Protocols of Expert–AI Scientific Inquiry

War-Affected Soils and the Imitation of Knowledge: A Critical Analysis of O. A. Gordienko's "Impact of War on Soils" in Eurasian Soil Science

Protocol of Critical Case Analysis and Open Scientific Deliberation

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Status and purpose of the protocol

This protocol preserves a detailed critical inquiry into O. A. Gordienko's Impact of War on Soils (a Review), published in Eurasian Soil Science in 2025. Its principal conclusion is that the reviewed publication imitates the form of a scientific review without adequately carrying out the intellectual operations that would produce review knowledge. Definition of the object, verification, source comparison and synthesis are insufficient, yet publication supplies the appearance that knowledge has been produced. The source mismatch is a particularly checkable diagnostic example within this wider pattern. The inquiry examines soil construction, geographical and bibliographic selection, synthesis, translation and institutional recognition together.

The publication form is an analytical protocol with a complete case dossier. It is neither a verbatim transcript nor a conventional review article. Questions, alternative explanations, decisions about interpretation, evidentiary limits, and unresolved issues are recorded alongside the detailed analysis. Open deliberation here means that the reasoning is available for inspection and challenge. It does not imply that an undocumented laboratory meeting took place or that named participants made reconstructed statements.

The eleven analytical blocks of the earlier manuscript are retained in full substance. The protocol does not replace them with the conference presentation or with a short summary. The presentation and the earlier published conference record are related outputs of the same investigation, not independent corroboration of its conclusions. This document closes the current analytical stage while leaving the record open to documented corrections, new evidence, and responses from the author or publishing institutions.

Language and record of the inquiry

The present editorial discussion was conducted in Russian. The detailed manuscript and supplied conference slides are in English. This publication protocol retains English as the language of the analytical dossier. Questions introduced during the present revision are translated into English without inventing earlier dialogue, votes, a meeting date, or an attendance list.

The supplied manuscript describes an earlier expert–AI workflow in which an expert had identified the problem over approximately three months and assembled an analysis with AI assistance in one working day. That account is retained as an author-reported history. It is not independently established by the present editorial record. The current protocol distinguishes that earlier inquiry from the document-based revision completed on 12 October 2026.

Abstract

This protocol documents a critical case analysis of Gordienko's 2025 review Impact of War on Soils. The principal conclusion is that a low-quality compilation can acquire the institutional status of knowledge by reproducing the external form of a scientific publication while failing to perform the verification, differentiation, comparison and synthesis required of its declared genre. The initial question is how the publication system recognizes and disseminates such an imitation as a contribution to knowledge. A figure of 121,406 km² and 0.024 percent of Earth is examined against a source about the United States Department of Defense's real-estate portfolio. Arithmetic reconstruction shows that converting 30 million acres produces the published area, but does not validate its reinterpretation as global war-affected soil. The complete dossier examines soil definitions, named soil categories, Ukraine's representation, bibliographic selection, contemporary Russian territory, synthesis, genre, scholarly certification, translation, and AI disclosure. The protocol records competing explanations and distinguishes public evidence from interpretations and earlier audit findings requiring reproducible confirmation. It treats narrative reviews as a legitimate genre and does not equate the absence of a systematic-review checklist with invalidity. The full pattern supports the analytical classification of this text as imitation of review knowledge and identifies successful publication of that imitation as the main institutional problem. The citation error is evidence within the case, not its whole conclusion. This classification does not imply proof of deliberate deception or establish private reviewer conduct or prevalence across publishing. A case-specific bibliography and an explicit closure decision accompany the full analysis.

Keywords: war-affected soils; critical case protocol; source verification; narrative reviews; bibliographic selection; Ukraine; scholarly certification; expert–AI inquiry

Main question and development of the problem

The main question is: how can a text that reproduces the appearance of a scientific review, while inadequately defining its object, verifying its evidence, comparing sources and synthesizing findings, be published and recognized as if those knowledge-producing operations had been completed?

