a licence
- taking protected plants
- use of poisons, snares or explosives to kill or injure animals
- animal cruelty

- hunting with dogs
- introducing invasive species
- killing or capturing, damaging or destroying the habitat of any protected animal

Legal framework around wildlife crime in Scotland

Scottish wildlife law encompasses various acts and regulations to protect and conserve the country's diverse flora and fauna. Key legislation and protection measures include (for a detailed list of species protection under the law, see Appendix A):

1. **Wildlife and Countryside Act 1981**: this act provides legal protection to a wide range of species, including birds, mammals, reptiles, amphibians and certain invertebrates. It prohibits intentionally killing, injuring, or taking of protected species and damaging or destroying their nests, burrows or resting places. It also regulates the trade of certain protected species
2. **Conservation (Natural Habitats, &c.) Regulations 1994**: these regulations implement the European Union's Habitats Directive in Scotland. They designate particular habitats as protected sites and legally protect European-protected species. This includes bats, otters, European beavers, cetaceans (dolphins, porpoises and whales) and seals. It is illegal to harm, disturb, or destroy these species or their habitats without a licence
3. **Protection of Badgers Act 1992**: this act focuses explicitly on protecting badgers and their setts. It prohibits activities that may harm badgers, including killing, injuring, disturbing or interfering with their setts
4. **Deer (Scotland) Act 1996**: this act regulates the management and conservation of deer populations in Scotland. It establishes closed seasons for deer hunting, imposes conditions for deer stalking and requires management plans to ensure sustainable deer populations
5. **Protection of Wild Mammals (Scotland) Act 2002**: focuses on the welfare and protection of wild mammals in Scotland. It prohibits cruel practices involving wild mammals, including hunting with dogs, hare coursing and

fighting wild mammals. It aims to ensure the humane treatment of wild mammals and prevent unnecessary suffering

6. **Nature Conservation (Scotland) Act 2004**: the act places a duty on all public bodies in Scotland to further the conservation of biodiversity and report on that duty every three years. It requires Scottish ministers to produce and revise a biodiversity strategy and report on its implementation every three years to parliament. The Act sets provisions for the designation of Sites of Special Scientific Interest (SSSI) by Nature Scot, the serving of Nature Conservation Orders and the procedure for the use of Land Management Orders for SSSIs
7. **Marine (Scotland) Act 2010**: this act focuses on managing and conserving Scotland's marine environment. It establishes Marine Protected Areas (MPAs) to safeguard essential habitats, species, and geological features. The act regulates fishing, aquaculture, and marine development to ensure sustainability and environmental protection
8. **Wildlife and Natural Environment (Scotland) Act 2011** extends the regime for controlling invasive and non-native species. It introduced vicarious liability for killing, taking or disturbing wild birds and their nests. It prohibits methods of killing and taking and possessing pesticides. The Act also requires every public body in Scotland to produce a publicly available report on compliance with the Biodiversity Duty every three years
9. **Offshore Marine Regulations 2017**: besides the Marine (Scotland) Act, various regulations govern offshore activities in Scottish waters. The regulations protect marine mammals, such as cetaceans and seals, from disturbance and harm caused by offshore developments, seismic surveys and other industrial activities
10. **Control of Trade in Endangered Species (Enforcement) Regulations 2019**: these regulations enforce international trade regulations, including the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). They control the import, export and trade of endangered species and their products, protecting them from over-exploitation

What are the priorities for wildlife crime management in Scotland?

There are currently six specific Wildlife Crime Priorities in Scotland and the UK (National Wildlife Crime Unit, 2022a):

- bat persecution
- badger persecution
- birds of prey (raptor) persecution
- freshwater pearl mussels
- CITES issues
- poaching and coursing

2. Methodology

This report aims to synthesise available evidence concerning the social and economic drivers of terrestrial wildlife crime in Scotland. To accomplish this, the report employs a systematic literature review, which involves identifying and evaluating primary and secondary literature sources relevant to the research question, ensuring a systematic appraisal of evidence for the eventual conclusions.

To facilitate this process, this report adheres to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol (Page et al., 2021). The PRISMA protocol is an evidence-based set of reporting standards to improve the reporting quality of a systematic review. The PRISMA protocol provides a structured framework for conducting systematic literature reviews (see Appendix B). The PRISMA protocol was selected because it is widely endorsed and adopted, cited by over 60,000 reports and endorsed by almost 200 journals (Page et al., 2021). Using the PRISMA protocol to guide a systematic review is associated with a more complete reporting of systematic reviews (Page and Moher, 2017).

The PRISMA protocol mandates a transparent presentation of inclusion and exclusion criteria, the search strategy, data extraction methods and the approach to

synthesis. The PRISMA protocol adds methodological rigour and transparency, enhancing the reliability of the findings and conclusions. The PRISMA protocol's structured framework guides the systematic review process, encouraging consistency and clarity in reporting methods and results. This approach helps support the study's internal validity and enables external researchers to validate and build upon its findings.

Limitations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses protocol

The protocol helps to provide a reproducible method to enhance the reporting quality of completed systematic reviews. However, publication bias (the tendency for published studies to report positive results more frequently than negative ones) remains an issue. Further tools are available to address this bias, including using unpublished data; however, this was not feasible given the project's constraints. This issue is common to all types of literature review.

The protocol does not guarantee the quality or validity of the included studies. Some studies meeting the eligibility criteria may still have methodological flaws that could impact the overall conclusions. The author attempted to overcome this by including the methodology in the confidence assessment for each literature item. However, the literature covers diverse fields and methodologies outside the author's expertise, so it was difficult to assess this aspect for all literature items confidently.

Finally, the PRISMA protocol has trade-offs. Due to the rigorous reporting process, it is more time-consuming than other types of literature review and requires more detailed reporting. However, this trade-off was considered worthwhile and feasible in conversation with ESS.

Methods

The following section outlines the report's procedures to collect and analyse the data.

Eligibility criteria

Inclusion criteria

The review encompasses evidence from:

- literature discussing the drivers of terrestrial wildlife crime, including the Convention on International Trade in Endangered Species (CITES) in Scotland
- literature discussing the drivers of United Kingdom terrestrial wildlife crime, including CITES, with specific relevance to Scotland
- literature that discusses drivers of global wildlife crime, including CITES, while making distinct references to the United Kingdom
- literature published in the English language
- literature published between the years 2010 and 2023

The decision to limit review to sources published since 2010 was made to increase the relevance of sources to current wildlife crime. Sources in languages other than English were excluded due to capacity and available language skills.

Exclusion criteria

The review omits evidence from the following sources:

- non-English language literature
- literature discussing drivers of terrestrial wildlife crime, including CITES, in Scotland, published before 2010
- literature discussing target wildlife groups, including CITES, in Scotland without reference to wildlife crime
- literature discussing the drivers of wildlife crime, including CITES, in the United Kingdom, but without specific mention of Scotland
- literature discussing the drivers of global wildlife crime, including CITES, without specific reference to the United Kingdom or Scotland

- topics not directly pertinent to the research question regarding drivers of terrestrial wildlife crime, including CITES, in Scotland, such as marine wildlife crime

A comprehensive search was conducted across multiple databases to identify pertinent studies. The search was performed on the following databases:

- Web of Science
- Scopus
- KandE[2]
- Google
- Google scholar

Search strategy

The search strategy began with an initial exploration of prominent sources concerning wildlife crime in Scotland.[3] The objective was to encompass pertinent literature on terrestrial wildlife crime in Scotland. This initial search devised a preliminary set of 'naïve' search terms, drawing from keywords present in wildlife crime definitions within notable sources on Scottish wildlife crime.

Subsequently, the naïve search terms were refined using a rapid and reproducible approach, as Grames et al. (2019) outline. This technique strives to pinpoint the most pivotal terms for this review. The resultant systematic search chain was then sense checked with key stakeholders.

An illustrative instance of the search strategy employed in Scopus is available in Appendix C. Furthermore, the review employed a snowball, or chain-referral, approach (Goodman, 1961) to identify less visible sources of evidence by following relevant references and citations. This technique helps uncover studies that might not be easily found through traditional searches, enhancing the comprehensiveness

[2] The Scottish Government's literature portal
[3] E.g. Wildlife Crime Scotland: Annual Report 2021, National Wildlife Crime Unit Strategic Assessment 2022

of the review.[4] In particular, the snowball approach was used to identify secondary literature, such as reports.

Selection of sources of evidence

A systematic approach governed the selection of evidence sources for this systematic review. The sources included:

- peer-reviewed journal articles from electronic databases
- grey literature sources, such as reports, policy documents and book chapters, but books were excluded due to the project's time constraints
- snowball searching of reference lists of included studies and relevant review articles
- consultation with experts to identify additional relevant sources

The selection of sources aimed to capture a comprehensive spectrum of evidence associated with terrestrial wildlife crime in Scotland. A single reviewer screened the titles and abstracts of the identified articles, evaluating their eligibility in accordance with the inclusion and exclusion criteria.[5] Full-text articles were retrieved for further assessment if they met the screening criteria.

Data items

A standardised data extraction form was developed to extract relevant information from the included studies (see Appendix D). The following data items were extracted:

- **study information**: author details, publication year, title, source, study design and digital object finders (DOIs)

[4] However, it introduces a level of subjectivity, potential bias and its use is complemented by rigorous appraisal to ensure the quality and relevance of the included sources.
[5] Ideally, a second reviewer would independently screen the titles/abstracts. Any disagreements would be resolved by consensus or a third reviewer. Due to the constraints of this project multiple reviewers was not possible.