The supplied presentation records that the article was recommended during conference preparations. The initial reaction was a judgment of poor scholarship. The inquiry developed beyond that judgment by asking what the number measured, what the cited source said, which soils were differentiated, whose evidence represented affected territories, and what synthesis

the review produced. The citation defect was treated as a starting point rather than as the endpoint. The case therefore developed from an assessment of one text into an examination of the relationship between verification and institutional recognition.

The working concept of imitation of knowledge denotes a published arrangement of scholarly signals without sufficiently demonstrated corresponding operations. It is an analytical description of a possible outcome, not a finding of fraud, intentional deception, or coordinated misconduct. Organized non-verification is used in the same conditional institutional sense: verification can become ineffective across a division of labour without any agreement to suppress it.

Materials and evidence status

The core materials are the supplied long-form analytical manuscript, the sixteen-slide conference presentation, Gordienko's publisher record and reference list, the Military Times source identified as reference 59, and the two linked Pollution and Diseases publications. The earlier protocol at article 96 supplies a model for preserving an inquiry rather than a model for reproducing its conclusions. Its DOI identifies that earlier work and is not the DOI of this protocol.

Directly checked public items include the target article's title and DOI, its published abstract, the numbered bibliography, references 2, 11 and 59, the journal's stated Scopus coverage, and the translation and AI notices. The full paywalled target text was not independently retrieved during this revision. Main-text quotations, the six-category count, claims about citation placement, and close readings of the conclusion remain findings of the supplied earlier audit. They are retained transparently as such, rather than redescribed as a new independent full-text audit.

For reproducibility, the publication record should retain the exact English version examined by the original analyst and a location ledger for each quoted passage, soil category and citation. The ledger should distinguish running text from reference titles and classify inclusion by evidentiary role rather than by an author's surname. A finding of one identifiable Ukrainian soil-science-journal reference is narrower than a claim that only one Ukrainian person or affiliation occurs anywhere in the bibliography.

Editorial records, private correspondence, review reports and the source-language manuscript are not part of the evidence assembled here. The published outcome permits the statement that the source mismatch survived the publication process. It does not establish which person noticed it, whether it was discussed, or whether a reviewer opened a source. Recommendations of the article are an expert-reported context unless the underlying correspondence is separately archived.

Arithmetic reconstruction and its limits

Using the international-acre conversion, 30,000,000 acres × 0.0040468564224 km² per acre = 121,405.692672 km², which rounds to 121,406 km² [R2, R4].

121,406 ÷ 510,000,000 × 100 = 0.0238051 percent, approximately 0.024 percent. Using a rounded land-area denominator of 149,000,000 km² would yield approximately 0.08148 percent. These denominators are explanatory approximations; neither calculation is a new estimate of damaged soil.

This match reconstructs a plausible arithmetic route. It does not document the author's actual calculation history. The decisive point is source–claim correspondence. A military real-estate inventory cannot establish the global area of soil changed by war. The Military Times account also uses both nearly 30 million acres and a 26.9-million-acre figure. These should not be silently conflated. The approximate input cannot support environmental precision to the nearest square kilometre. Substituting a land-only denominator would leave the invalid numerator unchanged.

Alternative explanations and decisions

Is the central discrepancy merely a unit-conversion error? Rejected: the reconstructed conversion is arithmetically consistent. The problem is category substitution.

Could all military land be treated as land affected by war? Rejected as a definition for the global soil claim: administrative possession, training use, combat exposure and measured soil transformation have different inclusion criteria. Their overlap does not make their total areas interchangeable.

Could translation have introduced or intensified the wording? Left open: the Russian original and English version have not been compared here. This possibility affects the attribution of the error, not the lack of support for the claim in the published English record.

Does absence of systematic-review reporting alone invalidate the article? Rejected: a narrative review is a legitimate form. The relevant questions are source fidelity, transparent scope and selection, scientific reasoning and synthesis. SANRA provides a methodological comparison from medicine, not a validated soil-science score applied in this protocol. PRISMA concerns reporting systematic reviews and is not imposed on every review [R10, R11].