- **study topic areas**: encompassing the specific crime types covered (e.g. poaching, illegal trade, habitat destruction) and the species impacted or targeted
- **methodological details**: comprising research design (e.g. case study, survey), data collection methods (e.g. interviews, observations), geographic context, sample size and sampling method
- **incident data**: encompassing crime statistics, temporal coverage, geographical distribution of incidents and types of evidence utilised in crime investigations
- **drivers of wildlife crime**: spanning social, political, economic and environmental factors contributing to wildlife crime
- **challenges and interventions**: identifying obstacles to addressing and preventing wildlife crime and interventions proposed to combat it
- **impacts and consequences**: delving into ecological repercussions of wildlife crime, socio-economic effects on local communities and stakeholders, and efforts to mitigate these impacts
- **research gaps and recommendations**: identifying areas requiring further research and suggestions by authors to tackle wildlife crime in Scotland
- **additional relevant information**: incorporating other pertinent details related to the research question

Critical appraisal of individual sources of evidence

The evidence sources were assessed through a critical appraisal process, employing an adapted version of The Joanna Briggs Institute Critical Appraisal Checklist (Aromataris et al., 2015) to classify sources into high, medium, and low confidence levels. This checklist facilitated the evaluation of evidence sources based on the following criteria:

- **research question:** scrutinising the clarity and explicitness of the stated research question
- **methodology:** evaluating the suitability of the chosen methodology in addressing the research question

- **sampling:** assessing the appropriateness of sample size in alignment with research aims and justifying the chosen sampling technique
- **timeliness:** determining the recency of the publication
- **authorship**: investigating author identities and potential influences on research interpretation
- **applicability:** analysing whether the study's scope is specific to Scotland or offers more generalised conclusions
- **peer-reviewed:** verifying whether the study has undergone quality assurance such as peer review

This checklist is intended to provide rigour and reproducibility to the critical appraisal process. However, it is important to acknowledge that categorising evidence into high, medium, and low confidence levels in this context is subjective and should be interpreted cautiously.

Quality assurance processes

Informed by the critical appraisal of individual sources of evidence, the report employs confidence statements adapted from The National Wildlife Crime Unit's Strategic Assessment Report (2022). The confident statements indicate the quality of the sources that the statement uses as evidence.

Confidence statement

Language	Evidence
Highest confidence	**Based on evidence from sources assessed as highly reliable and corroborated by a range of different sources.**
High confidence	**Based on evidence from sources assessed as high reliability, although not corroborated from a range of different sources, or based on evidence from sources.**

	assessed as medium reliability and corroborated from a range of other sources.
Medium confidence	**Based on evidence from sources assessed as medium reliability but not corroborated from a range of different sources or originating from evidence assessed as low reliability and corroborated from a range of other sources.**
Low confidence	**Based on evidence from sources assessed as low reliability and not corroborated from a range of different sources and or biases/interests declared.**

Table 1. Confidence statement table.

This rubric is intended to provide rigour, reproducibility and space to communicate uncertain evidence. However, it is important to note the subjectivity in this process.

Data charting

The extracted data is charted and organised using tables or matrices to facilitate data synthesis. The charting process involved categorising and summarising the extracted information according to predetermined and inductive themes.

Drivers of crime

The drivers of wildlife crime in Scotland were incorporated as data items into the data extraction form upon identification within individual literature items. The drivers of wildlife crime were classified into indirect and direct drivers.

Direct drivers

Direct driver categories were established prior to the data collection. The report employed a typology devised by Nurse (2011). The typology distinguishes between

direct drivers, which represent the immediate motivations behind criminal actions. These encompass various categories:

- **Traditional or cultural reasons**: crimes committed to upholding specific ways of life, cultural practices and beliefs, exemplified by maintaining grouse moors to preserve shooting culture or trading plants as traditional medicines
- **profit or commercial gain**: crimes driven by economic motives, where the criminal derives direct economic benefits or perceives wildlife as competition. For instance, theft of pearls from freshwater mussels for sale, illegal export of eels or when legal bat protection interferes with development projects
- **food**: crimes committed for obtaining meat, such as poaching deer and consuming illegally caught salmon
- **entertainment**: crimes for amusement and recreation, lacking direct benefits or underlying necessities. Examples include illegal plant collection for personal collections or hunting wildlife with dogs for recreation
- **attitudes**: crimes are influenced by socially constructed perceptions of animals, such as fear, dislike, or viewing wildlife as a liability due to potential damage. Examples encompass killing adders due to bite risks or regarding badgers as vermin
- **antipathy towards external bodies**: crimes driven by offenders' disagreement with the perception of their actions as criminal, or dislike of external intervention. This category includes mature bird egg collectors arguing the legitimacy of their activities, or illegal killing of reintroduced wildlife to protest external agency imposition
- **accidental**: crimes committed unintentionally, often due to a lack of awareness. Instances comprise inadvertently killing amphibians and reptiles during mowing or unknowingly engaging in the illegal trade of goods due to ignorance of CITES laws

Direct driver	Description	Example
Traditional or cultural reasons	Crimes to maintain cultural practices or beliefs	Raptor persecution to preserve shooting culture
Profit or commercial gain	Economic motives behind crimes	Theft of pearls from freshwater mussels
Food	Crimes for obtaining meat	Illegal salmon poaching
Entertainment	Crimes for amusement	Illegal plant collection for collections
Attitudes	Crimes due to animal perceptions	Killing adders due to fear
Antipathy towards external bodies	Crimes due to disagreement	Killing reintroduced wildlife in protest
Accidental	Unintentional crimes	Unknowingly trading illegal goods

Table 2. Typography of direct drivers of wildlife crime (Nurse, 2011).

Indirect drivers

Indirect drivers delve into the socio-economic context underpinning wildlife crime, revealing the structural and foundational reasons for wildlife crime in Scotland. Indirect drivers were identified using an inductive approach, allowing themes to emerge from the data during the analysis.

Data synthesis

Bibliographic data

Bibliographic data were integrated as data items into the data extraction form upon identification in individual literature items. Bibliographic data were analysed in R Studio using descriptive statistics to visualise the literature breakdown by geography, content and time.

Indirect drivers

A narrative synthesis approach was employed to summarise findings from the included literature. The synthesised data underwent thematic analysis, using inductively derived themes, to uncover indirect or underlying drivers of crime, along with discernible patterns and gaps in the literature concerning terrestrial wildlife crime in Scotland.

Direct drivers

The direct drivers were classified in the data extraction form when identified by an individual literature item. If distinct drivers were discussed within a single literature item, these were logged separately for each literature item. For instances where a single driver was reiterated multiple times within a single literature item, it was recorded only once. During the analysis of direct drivers, driver frequency was not weighted, nor influenced by the critical appraisal results. Each literature item was treated equally regardless of whether it scored a high, medium, or low score.[6] The direct drivers were analysed in R Studio using descriptive statistics to visualise the frequency of drivers overall and per wildlife group.

[6] This caveat should be noted when interpreting the results of the direct drivers of wildlife crime in Scotland. This is not the case for other sections detailed in the report.

In the subsequent section, the results are presented descriptively. The report highlights key drivers and outlines conclusions from the literature. Where needed, contextual elucidations are provided to enhance reader understanding.

3. Results

Selection of sources of evidence

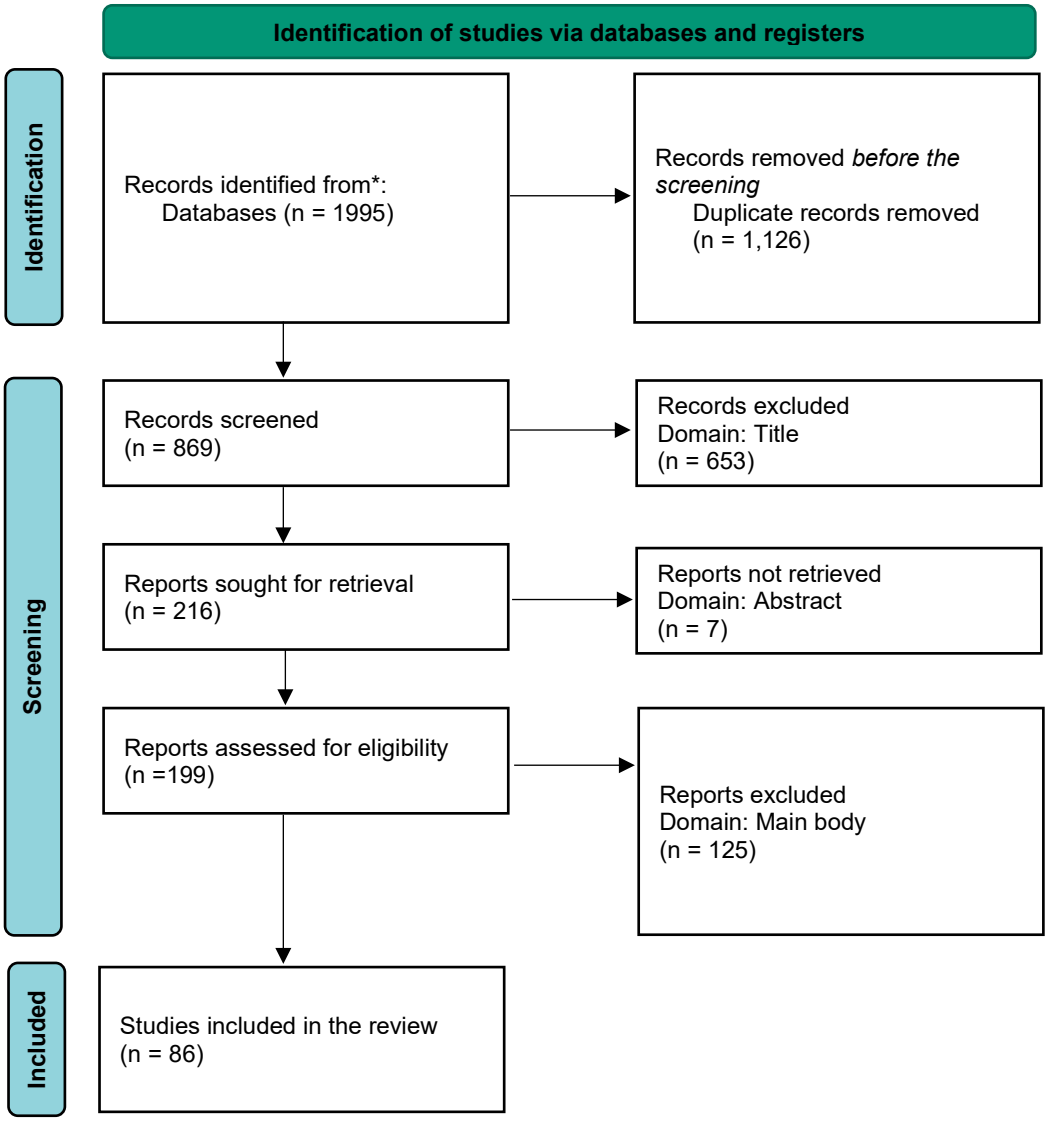

Figure 1. PRISMA 2020 literature search flow diagram for new scoping reviews. Adapted from Page et al., 2020.