Does one case establish misconduct throughout a journal, national discipline or database? Rejected: no prevalence study or evidence of coordination has been produced. The case supports criticism of a published outcome and an institutional mechanism hypothesis.

Does a need to represent Ukrainian evidence mean accepting it uncritically? Rejected: relevant Ukrainian and international studies must be assessed by the same standards of source quality and comparability. Their exclusion requires a scope-based explanation; nationality alone establishes neither truth nor unreliability.

Navigation through the complete analytical record

1 Thematic recognition without critical evaluation

2 A figure that changed its meaning

3 Soil without soils

4 Ukraine as damaged territory without Ukrainian knowledge

5 Bibliography as an epistemic border

6 A war that stops at the border

7 A review without review conclusions

8 The genre mismatch

9 How imitation of knowledge becomes published knowledge

10 Translation AI disclosure and responsibility

11 Conclusions and the minimum standard

The complete record follows. At the start of each block, the discussion question and evidence decision make the protocol's reasoning explicit. The original argument is retained with local corrections of unsupported certainty and publication terminology.

Earlier expert AI workflow and introduction

The supplied earlier case study is attributed to the Laboratory and was produced by the Laboratory of Military Ecotones through an expert-AI research workflow. The initiating expert had identified the article's principal problems and intended to prepare a critical analysis for approximately three months. Constraints of time, concentration, and sustained drafting prevented completion. With AI assistance, the analysis was developed and assembled in one working day. The AI did not determine the research problem or replace subject expertise. The expert defined the questions, supplied the political and disciplinary context, selected the claims requiring examination, evaluated the interpretations, and retained authority to approve the final argument. AI assisted with textual comparison, reconstruction of claims, organization of evidence, consistency checks, and drafting. The Laboratory retains responsibility for the final text.

The relevant comparison is therefore between an expert working alone, theoretically capable of completing the analysis but unable to do so under ordinary constraints, and an expert-AI system that made the investigation practically achievable. AI can be used to produce superficial academic text, but it can also reduce the cost of verification and post-publication criticism. Its contribution depends on the research system in which it is used and on whether accountable expert judgment remains decisive.

Introduction

A scientific publication begins as a material arrangement of words, numbers, citations, headings, tables, punctuation marks, and conventional declarations. None of these elements is knowledge by itself. A sentence does not become true because it is grammatically complete. A number does not become evidence because it is printed with several significant digits. A citation does not validate a claim merely because a reference number appears after it. A bibliography does not demonstrate engagement with the literature simply because it is long. Nor does the formal designation "review article" establish that a review has actually been conducted.

Nevertheless, once these elements are assembled in an academically recognizable form, they can begin to acquire the appearance of knowledge. The manuscript receives a title, an abstract, keywords, an introduction, thematic sections, a conclusion, acknowledgements, declarations of funding and conflicts of interest, and a numbered bibliography. It is submitted to a journal, processed through an editorial system, accepted, translated or edited, assigned a DOI, placed within a volume and issue, and incorporated into bibliographic databases. The result is no longer encountered as an unsupported text. It is encountered as a scientific article. This transformation is not merely typographical. It is institutional.

The published article carries the accumulated authority of the institutions through which it has passed. The author's name signifies responsibility for the argument. The journal title signifies disciplinary location. Peer review signifies prior examination. Editorial acceptance signifies

conformity with scientific and professional standards. The publisher signifies organizational continuity and public accountability. The DOI signifies permanence and citability. Bibliographic indexing signifies recognition within the formal infrastructure of science. Subsequent citations signify that other researchers have found the work relevant enough to incorporate into their own accounts.

Each signal is meaningful. Modern science could not function without distributed trust in authors, reviewers, editors, journals, publishers, databases, and readers. No researcher can personally repeat every experiment, inspect every archive, verify every calculation, or read every source underlying every statement used in a new study. Scientific communication therefore depends on delegated verification. Authors are expected to have checked their evidence. Reviewers are expected to have challenged unsupported or incoherent claims. Editors are expected to have determined whether the manuscript belongs in the journal and whether it meets the elementary requirements of its genre. Readers are entitled to begin from the assumption that obvious failures have already been detected.