The systematic literature search conducted across the selected databases yielded a total of 1995 search results (Fig. 1). Following the initial screening, 1126 duplicates were removed, leaving 869 articles for title screening. From these, 653 articles were excluded based on their titles not aligning with the research question's scope. Subsequently, 216 articles were retained for abstract screening, leading to the

removal of seven more articles. The remaining 199 articles underwent a comprehensive review at the full-text level and were evaluated against the predefined inclusion and exclusion criteria. Among these, 125 articles were excluded, while an additional 12 articles were identified through the snowball sampling approach. This resulted in a final selection of 86 literature items for inclusion in the review.

Characteristics of the literature

Publication status

The majority of the selected literature (n = 54) had undergone a formal peer-review process and had been published in academic journals (Fig. 2). The remaining literature (n = 32) encompassed a range of quality assurance processes, spanning from government reports to publications from advocacy groups.

Figure 2. Breakdown of the literature by publication type.

Geography of the literature

Among the selected literature, the focus was primarily on Scotland alone for 50 items (Fig. 3). A smaller subset addressed wildlife crime within the context of the entire

United Kingdom (n = 30), or had a global perspective with specific mention of the UK (n = 6).

Wildlife crime frequency

Figure 3. Breakdown of the geography of the literature identified by the scoping review.

In terms of wildlife crime categories, raptor crime emerged as the most frequently mentioned type across all literature types and geographies (n = 37), followed by plant crime (n = 16) and deer crime (n = 16) (Fig. 4). In contrast, crimes related to eels were discussed the least (n = 2).

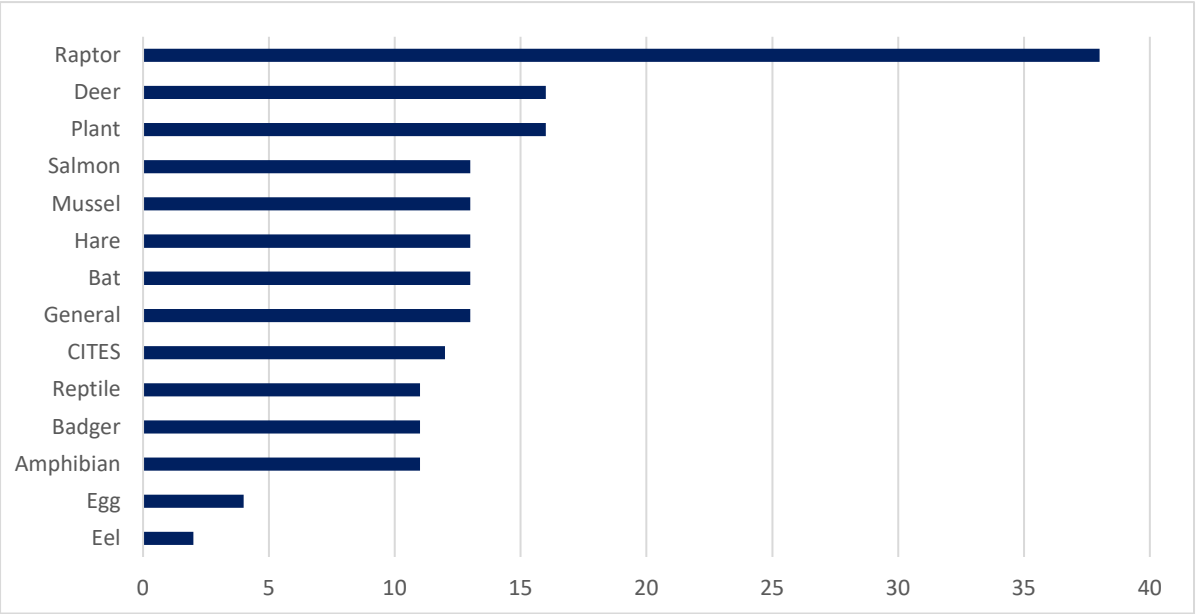

Figure 4. Frequency of wildlife groups discussed by the literature identified in the scoping review. Literature that discussed wildlife crime in Scotland or the UK specifically, but did not mention particular wildlife, is classed as general.

Wildlife crime frequency by geography

Further examination of the literature revealed variations in attention paid to specific wildlife crimes within Scotland. Raptor crime dominates and is covered in detail by the Scottish (n = 22) and UK literature (n = 16) (Fig. 5). Bats, mussels, hare, CITES and salmon are covered by the Scottish and UK literatures but at lower frequencies and often in generalised terms. Plant crime is not covered well by Scottish (n = 3), nor UK literature (n = 4), and is only discussed in detail at a global scale (n = 7).

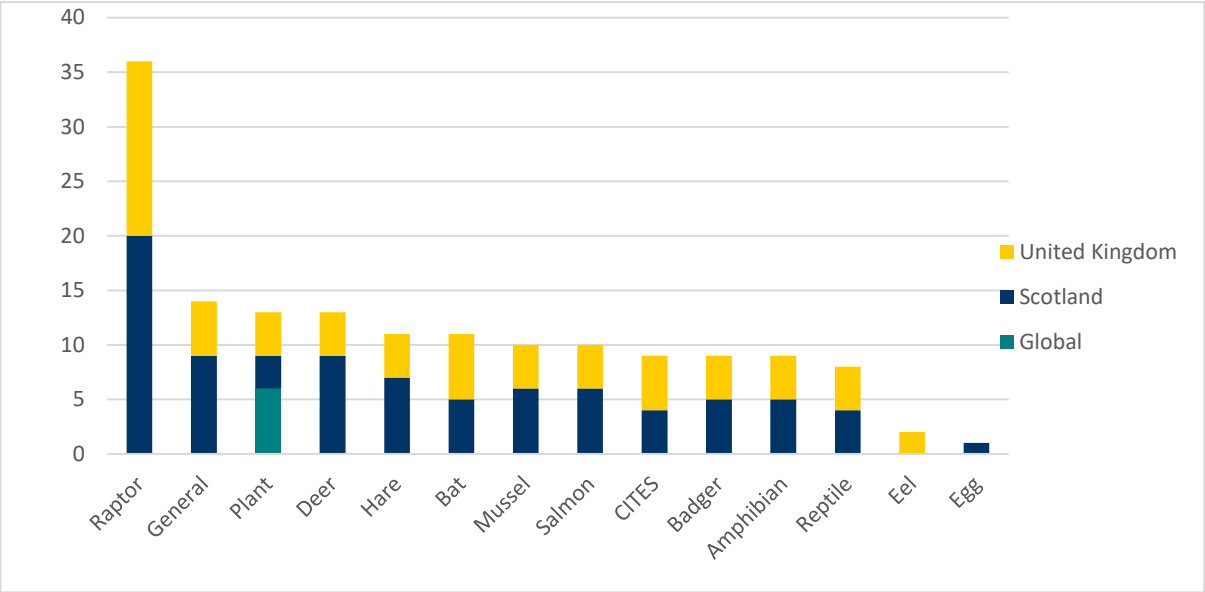

Figure 5. Breakdown of the coverage of wildlife groups by literature geography.

Literature coverage through time

A notable trend was the concentration of literature published since 2018 (n = 57), demonstrating a consistent timeline across various wildlife groups. Except for freshwater pearl mussels, with limited publications since 2016. This temporal distribution of literature reflects the recent attention and growing interest in the issue of wildlife crime across different wildlife categories.

Synthesis of results

This section synthesises evidence on the critical drivers of wildlife crime in Scotland from the evidence base. Direct motivations of perpetrators are covered first, based on frequency across taxa. Indirect systemic factors enabling offences are then detailed.

Direct drivers

Profit motives

The evidence base identifies profit and commercial gain as the most frequently cited direct drivers of wildlife crime in Scotland (n = 36 sources, Fig. 6). Economic

motivations emerge across 57% of the 14 analysed wildlife groups (Fig. 7). These crimes involve situations where perpetrators directly benefit financially, view wildlife as economic competition, or anticipate financial gains from wildlife crime.