Yet this system contains a structural vulnerability. The signs that normally indicate the production of knowledge can also circulate independently of the practices they are supposed to represent. A citation can exist without source verification. A review can exist without a defined search strategy, corpus, method of comparison, or assessment of evidence quality. A scientific object can appear in the title without being operationally defined in the article. A conclusion can summarize general statements without producing conclusions about the literature. Peer review can be completed procedurally without identifying defects that are visible in the published text. Indexing can record the existence of a publication without independently testing the truth of its claims. Under these conditions, the formal signs of scientific knowledge remain present while the investigative operations that should support them become partial, superficial, or absent. The publication system continues to operate. Manuscripts are received, reviewed, revised, accepted, translated, formatted, published, indexed, downloaded, and cited. Every administrative action can be successfully completed. Nevertheless, the epistemic function of the process—the production and validation of dependable knowledge—may fail.

The distinction between administrative completion and epistemic achievement is especially important in research on the environmental consequences of war. War-related soil degradation is frequently described as an insufficiently studied subject. The available literature is geographically uneven, methodologically fragmented, linguistically divided, and difficult to compare. Active war zones are dangerous and often inaccessible. Baseline measurements are commonly absent. Sampling may begin years after the original disturbance. Military records can be incomplete, inaccessible, classified, politically framed, or physically destroyed. Contaminants migrate and transform. Craters, trenches, destroyed industrial sites, burned landscapes, flooded mines, displaced sediments, unexploded ordnance, petroleum releases, metallic residues, and the products of explosive reactions form interacting rather than isolated processes.

Research in such a field requires particularly careful definitions, source criticism, geographical contextualization, and acknowledgment of uncertainty. Yet the perceived scarcity of publications can generate the opposite response. When a subject is considered neglected, the appearance of any publication devoted to it may be welcomed as progress. The fact that war-related soil damage has entered a journal title, abstract, or keyword list can be treated as evidence that the problem is finally receiving scientific attention. Thematic presence begins to

substitute for evidential quality. This substitution is dangerous. A neglected research field is not protected by weak standards. It is made more vulnerable by them.

In an established field, an erroneous estimate or inadequate review may be corrected by a large and internally differentiated literature. Competing datasets, methods, laboratories, national traditions, and theoretical approaches can expose the weakness of an individual publication. In an emerging or marginal field, there may be fewer corrective mechanisms. A single review can become a convenient introductory source. Its classifications can be repeated because no alternative synthesis is readily available. Its numerical claims can circulate because they appear to provide rare quantitative certainty. Its bibliography can shape which regions, languages, institutions, and researchers are recognized as belonging to the field. A weak publication can therefore influence the architecture of subsequent research precisely because the relevant literature remains limited.

The present protocol examines this problem through a detailed analysis of O. A. Gordienko's "Impact of War on Soils (a Review)," published in Eurasian Soil Science in 2025. The journal belongs to the recognized infrastructure of professional soil science and is indexed in Scopus. The article possesses every visible characteristic normally associated with a legitimate scientific publication. It has an identified author and institutional affiliations, an abstract, keywords, a stated objective, thematic sections, a conclusion, 106 references, funding information, a conflict-of-interest declaration, a translation credit, a publisher's note, and a DOI. It is not an informal internet text, an unpublished lecture, a student essay, or a preliminary memorandum. It entered the public record as a scientific review.

For this reason, its weaknesses cannot be dismissed as the private limitations of an unfinished manuscript. Publication changed their status. Once the article was accepted and published, its statements became available for scientific reuse. Its estimates could be cited. Its representation of the literature could be treated as authoritative. Its omissions could shape the apparent boundaries of existing knowledge. Its vocabulary could influence how other researchers describe war-affected territories. The journal and the wider publication infrastructure did not merely distribute the text. They certified it as an admissible contribution to knowledge. The central question of this study is therefore not whether the article contains mistakes. All scientific publications can contain mistakes, and the existence of an error does not by itself demonstrate systemic failure. Nor is the purpose to speculate about the author's intentions, personal competence, political beliefs, or the circumstances under which the manuscript was prepared. Such speculation is unnecessary and would distract from the evidential problem. The object of analysis is the published text and the institutional status it acquired.

The more consequential question is how a text containing elementary, visible, and mutually reinforcing defects could pass through the mechanisms conventionally associated with scientific quality control without those defects becoming obstacles to publication. The case is important not because it demonstrates that one author can write a weak article. Weak manuscripts are an ordinary and unavoidable feature of academic production. The important fact is that the institutions expected to distinguish a preliminary compilation from a scientific review did not make that distinction consequential. The manuscript was successfully converted into a published, indexed, and citable object. This conversion requires analysis as a scientific and institutional process in its own right.

The following sections examine that process in detail. They trace the origin and transformation of the central numerical claim; reconstruct the article's unstable definitions of soil; assess the limited role of soil classification; analyse the representation of the war against Ukraine; audit

the national and institutional composition of the bibliography; examine the absence of contemporary effects within Russia; evaluate the article's conclusion against the functions of a scientific review; and determine the genre to which the text most plausibly belongs. The final purpose is not to compile a catalogue of errors or to produce a personalized accusation. It is to investigate how the appearance of scholarship can become institutionally equivalent to scholarship. The case demonstrates that formal publication systems may function smoothly while their epistemic purpose remains unfulfilled. A manuscript can be processed, accepted, translated, published, indexed, read, and cited even when the practices necessary to transform its statements into dependable knowledge remain incomplete. The fundamental problem can therefore be stated directly:

How does an arrangement of words, numbers, citations, punctuation marks, and standard academic sections become certified scientific knowledge when the text does not demonstrate that the underlying work of verification, comparison, criticism, and synthesis has actually been performed? This question extends beyond one article and one journal. It concerns the criteria by which expert communities recognize knowledge, the division of responsibility within scholarly publishing, and the particular vulnerability of research fields in which thematic urgency and scarcity of publications can protect weak work from critical examination. When academic institutions evaluate the signs of knowledge rather than the practices that produce it, the imitation of scholarship can become institutionally indistinguishable from scholarship itself.

Method and Scope of the Critical Case Study

This protocol preserves a close critical analysis of one published review article and of the sources necessary to test its central claims. The unit of analysis is the published English version of Impact of War on Soils, including its abstract, main text, conclusion, bibliography, translator credit, and publisher's notices. The study does not attempt a statistical evaluation of Eurasian Soil Science, Scopus-indexed journals, Russian soil science, or the wider literature on war-related contamination. The analysis applies six tests. First, it checks whether selected claims correspond to the objects described in their cited sources. Second, it examines whether soil is defined and differentiated as a scientific object. Third, it classifies the evidentiary functions of the bibliography and asks which expert communities and affected territories are represented. Fourth, it compares the article's treatment of Ukraine and Russia within the same ongoing war. Fifth, it evaluates whether the text performs the selection, comparison, quality assessment, and synthesis expected of a review. Sixth, it traces how editorial review, translation, publication, indexing, and later citation confer authority on the resulting text.

The numerical source error, the count of named soil taxa, and the bibliography are treated as directly inspectable evidence. Interpretations of omission, framing, genre, and institutional responsibility are analytical conclusions based on the published record. Where the record does not establish intent, private production history, or the exact actions of reviewers and editors, no such claim is made. The case can demonstrate that a failure passed through the publication system; it cannot establish how frequently comparable failures occur.

1 Thematic recognition without critical evaluation

Question for deliberation: Does the existence of a publication demonstrate that a neglected problem has been investigated adequately?