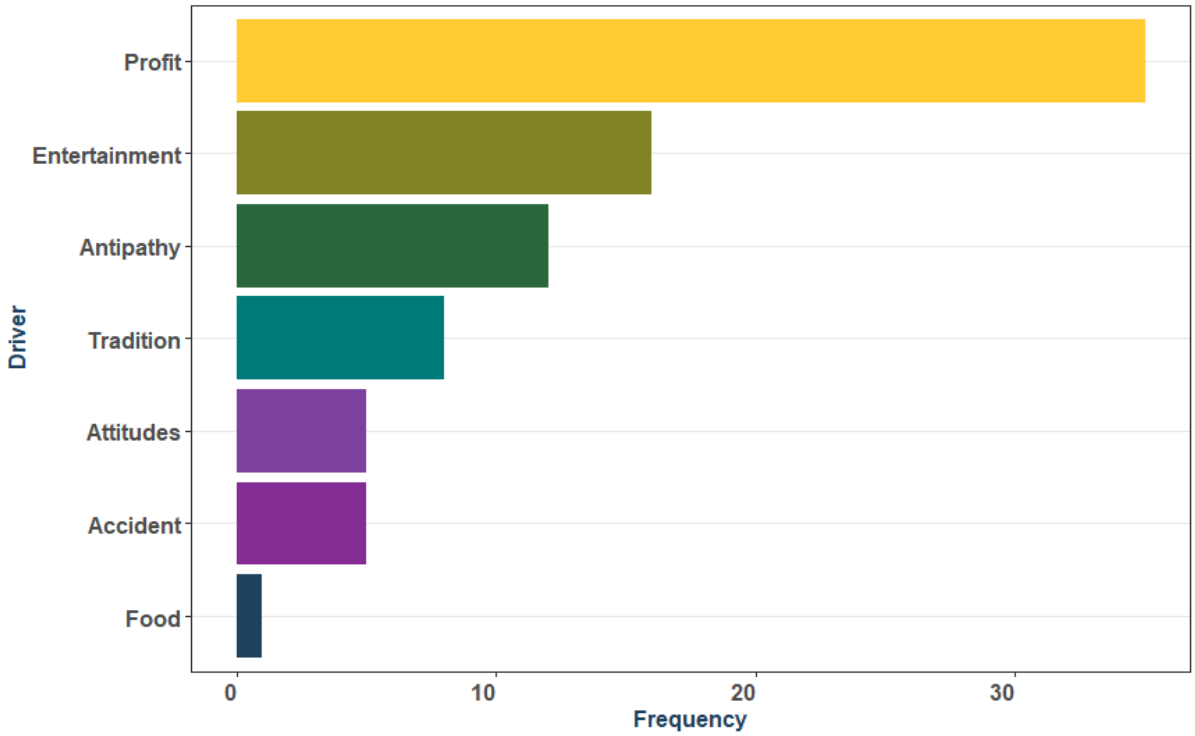

Figure 6. Frequency of the direct drivers of wildlife crime mentioned by the literature identified in the scoping review. Profit motives or commercial reasons (N=35) are the most frequently mentioned driver of wildlife crime. Food movies (N=1) are the least frequently mentioned by the literature.

Economic competition and financial gains

Specifically, bats, badgers and raptors face persecution linked to perceived interference with human activities and associated economic impacts. 73% of sources emphasise profit motives in crimes against these species (Fig. 7). The intentional targeting of raptors aims to protect hunting revenues [highest confidence] (Amar, 2012; Hodgson et al., 2018; Newton, 2021; RSPB, 2021). For example, hen harriers and peregrine falcons can reduce red grouse populations, directly affecting hunting income through reduced grouse bags [high confidence] (Hanley et al., 2010; Sotherton, Baines and Aebischer, 2017; Francksen et al., 2019). Stakeholders in grouse management express concerns about the viability of shooting estates if

raptor populations were uncontrolled [highest confidence] (MacMillan et al., 2010; Sotherton, Baines and Aebischer, 2017; Hodgson et al., 2018). Demonstration estates aiming to conserve raptor populations and maintain shooting culture have thus far failed to restart the most intensive form of shooting management [medium confidence] (Sotherton, Baines and Aebischer, 2017).

Similarly, bat and badger crimes are motivated by cost-saving measures [medium confidence] (Scottish Environment LINK, 2015; Bat Conservation Trust, 2017; National Wildlife Crime Unit, 2022a). Disturbing roosts and setts avoid survey and mitigation expenses, primarily regarding land/property development [low confidence] (Tingay, 2015; National Wildlife Crime Unit, 2022a).

Context box: gamebird shooting

Grouse shooting is a revered Scottish outdoor sport occurring mainly in August and September. It involves hunting native red grouse, traditionally in two ways: driven and walked-up grouse shooting.

Driven grouse shooting is a more intensive form of shooting that requires active management by teams of gamekeepers who drive grouse towards shooters. Walked-up shooting is a more informal style, where small groups traverse moorlands, flushing and shooting individual grouse in flight. This approach requires fewer staff.

Grouse shooting is intertwined with land management and conservation, fostering suitable habitats through practices like controlled burning. This benefits both grouse and other species. However, the practice is contentious. Advocates highlight economic support, conservation, and cultural preservation. Critics emphasise concerns about intensive moorland management's environmental impact, illegal practices, and animal welfare.

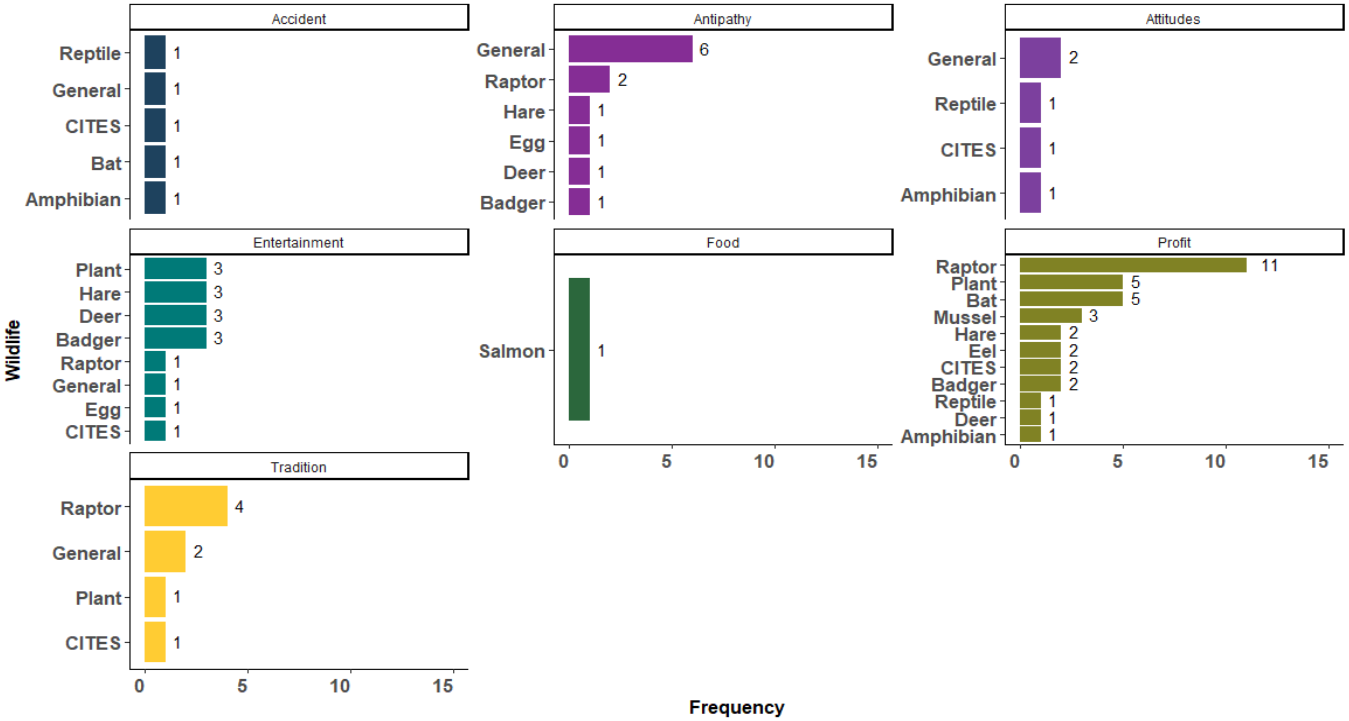

Figure 7. Frequency of the direct drivers of wildlife crime by wildlife group as mentioned by the literature identified in the scoping review. Profit motives or commercial reasons (N=35) are the most frequently mentioned driver of wildlife crime. Food motives (N=1) are the least frequently mentioned by the literature.

Lucrative wildlife trade

Illicit trade in CITES-listed and non-CITES-listed plants and animals presents major financial incentives, enabling significant illegal transactions. The literature highlights profit motives in 56% of plant crime sources. The desire to sell rare specimens at premium prices, driven by potential lucrative gains, emerges as a critical factor [high confidence] (Lavorgna et al., 2020; Lavorgna and Sajeva, 2021; Whitehead et al., 2021). The allure of authenticity propels this trade, potentially spurring unauthorised collection beyond CITES regulations [medium confidence] (Lavorgna and Sajeva, 2021). Similarly, a market for young Scottish birds of prey exists in parts of Europe and the Middle East, with species like peregrine falcons commanding high prices [low confidence] (Scottish Environment LINK, 2015). Pearl mussels are illegally killed in large numbers every year, driven by pearl fishing, with the high price of pearls a

key driver [medium confidence] (Cosgrove, Hastie and Sime, 2012; Cosgrove et al., 2016).

Secondary financial motivations

Secondary financial motivations include gambling on wildlife crimes like deer and hare coursing. While entertainment primarily drives coursing, betting remains significant [high confidence] (Nurse, 2011, 2012; National Wildlife Crime Unit, 2022a). Similarly, badger baiting with dogs often involves betting [low confidence] (Wildlife and Countryside and Link, 2021).

Summary

In summary, the literature identifies economic and financial motivations as the predominant drivers of wildlife crimes in Scotland. These economic drivers range from direct profit incentives [high confidence] to cost-saving measures [high confidence]. Perpetrators directly benefit from, or anticipate financial gains through, activities like persecuting species interfering with revenues [high confidence], avoiding mitigation expenses [medium confidence], trafficking rare specimens [medium confidence] and gambling on blood sports [medium confidence].

Entertainment motives

Entertainment emerges as Scotland's second most frequently identified direct driver of wildlife crime (n = 16 sources, Fig. 6). Like profit motivations, entertainment features consistently across 50% of the 14 wildlife groups analysed (Fig. 7). These crimes include illegal activities undertaken as hobbies, and more sinister offences involving animal harm that allow socialising among like-minded individuals and demonstrations of masculinity.

Hobbyist crimes

'Hobbyist' criminals commit high status, low-level offences without underlying criminal needs (Nurse, 2011). This includes mature egg collectors who view the

activity as a lifestyle choice and desire to own eggs and trade collections, having started the practice legitimately as schoolboys [medium confidence] (Nurse, 2011). These individuals delight in the activity, excited for the upcoming season, sometimes in an obsessional manner [medium confidence] (Nurse, 2011). Similarly, illegal plant collectors can be motivated by owning rare specimens for their novelty and authenticity and wanting to be the 'first' owner of new varieties [medium confidence] (Lavorgna et al., 2020; Wildlife and Countryside and Link, 2021). These motivations link to gaining status among similar communities through crimes [medium confidence] (National Wildlife Crime Unit, 2022a).