Evidence decision: The block distinguishes thematic visibility from evidential achievement. Recommendations of the target review are treated as reported context, while the adequacy of its reasoning is examined through the case.

The existence of publications on the environmental consequences of war should not be mistaken for evidence that those consequences are being adequately investigated. A research topic can be visible in journal titles, abstracts, keywords, conference programmes, bibliographies, and citation databases while remaining weakly constituted as an object of scientific inquiry. The number of texts devoted to a subject and the quality of knowledge produced by those texts are separate variables.

This distinction is particularly important in the study of war-related soil and water contamination. Researchers working in this area frequently begin from an accurate observation: compared with the scale, diversity, and duration of military impacts on the environment, the relevant scientific literature remains limited and fragmented. Many conflicts have received little systematic environmental investigation. Some territories cannot be safely accessed. Historical baselines are often unavailable. Environmental monitoring may stop during war precisely when the most consequential transformations begin. Military and industrial records may remain classified, incomplete, politically filtered, or physically destroyed. Research is distributed across soil science, hydrology, toxicology, geomorphology, public health, military geography, archaeology, remote sensing, mine action, agriculture, and environmental history.

The resulting field contains major geographical, chronological, disciplinary, and linguistic gaps. Recognition of these gaps is necessary. However, the recognition that a subject has been neglected can produce an unintended lowering of critical standards. When publications are scarce, a new article may be welcomed primarily because it exists. The fact that it mentions war, soils, pollution, military activity, or long-term environmental consequences is taken as evidence that the neglected problem is finally receiving scientific attention. Under these conditions, thematic relevance begins to substitute for scientific quality. The central evaluative question changes. Instead of asking whether a publication produces reliable knowledge, readers ask whether it addresses the correct subject. Instead of examining definitions, methods, sources, and conclusions, they register the appearance of war-related contamination in an academic publication as an inherently positive development. A text becomes valuable because of what it is nominally about, not because of what it has established.

This form of recognition is understandable. Researchers concerned with an insufficiently studied problem are often searching for colleagues, precedents, terminology, datasets, and institutional support. Every new article appears to enlarge the field. It can be added to a bibliography, cited in an introduction, shown to funders, included in a conference programme, or used to demonstrate that the subject has scientific legitimacy. In this context, criticism may appear counterproductive. A weak publication may still seem preferable to silence. But thematic scarcity does not transform inadequate research into adequate research. Nor does the importance of a topic compensate for the weakness of the methods used to investigate it.

The assumption that almost any publication on a neglected subject constitutes progress confuses recognition of the problem with knowledge of the problem. These are not equivalent achievements. A publication may correctly state that warfare damages soils while contributing little to the understanding of which soils are affected, through which mechanisms, over what spatial and temporal scales, with what degree of severity, on the basis of which observations, and with what implications for recovery, exposure, agriculture, ecosystems, or public health. The statement that war affects soil is not, by itself, a research result. It is a point of departure.

A scientifically useful study must transform this general proposition into an investigable object. It must specify what is meant by war, military activity, affected territory, soil damage, contamination, degradation, recovery, and long-term consequence. It must distinguish direct combat effects from military training, weapons production, storage, transport, disposal, demilitarization, reconstruction, and post-war land management. It must distinguish physical disturbance from morphological transformation, chemical contamination, biological damage, hydrological alteration, erosion, burial, compaction, and the redistribution of material.

It must also establish what type of evidence supports each claim. Evidence derived from field sampling is not interchangeable with a remote-sensing classification, archival description, military inventory, historical narrative, modelling exercise, newspaper report, institutional estimate, or visual observation. Each may be useful, but each has different limitations. Their conclusions cannot be combined simply because they refer to war and land. The category of "war-affected soil" is itself not self-evident. Does it include every soil located inside a political conflict zone? Only soil directly disturbed by combat? Soil contaminated by military substances? Agricultural land abandoned because of mines? Soil affected by fires caused by military action? Territory damaged by the destruction of industrial infrastructure? Land altered during post-war clearance and reconstruction? Military ranges used for training but never exposed to armed conflict? Areas affected by atmospheric or hydrological transport from distant military sources?