Thrill-Seeking and masculinity

More concerning are criminals harming animals for the thrill. Increasingly there are reports of young men illegally hunting wildlife in small packs, coursing and killing badgers, hares and deer [high confidence] (Nurse, 2011; Scottish Environment LINK, 2015; National Wildlife Crime Unit, 2022a). These wildlife offenders are predominately male and their crimes are an outlet for aggression [high confidence] (Nurse, 2011, 2012). These criminals may derive some financial gain from gambling around the action, but it is not the primary motivator [high confidence] (Nurse, 2011; National Wildlife Crime Unit, 2022a). The activities help confer status to young men, allowing them to exercise masculine stereotypes based upon perceived cultural acceptance of toughness, aggressiveness, cleverness and a love of excitement [high confidence] (Nurse, 2011; Scottish Environment LINK, 2015; National Wildlife Crime Unit, 2022a). Offenders often record and post incidents online to demonstrate their prowess [medium confidence] (Scottish Environment LINK, 2015; National Wildlife Crime Unit, 2022a).

Summary

In summary, entertainment motivations like hobby collecting [medium confidence], thrill-seeking [high confidence] and demonstrations of masculinity [medium confidence] feature prominently as wildlife crime drivers in Scotland.

Antipathy

Antipathy towards government and law enforcement emerges as the third most cited driver, featuring in 50% of sources reviewing wildlife crime drivers generally rather than for specific taxa (Fig. 7). These ‘protest crimes’ stem from a sense that activities are not severe or criminal offences (Nurse, 2011).

Protesting outside interference

Some perpetrators protest perceived external interference in rural communities, questioning the legitimacy of outside management. For instance, reintroducing raptors without perceived due consideration of affected groups can spur conflicts [highest confidence] (Redpath et al., 2013; Molenaar et al., 2017; Bavin et al., 2023), especially if agencies are perceived to lack practical land management experience and impose impractical regulations [highest confidence] (Hodgson et al., 2018; Bavin et al., 2023). Rural residents and land managers may view policymakers as misinformed and disconnected from the countryside [highest confidence] (Dinnie, Fischer and Huband, 2015; Hodgson et al., 2018), reinforcing their claims as true countryside knowledge holders. This may limit the government’s ability to shape outcomes when land managers resist adopted policies [medium confidence] (Redpath et al., 2013). This outlook helps offenders to dismiss wildlife crimes as merely ‘illegal’ per outsider rules, rather than intrinsically criminal.

Offenders dispute criminality

Offenders often argue that their actions are not crimes. For instance, mature egg collectors insist they are not criminals since collecting was once legal [high confidence] (Nurse, 2011; National Wildlife Crime Unit, 2022a). Pearl fishers brazenly leave shells at crime scenes, believing their activities are not severe offences [medium confidence] (Cosgrove, Hastie and Sime, 2012; Cosgrove *et al.*, 2016). In some communities, badger baiting is described as “what always been done”, performed for the good of the community [medium confidence] (Nurse, 2012: 11). The same source, when informed these actions were illegal badger persecution, insisted their family’s actions were legal: “my dad says it is okay to do that” [medium

confidence] (Nurse, 2012: 11). Offenders justify actions by framing activities as legal practices rather than crimes, admitting criminality by others, like poachers, but denying their own, or dismissing it as an error of judgment [high confidence] (Nurse, 2011, 2012).

Summary

In summary, sentiments of protesting perceived outside interference [highest confidence] and believing activities do not constitute real crimes [medium confidence] enable some wildlife offences in Scotland.

Traditions and cultural beliefs

Traditions and cultural beliefs emerge as the fourth most commonly cited driver across the evidence base, though mainly in cases of raptor crime and general wildlife crime. These crimes stem from traditional wildlife uses, cultural lifestyles and fears of changing livelihoods.

Specific cultural beliefs around wildlife uses

Certain wildlife crimes in Scotland are linked to cultural beliefs about using certain wildlife products. For instance, pearling techniques are handed down in families, with pearls kept for collection [medium confidence] (National Wildlife Crime Unit, 2022a). Wild-sourced plants are also preferred for perceived quality benefits [medium confidence] (Lavorgna et al., 2020).

Shooting culture and tradition

Shooting culture is seen as a traditional countryside activity with social importance. Grouse shooting provides non-financial benefits for owners, as grouse shooting enterprises are rarely profitable as stand-alone activities [high confidence] (MacMillan et al., 2010; BiGGAR Economics, 2023; Scottish Government, 2023). Instead, owning a sporting estate is a lifestyle choice, where management practices remain highly traditional, with innovations frowned upon [high confidence] (MacMillan

et al., 2010). Despite varied backgrounds, landowners uniformly value maintaining rituals like hunting and shooting because of their social significance [high confidence] (MacMillan et al., 2010; Thompson et al., 2020).

Rural community impacts

While shooting generates limited estate profits, it provides rural community livelihoods and cultural identity [highest confidence] (Thompson, McMorran and Glass, 2018; Thompson et al., 2020). Jobs are often vocational and span generations, with housing tied to employment [high confidence] (Thompson et al., 2020). Gamekeepers play vital community roles [high confidence] (Thompson et al., 2020). Junior gamekeepers on shooting estates learn techniques of poisoning and trapping through interactions with established staff [medium confidence] (Nurse, 2011). Losing shooting could mean job and housing losses, along with cultural changes.

Livelihood change fears

A lack of predator control success for gamekeepers can imply job failure and losing family housing [medium confidence] (Nurse, 2011). There are fears that under alternative land uses, job and housing losses could rupture cultural lifestyles, because shooting estates provide higher per-hectare employment than other moorland land uses like forestry [high confidence] (Sotherton, Baines and Aebischer, 2017; Thompson, McMorran and Glass, 2018; Thompson et al., 2020). Transitioning from grouse shooting will impact rural economies and communities.

Summary

In summary, cultural motivations like traditional practices [high confidence], beliefs around wildlife use [high confidence] and fears of rupturing rural lifestyles [medium confidence] enable some wildlife crimes in Scotland.

Attitudes towards animals

Individual attitudes towards animals are an infrequently cited driver of wildlife crime in Scotland (n = 5 sources, Fig. 6), found across 29% of wildlife groups (Fig. 7). Crimes of attitude relate to social perceptions of animals, ranging from vermin control to hobby pursuits.

Vermin control

Certain animals may be deemed vermin and persecuted through poisoning, gassing or trapping to remove them from a location [medium confidence] (Scottish Environment LINK, 2015; National Wildlife Crime Unit, 2022a). Adders are killed over bite risks to people and livestock [medium confidence] (National Wildlife Crime Unit, 2022a), while bats experience persecution out of fear or dislike [medium confidence] (Scottish Environment LINK, 2015; Bat Conservation Trust, 2017). The use of terms like “pests” and “predators” reinforces these attitudes and justifies lethal control [low confidence] (Scottish Environment LINK, 2015).

Denial of suffering

Wildlife is often valued solely in economic terms, with legal protections limited to aligning with the utility of the animal [high confidence] (Nurse, 2012, 2020). Some crimes stem from treating animals as commodities for hobby collection or sport [medium confidence] (Nurse, 2020). For instance, coursing enthusiasts argue that prey enjoy the chase and cannot feel harm [medium confidence] (Nurse, 2020). Such rationalisation reinforces views of animals as commodities, rather than sentient beings which may suffer due to an individual’s actions [medium confidence] (Nurse, 2011). This reveals that complex views persist around animals as protected yet exploited for shooting sports [medium confidence] (Nurse, 2012).

Summary

In summary, varied individual attitudes towards animals, ranging from commodities [medium confidence] to vermin [medium confidence], enable rationalisations of certain wildlife crimes.

Accidental

Accidents emerge as cited drivers in the literature across several taxa, particularly herpetofauna (reptiles and amphibians). These crimes stem from simple mistakes and a lack of awareness.

Accidents and lack of awareness

Some wildlife crimes occur accidentally rather than with criminal intent. Amphibians and reptiles are sometimes inadvertently killed during land management activities, like road verge mowing or conservation work on nature reserves [low confidence] (Wildlife and Countryside and Link, 2021). Grass snakes and slow worms can be killed because they are confused with adders [low confidence] (Wildlife and Countryside and Link, 2021). While unfortunate, these accidental deaths during legal practices would not typically constitute offences.

Lack of awareness around laws like CITES also leads to unintentional illegality. For instance, tourists may unknowingly bring back illegal wildlife products like coral or rosewood from holidays without proper permits [medium confidence] (Lavorgna et al., 2020; Wildlife and Countryside and Link, 2021). Advertisements for illegal plants on mainstream online platforms can reinforce assumptions that the products are legal, misleading naïve buyers [medium confidence] (Lavorgna et al., 2020).

Summary

Factors like ignorance of wildlife legislation [medium confidence], confusion around complex rules [medium confidence], lack of public awareness and unintended

collateral damage during legal land use practices [low confidence] can all contribute to some accidental wildlife crimes.

Food motivations

Food motivation is the least frequently cited driver of wildlife crime. Some wildlife crimes are driven by the goal of obtaining food or ingredients. Salmon, sea trout, brown trout and rainbow trout are highly prized for their meat [medium confidence] (National Wildlife Crime Unit, 2022a). European eels have been caught as food sources for centuries [medium confidence] (National Wildlife Crime Unit, 2022b). These appetites for specific species as food or ingredients incentivise some offenders to acquire wildlife illegally [medium confidence].