Different definitions produce radically different estimates of scale, severity, and duration. Without explicit criteria, almost any military presence can be described as an effect of war, while severe but indirect processes can remain outside the analysis. The apparent breadth of the subject then conceals conceptual indeterminacy. A high-quality publication on war-related soil contamination should therefore do more than accumulate examples. At a minimum, it should define its research object, identify its evidence base, explain how sources were selected, distinguish different mechanisms of impact, and state the limits of comparison. If it is a review, it should explain what literature was reviewed, how the corpus was constructed, which languages and databases were included, what time period and geography were covered, and how differences in method and evidence were handled.

It should also distinguish absence of evidence from evidence of absence. A territory may appear less affected because it has been studied less intensively. A contaminant may appear absent because it was not measured. A conflict may appear environmentally documented because a large number of descriptive publications exist, while the relevant soil processes remain unmeasured. Conversely, a small number of methodologically strong studies may produce more dependable knowledge than an extensive but derivative literature. These criteria become especially important when review articles are involved. A review article occupies a privileged position in scientific communication. Readers use reviews to enter unfamiliar fields, identify central concepts, find primary sources, understand areas of agreement and disagreement, and locate unresolved questions. A review can shape the perceived structure of an entire research area. Its selections determine which publications become visible. Its categories determine how findings are grouped. Its geographical language determines which territories and actors appear. Its conclusion determines what readers believe is already known and what still requires investigation.

A weak primary study may produce one unreliable result. A weak review can organize many readers' understanding of the field around unreliable relations. For this reason, review articles require more, not less, critical attention. Their authority cannot rest on the length of the bibliography or the breadth of the title. A review that claims to cover military impacts on soils

across historical periods and global conflicts assumes a substantial burden. It must demonstrate how heterogeneous materials have been made comparable. It must separate scientific research from illustrative historical sources, institutional reports, encyclopaedic materials, popular publications, and general web content. It must evaluate rather than merely reproduce quantitative claims. It must identify where the evidence is strong, where it is provisional, and where it is absent.

Thematic enthusiasm can prevent these questions from being asked. Readers who are pleased to see the subject represented may approach the article as an ally rather than as an evidential claim requiring examination. The text is cited to demonstrate that war-related soil damage exists, that the field is developing, or that a particular research agenda deserves support. Its presence in a recognized journal appears sufficient for these purposes. The article may consequently be used symbolically rather than analytically. A symbolic citation does not necessarily depend on the content of the cited text. Its function is to show that a topic has been mentioned in science. The article becomes a marker of recognition. A reader may cite it after reading only the title and abstract, or after confirming that it contains relevant keywords. The specific argument, sources, methods, and limitations remain secondary because the citation is not being used to support a narrowly defined factual claim. It is being used to establish that a literature exists.

This practice creates a self-reinforcing structure. An article is treated as valuable because few articles address the subject. It is cited because its title corresponds to the desired topic. The citations increase its apparent relevance. Later readers encounter a published and cited review and reasonably assume that its content has already been examined by authors, reviewers, editors, and previous users. The cost of returning to the underlying sources appears unnecessary. Institutional and bibliographic authority grows, while substantive verification remains absent. The result is an illusion of cumulative knowledge. The bibliography becomes longer. The number of citations increases. The topic appears in additional reviews, reports, proposals, and conference presentations. Yet the same unsupported claim may be transferred from one text to another without ever being independently investigated. Scientific communication expands, but scientific understanding does not necessarily expand with it.

The problem should not be reduced to inattentive individual readers. No reader can verify every source in every publication. The division of cognitive labour is unavoidable. The issue is the absence of an operative criterion determining which claims require verification and which publications deserve reliance. When thematic relevance itself becomes the primary criterion, the ordinary mechanisms of criticism are suspended at precisely the point where they are most needed. The perceived moral and political importance of the subject can strengthen this suspension. War-related environmental destruction is real, serious, and frequently neglected. Criticism of a publication addressing that destruction may therefore be misinterpreted as criticism of the subject itself. Questioning the quality of an article can appear to weaken the broader claim that military contamination deserves attention. A false opposition emerges: either support the publication or contribute to the neglect of the problem. This opposition is mistaken.