Direct drivers conclusion

In conclusion, varied individual-level drivers in order of importance include economic incentives, entertainment, protest sentiments, cultural factors, attitudes towards animals and motivations like food. Financial motivations and profit protection lead to the persecution of economically threatening species [highest confidence]. Entertainment drivers involve thrill-seeking, masculinity and hobbies like egg collecting [medium confidence]. Dismissing the legitimacy of laws enables some protest crimes [high confidence]. Cultural traditions and rural livelihoods factor into certain offences [high confidence]. Varied attitudes shape perceptions of animals as commodities or pests [medium confidence]. These direct reasons illustrate why perpetrators commit wildlife crimes, but systemic factors enable wildlife crime by shaping its risks versus rewards.

Indirect drivers of crime

Introduction

This section synthesises evidence on the indirect factors enabling wildlife crime in Scotland. Indirect drivers refer to systemic and contextual conditions that facilitate offences in contrast to the direct motivations of perpetrators.

Low risk and high reward dynamics enable wildlife crime

Many potential wildlife criminals view offences as low-risk activities with high reward potential. This manifests in brazen attitudes like posting crimes online and openly admitting to illegal acts [high confidence] (Lavorgna et al., 2020; Lavorgna and Sajeva, 2021; National Wildlife Crime Unit, 2022b) and similarly when developers are willing to risk criminal activity as enforcement is unlikely [medium confidence] (Bat Conservation Trust, 2017; National Wildlife Crime Unit, 2022a).

Low-risk perception

These attitudes stem from crimes being easy to hide and hard to detect. Illicit wildlife trade frequently occurs anonymously online in largely unpoliced spaces [high confidence] (Lavorgna et al., 2020; Lavorgna and Sajeva, 2021; National Wildlife Crime Unit, 2022b). Other offences like illegal fishing happen in remote areas where detection and witnesses are unlikely [high confidence] (Cosgrove, Hastie and Sime, 2012; Cosgrove et al., 2016). For example, there have been no successful prosecutions of pearl fishers [low confidence] (Cosgrove et al., 2016). Evidence like raptor corpses can also be readily relocated or discarded [high confidence] (Scottish Environment LINK, 2015; Tingay, 2015; RSPB, 2021; National Wildlife Crime Unit, 2022a). As a result, the chances of crimes being discovered, reported and prosecuted are slim, reducing deterrence [high confidence] (Nurse, 2012, 2020).

Punishments also fail to act as deterrents. Conservation stakeholders express frustration with the criminal justice system where crimes have been inadequately

investigated with low prosecution rates, and even when convicted, low fines and short sentences are given to offenders [high confidence] (St John, Edwards-Jones and Jones, 2012; Scottish Environment LINK, 2015; Bat Conservation Trust, 2017; Nurse, 2020; UNODC, 2021). Sentences rarely contain rehabilitative elements to prevent reoffending [medium confidence] (Nurse, 2012). The combined low risks of discovery and punitive sentencing can facilitate criminal activity.

High reward potential

Wildlife crimes can be highly profitable. The global illegal wildlife trade is worth up to £17 billion annually [medium confidence] (National Wildlife Crime Unit, 2022b). Plant smuggling is described as “lucrative” with “low sentences and high profits” [medium confidence] (Lavorgna and Sajeva, 2021). While the legal grouse shooting industry in Scotland provides thousands of jobs and millions in economic impacts and wages [high confidence] (Thompson, McMorran and Glass, 2018), with intensive operations yielding up to £5,000 per grouse brace [high confidence] (Thompson, McMorran and Glass, 2018).

Summary

In summary, perceptions of low enforcement risks [high confidence] combine with potentially large illicit profits or cost savings [medium confidence] to position wildlife crime as high reward, low risk.

Systemic law enforcement challenges

Wildlife crime is seen as a low-risk activity for potential criminals, partly because of problems in law enforcement. Conservation stakeholders repeatedly express their frustration over delayed response times, lost evidence and poor use of resources to investigate wildlife crime. As a result, some non-governmental organisation (NGO) stakeholders lack confidence in the ability of statutory agencies to investigate wildlife crime adequately. Calls for stricter laws and sentencing might only be effective with corresponding improvements in the enforcement regime [high confidence] (Nurse, 2011, 2012, 2020; Wellsmith, 2011).

Funding

Limited funding severely constrains effective policing of wildlife crime. The National Wildlife Crime Unit (NWCU), a critical central resource for intelligence and investigative support, constantly battles for its existence despite tremendous value [high confidence] (Nurse, 2012; UNODC, 2021). Its approximately £580,000 annual budget may not be able to support strategic planning, training, equipment, or experienced staff recruitment [medium confidence] (UNODC, 2021). The UK Government has opted for single-year rather than multi-year spending reviews in recent years, so the NWCU must request funds annually [medium confidence] (UNODC, 2021). In 2021, this process took three months before approval was granted [medium confidence] (UNODC, 2021). Wildlife crime requires proactive, expert investigation, but this uncertain funding horizon deters experienced investigators [medium confidence] (Nurse, 2012; UNODC, 2021). Underinvestment in dedicated policing units can encourage a reactive approach relying on overstretched officers lacking specialised skills [medium confidence].

Content box: what is the National Wildlife Crime Unit?

The National Wildlife Crime Unit (NWCU), now based in Stirling, Scotland, represents the first fusion centre of its kind established to address wildlife crime. Staffed by experienced criminal intelligence officers and analysts and retired wildlife crime police officers, this centre provides a one-stop shop for police seeking intelligence, investigation and crime scene support for wildlife crime offences (UNODC, 2021).

Training and expertise

Inadequate and inconsistent training on investigating wildlife crimes constrains enforcement capabilities. Most officers are uniformed police rather than specially trained detectives [high confidence] (Nurse, 2012; UNODC, 2021). No unified training approach exists, relying on ad hoc courses or retired professionals [high confidence] (Nurse, 2012, 2020; UNODC, 2021). Recruit training excludes wildlife crimes altogether [medium confidence] (UNODC, 2021), while trained wildlife officers get minimal hands-on investigative experience before being reassigned [high confidence] (Nurse, 2012; UNODC, 2021). Though dedicated, uniformed officers often need more opportunities to develop advanced detective techniques, hone skills through varied investigations and develop their expertise in policing wildlife crime

that serious wildlife crimes require [high confidence] (Nurse, 2012, 2020; Tingay, 2015).

Not a serious crime

Wildlife crimes are frequently not regarded as severe offences warranting priority, hindering enforcement. Senior officers downplay these cases, with part-time or reactive policing dependent on NGOs rather than proactive investigations by skilled detectives [high confidence] (Wellsmith, 2011; Nurse, 2012, 2020; Tingay, 2015; UNODC, 2021; National Wildlife Crime Unit, 2022a). Despite the publicity, wildlife crimes are marginalised as priorities in mainstream justice systems [high confidence] (Nurse, 2012, 2020; UNODC, 2021). Exceptions like Operation Easter[7] show focused intelligence efforts can deliver results, yet are not the norm [low confidence] (Scottish Environment LINK, 2015). Wildlife crime lacks definition as 'serious' or 'organised' crime, preventing the use of advanced investigative techniques [medium confidence] (UNODC, 2021). Wildlife crimes rank below other violent crimes, which demand more immediate attention [medium confidence] (Nurse, 2012). Treating wildlife offences as unimportant can undermine effective enforcement.

Summary

Limited funding, training deficiencies and low prioritisation hinder the effective policing of wildlife crime in Scotland by creating a low-risk environment for wildlife crime. Chronic under-resourcing forces a reactive approach when proactive expert investigation is needed [medium confidence]. Inconsistent training fails to develop enduring enforcement expertise [high confidence] and a culture that acknowledges the seriousness of wildlife offences [high confidence]. While violent crimes understandably require urgent attention, disregarding wildlife crimes as unworthy of skilled policing enables persistence [high confidence]. Each challenge builds on the others in a reinforcing cycle – lack of funding prevents training and proactive units,

[7] Operation Easter targets egg thieves by sharing intelligence across the UK to support enforcement action.

undermining severe treatment and encouraging potential offenders [medium confidence].

Court-related challenges undermine wildlife crime justice

Inconsistent and lenient sentencing

Inconsistent sentencing undermines deterrence. With no sentencing guidelines yet for wildlife crime across the UK, sentencing often does not adequately reflect the nature and impact of the crime and is erratic. Wildlife crime is a low priority and magistrates place more importance on the illegal economic gain than on the conservation impact of the crime [medium confidence] (St John, Edwards-Jones and Jones, 2012). They must also judge a criminal's ability to pay a fine and consider reducing sanctions in response to offender mitigation (such as a timely guilty plea) [high confidence] (St John, Edwards-Jones and Jones, 2012; UNODC, 2021). As a result, sentences frequently fall at the lower end of available ranges [high confidence] (Nurse, 2011, 2012; Tingay, 2015; Lavorgna et al., 2020; UNODC, 2021; National Wildlife Crime Unit, 2022a). Inconsistency and leniency can enable persistence.

Prosecutorial constraints

Prosecutors face resourcing and training deficits [medium confidence] (Tingay, 2015; UNODC, 2021). Securing convictions requires substantial effort and expert testimony, but sentences often do not justify costs [high confidence] (St John, Edwards-Jones and Jones, 2012; UNODC, 2021). Frustration emerges when cases get discarded as not in the public interest over factors like first offences, despite significant investigative investments [high confidence] (Nurse, 2012; UNODC, 2021).

Lack of transparency and oversight

Poor transparency around prosecutorial decision-making and case outcomes breeds stakeholder mistrust [medium confidence] (Scottish Environment LINK, 2015; Bat Conservation Trust, 2017). Forensic labs are often uninformed of prosecution results

[medium confidence] (Millins et al., 2014). Inadequate communication between authorities and partners during investigations is another issue [medium confidence] (Scottish Environment LINK, 2015; Tingay, 2015; RSPB, 2021). Unclear reasoning around declined prosecutions diminishes confidence in the process [medium confidence] (Scottish Environment LINK, 2015; Tingay, 2015; RSPB, 2021).

Summary

Overall, inconsistent sentencing [high confidence], constraints around prosecution [high confidence] and a lack of transparency [medium confidence] impede justice and reinforce perceptions of wildlife crime as low risk.

Issues in the legislature

Legislative gaps and complexities may enable wildlife crimes in Scotland. Wildlife protection laws are fragmented across multiple statutes intended for conservation management rather than criminal justice [high confidence] (Nurse, 2012; Scottish Environment LINK, 2021; UNODC, 2021). There are disparities between Scotland's approach and England, Wales and Northern Ireland [high confidence] (Nurse, 2012; UNODC, 2021). Deficiencies exist around penalties, species coverage, rest sites and landowner liability [high confidence] (Tingay, 2015; Scottish Environment LINK, 2021; UNODC, 2021). Complex regulations like CITES permits need better public compliance [high confidence] (Lavorgna et al., 2020; UNODC, 2021). In practice, legislative complexity and varied standards across the UK reinforce notions of wildlife crime as an issue of low priority. However, analysis suggests that enforcement limitations outweigh legislative ones as the primary obstacle [high confidence] (Nurse, 2012, 2020).

Lack of data constrains understanding and responses

The true scale is unknown

Significant knowledge gaps exist regarding the accurate scale and nature of wildlife crimes due to inconsistent data, under-reporting of crimes, and a lack of research.

Some wildlife groups, such as herpetofauna or pearl mussels, receive scant attention in the literature where intentions to analyse crime drivers in these groups are stated, but not delivered [highest confidence] (Cosgrove et al., 2016; Raynor, 2018). Meanwhile, the evidence base should include the socio-economic effects of grouse moor management [highest confidence] (Thompson, McMorran and Glass, 2018; Thompson et al., 2020). Detected incidents of crime likely represent a fraction of actual offences, but the extent of this 'dark figure' is uncertain [highest confidence] (Cosgrove, Hastie and Sime, 2012; Scottish Environment LINK, 2015; Tingay, 2015; Murgatroyd et al., 2019; Lavorgna et al., 2020; RSPB, 2021; UNODC, 2021; Wildlife and Countryside and Link, 2021). For example, there are significant discrepancies in the number of recorded incidents by NGOs compared with the Scottish Government's wildlife crime reports [high confidence] (Bat Conservation Trust, 2017; RSPB, 2021; Scottish Government Environment and Forestry Directorate, 2021). This obscures the severity of these crimes, risking downplayed enforcement and judicial responses [high confidence] (Nurse, 2012; Tingay, 2015; Scottish Environment LINK, 2021).

Data limitations across sources

Fragmented data ownership and collection processes provide an incomplete picture of wildlife offences [high confidence] (Lavorgna et al., 2020; UNODC, 2021). Most crimes are not notifiable or recordable offences [high confidence] (Nurse, 2012; Lavorgna et al., 2020; UNODC, 2021; Ewing et al., 2023). Data lacks granularity, agency comparability, and proactive, in-depth analysis [high confidence] (Lavorgna et al., 2020; UNODC, 2021). Systemic detection, recording, prosecution and sentencing limitations obstruct robust quantification [high confidence] (Nurse, 2012, 2020; Tingay, 2015; UNODC, 2021; National Wildlife Crime Unit, 2022a).

Impacts on responses

Limited data on the nature and scale of wildlife crimes constrains evidence-based solutions and resourcing [high confidence] (Nurse, 2011, 2020; Tingay, 2015; UNODC, 2021). Significant intelligence gaps remain around offences [high confidence] (UNODC, 2021; National Wildlife Crime Unit, 2022a). Implementing

standardised, mandatory recording and data sharing, alongside more proactive analysis, could help inform targeted policies and enforcement [high confidence] (Tingay, 2015; UNODC, 2021; National Wildlife Crime Unit, 2022a). But, presently, lack of data can enable persistence by obscuring solutions [high confidence].

Summary

In summary, systemic data limitations allow wildlife crimes in Scotland to continue to be obscured, enabling persistence. Major uncertainties exist around the true scale and nature of wildlife crimes in Scotland due to systemic data limitations [highest confidence]. Many offences go undetected and unrecorded, obscuring the full dark figure of crimes committed [highest confidence]. Fragmented data collection and ownership processes provide an incomplete picture across agencies [high confidence]. Data lacks granularity and comparability [high confidence]. With the nature and prevalence of many offences unclear, targeted responses are hampered [high confidence]. Implementing standardised mandatory recording and data-sharing could inform policies and enforcement (high confidence).

Genuine problems and biases enable conflicts

Some wildlife pose tangible problems that spur persecution. Adders are killed over bite risks [medium confidence] (National Wildlife Crime Unit, 2022a), while raptors limit gamebird populations central to rural economies [high confidence] (Francksen et al., 2019). Distinguishing cultivated plants from wild-sourced specimens creates enforcement challenges [medium confidence] (Lavorgna et al., 2020). Data and policies focus disproportionately on certain groups like raptors, neglecting widespread plant trafficking [high confidence] (Lavorgna et al., 2020; Lavorgna and Sajeva, 2021; Whitehead et al., 2021). This overlooks threats to plants and less charismatic species. Such genuine conflicts and taxonomic biases emphasising charismatic fauna over flora and invertebrates drive wildlife crimes [medium confidence].

Divergent perspectives around land use drive wildlife crime

Competing values and interests

At the heart of wildlife crime are competing values and perspectives among stakeholders like landowners, conservationists and officials. For instance, some view landscapes as resources for traditional pursuits like hunting, while others prioritise nature conservation [highest confidence] (Alexander, 2016; Coz and Young, 2020). Reintroduced predators ignite conflicts as symbols of competing interests around land use [highest confidence] (Hodgson et al., 2018; Staddon, 2021; Bavin et al., 2023). Positions become entrenched, with each side depicting divergent narratives aligning with their goals — progress stalls as stakeholders dismiss each other's arguments [highest confidence] (Redpath et al., 2013; Hodgson et al., 2018; Newton, 2021). Ultimately, wildlife like raptors become proxies for more profound clashes over land use vision between sporting and conservation interests.

Legacy of divergent land use perspectives

Scotland's history of concentrated private estates amongst elites fuels modern tensions around land use. Large areas of Scotland are controlled by relatively few elite owners, who bought vast private estates in the 18th and 19th centuries due to the 'Highland Clearances' [highest confidence] (MacMillan et al., 2010; Glenn et al., 2019; Staddon, 2021). This can disadvantage specific local communities with limited control over land use decisions, particularly regarding housing options or land used for conservation interests [medium confidence] (Glenn et al., 2019). In extreme cases, fears of reprisal for disagreeing with landowners endure in some areas [medium confidence] (Glenn et al., 2019). This history fuels ongoing clashes between sporting, local and conservation interests. As a result, rebuilding trust between farmers, ecologists and other stakeholders remains challenging due to lingering animosity [highest confidence] (Redpath et al., 2013; Kirkland et al., 2021; Staddon, 2021; Bavin et al., 2023). Overall, the legacy of divergent land use visions continues to shape modern disagreements underlying wildlife conflicts [high confidence].

Indirect drivers conclusion

Deficiencies across the criminal justice system [high confidence], legislation [high confidence] and data collection [highest confidence] position wildlife crime as an attractive prospect with minimal risks. Limited funding prevents proper investigation training and units [medium confidence], while inconsistent sentencing [high confidence], legal gaps [high confidence] and opaque prosecution practices [medium confidence] hamper deterrence. Fragmented data collection allows the true scale of crimes to remain obscured [highest confidence], which impacts the ability of the criminal justice system to arrest, prosecute and sentence [high confidence]. Genuine human-wildlife conflicts enable some offences, but biased priorities overlooking plant crimes and invertebrates allow continuation (high confidence). Meanwhile, competing land use visions rooted in Scotland's history continue fuelling modern wildlife conflicts (high confidence). In this enabling environment, offenders can reasonably anticipate evading detection while facing unclear, but likely lenient, outcomes if caught.

The interplay between direct and indirect drivers

The persistence of wildlife crime in Scotland stems from the interplay between varied direct motivations of offenders and systemic enabling conditions that shape the risks versus rewards of these offences. On the one hand, individual-level drivers include economic incentives, entertainment motivations, cultural factors, attitudes towards animals and more. Financial gains, hobby interests, rural traditions and perceptions of animals all provide direct reasons for committing crimes. Any solutions must address these reasons offenders are compelled to commit wildlife crimes.

However, these motivations do not exist in isolation. Broad societal conditions also facilitate the continuation of wildlife offences by making them low-risk prospects. Dynamics around detection avoidance, weak deterrence, law enforcement deficiencies, legislative loopholes and lack of data coalesce to position these crimes as attractive opportunities with minimal downsides.

Direct drivers provide the intent, while indirect drivers provide the means. Offender motivations supply the rationale to pursue crimes, from profit-driven persecution of economically threatening species, to thrills and status gained from coursing. But factors like opaque online trafficking networks, under-resourced enforcement agencies, and lenient sentencing enable the realisation of motivations in action by lowering risks.

4. Discussion

Summary of evidence

In conclusion, this review finds that varied individual motivations alongside systemic enabling factors reinforce each other to facilitate wildlife crime in Scotland. On the individual level, predominant drivers range from profit incentives to entertainment and cultural motivations. However, dynamics across law enforcement, the judicial system, legislation, and data collection also critically position these crimes as low-risk prospects with high rewards. This author feels that reducing Scotland's wildlife crime rates will require dual attention to both sides of this equation through deterring intent and reshaping the societal conditions that allow offences to be carried out with minimal consequences. With comprehensive efforts addressing direct motivations and indirect enabling factors, the dynamics perpetuating wildlife crime could be transformed over time. These could include education, alternative economic options and further regulation. However, sustainable progress relies on recognising that these offences stem not just from individual reasons, but also from an enabling environment across society. This perhaps requires reforms to legislation, enforcement practices, judicial procedures and data collection protocols. The evidence suggests that holistic solutions addressing the full extent of what compels and enables perpetrators will allow Scotland to combat wildlife crime effectively.

Limitations

The study limitations identified include those discussed as follows.

Additional review

This report would have benefited from the involvement of one or more additional reviewers to compare with the original reviewer's source identification and screening, data charting, thematic analysis and confidence assessments.

Publication date range

The inclusion criteria cover literature published between 2010 and 2023. This timeframe might miss earlier seminal studies that could offer important insights into the historical context of wildlife crime drivers. Additionally, the evolution and emergence of drivers over time were not assessed.

Academic literature

Specific limitations relate to the two academic databases used (Scopus and the Web of Science), which, although comprehensive, do not produce identical results as they draw from different libraries. However, these databases have reproducible results (Gusenbauer and Haddaway, 2020).

In addition, books were excluded from the analysis due to project constraints. However, this exclusion omitted valuable comprehensive and in-depth studies that delve into the drivers of wildlife crime. For example, it is common for academics in wildlife criminology to publish their materials in books rather than academic journals (e.g. Nurse and Wyatt, 2021). While it is a subjective opinion, the author of this report feels there is more substantial evidence for systemic drivers of crime in this material than has been presented in this review.

Non-academic literature

Another limitation relates to using Google, Google Scholar and snowball sampling for non-academic literature. These databases do not produce identical results for repeated identical queries like Scopus or Web of Science (Gusenbauer and Haddaway, 2020). As a result, the results for non-academics are captured through a more subjective process than evidence identified using Boolean search terms in other databases. While, in the absence of other formal databases, Google Scholar is considered suitable for systematic reviews seeking to find secondary literature (Haddaway et al., 2015), its need for more transparency and reproducibility should be noted.

Direct drivers analysis

The typology used to categorise direct drivers of wildlife crime is based on Nurse (2011), which might not account for emerging drivers that have evolved since the publication of this research. While this typology comes from only one document discussing wildlife crime at the UK level, it comes from an established academic who leads research in this field.

The quantification of direct drivers ignores the literature item's quality, level of detail and context-dependency. Confidence assessments were ignored for aspects of the analysis. This caveat should be noted when interpreting the results of the direct drivers of wildlife crime in Scotland. This is different from other sections detailed in the report.

Indirect drivers analysis

Much of the literature identifying systematic underlying drivers of wildlife crime in Scotland is sourced from literature written at the UK scale. This is particularly the case for aspects discussing policing and the courts. The sources used at this point are strong evidence, either from published academics or UN reports. In addition, Scotland is explicitly discussed in these incidents; however, the UK-wide scale of these reports potentially limits their application to Scotland.

Expert consultation

While some expert consultation was sought, it needed to be more comprehensive. Further expert consultation, particularly with shooting and gamekeeping stakeholders, would have been desirable during the establishment and refinement of search terms.

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Appendices

Appendix A

Species Group	Protection
Amphibians	Amphibians, such as frogs, toads, and newts, can be targeted through habitat destruction, collection for the pet trade, or persecution. Some species receive protection under the Wildlife and Countryside Act 1981 or other legislation.
Badgers	Scotland's badgers are the most protected badgers in the UK. Through changes to the law in 2004 & 2011, a much wider culpability was introduced. You can view a full copy of The Protection of Badgers Act. The law specifies that it is an offence to: • kill, injure, take, possess or cruelly ill-treat a badger • interfere with a sett by damaging or destroying it • obstruct access to, or any entrance of, a badger sett • disturb a badger whilst it is occupying a sett • cause a dog to enter a sett • possess, sell or offer for sale a live badger • be in possession or control of a dead badger or anything derived from a dead badger The 1973 Badgers Act gave limited protection but allowed landowners to continue to kill badgers. Through the 1980's various legal protections were added but were ineffectual, resulting in the Protection of Badgers Act 1992, which outlaws interfering with the sett of a badger and thereby allows law enforcement authorities to more effectively investigate badger crime.

Beavers	Beavers were once extinct in Scotland but have been reintroduced. They are now a protected species under the Conservation (Natural Habitats, &c.) Regulations 1994. It is an offense to kill, capture, or disturb them or destroy their habitats without a license.
Birds	Various bird species, including songbirds and game birds, may be targeted through activities like illegal trapping, shooting and disturbance. They receive partial to full protection under the Wildlife and Countryside Act 1981.
Bats	Bats are often subjected to persecution, disturbance, and destruction of their roosts. They receive full protection under the Wildlife and Countryside Act 1981.
CITES Species	CITES-listed species, such as African elephants, rhinoceroses and tigers, are protected under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The trade and possession of these species or their parts is strictly regulated and requires permits. The EU has implemented CITES in the Wildlife Trade Regulations (EC338/97). The regulation lists species in a series of Annexes (A,B and C) which broadly correspond to CITES Appendices I, II and III. The Control of Trade in Endangered Species (Enforcement) Regulations 1997 (COTES) established a series of offences and penalties for infringements of the EU Wildlife Trade Regulations within the UK.
Deer	Deer species, including red deer and roe deer, may be targeted through illegal hunting, poaching, or disturbing their habitats. They receive partial to full protection under the Deer (Scotland) Act 1996 and other legislation.

Freshwater Fish	Freshwater fish, such as salmon, trout and eels, can be targeted through illegal fishing practices. They receive full protection under the Wildlife and Countryside Act 1981.
Hares	Hares, such as the mountain hare, may face illegal hunting and poaching. They receive partial protection under the Wildlife and Countryside Act 1981.
Invertebrates	Invertebrates, such as certain butterfly and beetle species, can be targeted by illegal collecting, habitat destruction or disturbance. Some species may receive protection under the Wildlife and Countryside Act 1981 or other legislation.
Marine Species	Marine species, including seals, dolphins and whales, face threats such as illegal hunting, bycatch and disturbance. They receive full protection under various legislation and international agreements.
Molluscs	Molluscs, including certain snail and bivalves such as freshwater pearl mussels, may be targeted through illegal collection or trade. Some species receive protection under the Wildlife and Countryside Act 1981 or other legislation.
Pine Martens	Pine martens, a native species in Scotland, may be targeted through illegal trapping and persecution. They receive partial protection under the Wildlife and Countryside Act 1981.
Plants	Various plant species, including orchids, sundews and certain tree species, can be targeted through illegal collection, uprooting, or destruction of habitats. Some species receive protection under the Wildlife and Countryside Act 1981 or other legislation.
Raptors	Raptors, such as golden eagles, peregrine falcons and red kites, are targeted by illegal activities like poisoning, trapping, and nest

	destruction. They receive full protection under the Wildlife and Countryside Act 1981.
Reptiles	Reptiles, including snakes, lizards and turtles, can be targeted through habitat destruction, collection for the pet trade, or persecution. Some species receive protection under the Wildlife and Countryside Act 1981 or other legislation.
Squirrels	Squirrels, including the red squirrel, may face threats from the non-native grey squirrel and habitat loss. They receive partial protection under the Wildlife and Countryside Act 1981.
Wildcat	Wildcats, also known as Scottish wildcats, are critically endangered and face threats such as hybridisation with domestic cats, and habitat loss. They receive protection under the Wildlife and Countryside Act 1981 and the Scottish Wildcat Conservation Action Plan.

Table 3. A detailed list of species protected under law.

Appendix B

Section	Item	PRISMA-ScR checklist item
Title	1	Identify the report as a scoping review.
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results and conclusions that relate to the review questions and objectives.
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g. population or participants, concepts, and context) or other relevant key elements used to conceptualise the review questions and/or objectives.
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g. a web address); and, if available, provide registration information, including the registration number.
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g. years considered, language, and publication status) and provide a rationale.
Information sources*	7	Describe all information sources in the search (e.g. databases with dates of coverage and contact with

		authors to identify additional sources) as well as the date the most recent search was executed.
Search	8	Present the full electronic search strategy for at least one database, including any limits used, such that it could be repeated.
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e. screening and eligibility) included in the scoping review.
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g. calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.
Data items	11	List and define all variables for which data is sought and any assumptions and simplifications made.
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).
Synthesis of results	13	Describe the methods of handling and summarising the data that is charted.
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.

Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data is charted and provide the citations.
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that is charted that relate to the review questions and objectives.
Synthesis of results	18	Summarise and/or present the charting results as they relate to the review questions and objectives.
Summary of evidence	19	Summarise the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives and consider the relevance to key groups.
Limitations	20	Discuss the limitations of the scoping review process.
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.

Table 4. The PRISMA Systematic Review Checklist from Page et al. (2021).

Appendix C

bird OR crustacean OR insect OR amphibian OR reptile OR invertebrate OR mammal OR badger OR beaver OR wildcat OR “pine marten” OR “red squirrel” OR raptor OR bird OR eagle OR buzzard OR harrier OR predator OR kestrel OR bat OR fish OR fox OR kite OR hawk OR owl OR falcon OR salmon OR trout OR eel OR elver OR seal OR hare OR frog OR toad OR snake OR plant OR fungi OR flower OR dog OR deer OR egg OR animal OR wildlife OR “wild animal” OR creature* OR sett OR roost OR nest) AND (cull* OR bait* OR unlawful OR destruction OR offence OR crime* OR hunt* OR persecut* OR thieve* OR thieving OR theft OR damage* OR destroy* OR poison* OR poisoning OR injure* OR injuring OR harm* OR poach* OR fish OR trade* OR trading OR possess* OR snare* OR kill* OR collect* OR coursing OR take* OR taking OR trap* OR exploit* OR conflict* OR “conservation conflict*” OR illegal OR criminal) AND (scotland))

Appendix D

Study Information						Study Design and Methodology				
Author(s)	Title	Year	Source	DOI	ISBN	Design	Collection Methods	Sample size	Sampling method	Geographic location(s)
Lavorgna,	CITES	2018	journal	10.1(	n/a	review	literature re	70,000	web crawl	Global

Wildlife Crime Types			Legislative Framework	Data on Wildlife Crime Incident		
Types of crime	Affected wildlife	Key issues related to crime	Relevant laws, regulations, policies	No. of reported incidents	Time period covered	Geographic distribution
endangered pla	plant	illegal tradi	CITES	A 2016 survey of 8(	n/a	n/a

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