Critical evaluation does not diminish the importance of war-related environmental research. It protects that research from unreliable claims. The more consequential the subject, the less acceptable it is to treat weak evidence as sufficient. Investigations of contaminated soils can affect decisions about agricultural reuse, public exposure, demining, reconstruction, remediation, compensation, land access, and long-term monitoring. Errors are not confined to academic debate. They can influence how problems are prioritized and how limited resources

are allocated. Weak publications may also provide an excuse for institutional inaction. Once a review exists, organizations can claim that the subject has been studied. Once a numerical estimate circulates, the scale of the problem can appear known. Once broad categories of physical and chemical damage have been listed, the need for more precise investigation may appear less urgent. Superficial recognition can therefore substitute not only for knowledge but also for the creation of research capacity. The appropriate response to scarcity is not to accept any available publication as a contribution of equal value. It is to make the criteria of quality more explicit.

For research on war-related soil contamination, these criteria should include at least the following:

- a clear definition of the environmental object being studied;
- a distinction among warfare, military training, military infrastructure, weapons production, storage, disposal, and post-war intervention;
- transparent geographical and temporal boundaries;
- identification of soil types, profiles, depths, properties, and relevant baseline conditions;
- explicit description of data sources and methods of source selection;
- separation of direct measurements from estimates, models, historical reports, and illustrative examples;
- verification of central numerical claims against their cited sources;
- assessment of methodological comparability among studies;
- representation of uncertainty, contradictory findings, and negative results;
- attention to linguistic, national, institutional, and publication bias;
- inclusion of scientific knowledge produced within affected territories;
- differentiation between immediate disturbance and long-term transformation;
- identification of causal pathways rather than mere geographical association;
- evaluation of the evidential strength of conclusions;
- formulation of specific research gaps and an actionable research agenda.

These requirements do not prescribe one universal method. Research on war and soils will necessarily include field studies, remote sensing, historical reconstruction, laboratory analysis, monitoring programmes, modelling, archival work, and critical reviews. Different questions require different evidence. The essential requirement is that the relationship between question, object, method, evidence, and conclusion remain explicit. Without such criteria, the field risks evaluating publications according to external resemblance. A text contains relevant terminology, cites a large number of sources, presents precise figures, and appears in an indexed journal. It therefore looks like a contribution to knowledge. Whether it actually defines, investigates, compares, and explains its object becomes a secondary matter. The central problem is not simply that weak research exists. Weak research exists in every field. The more serious problem is that an expert community may lose the ability or willingness to distinguish between thematic participation and scientific contribution.

“Impact of War on Soils (a Review)” is instructive because it received precisely this form of thematic recognition. The article appeared to confirm that the consequences of warfare for soils were becoming an object of professional soil science. Its title directly named the problem. Its abstract provided an apparently global estimate. Its bibliography created an impression of extensive coverage. Its publication in an indexed journal supplied institutional legitimacy. These features made the article easy to welcome and easy to cite. They did not make its claims reliable. A critical reading reveals that the article’s most prominent global estimate does not describe war-affected soils at all. The figure was taken from a source concerning the real-

estate portfolio of the United States Department of Defense, converted from acres into square kilometres, and assigned a different meaning. The error is elementary, central, and reconstructable.

Its successful publication demonstrates the danger of thematic recognition without critical evaluation. A text was accepted as evidence that an important subject was being investigated. Yet the first quantitative claim used to define the scale of that subject was not based on an investigation of it. The case therefore requires a reversal of the usual presumption. The relevant question is not: Has a publication appeared on the impact of war on soils? The relevant questions are: What object was actually investigated? What evidence was actually examined? What do the cited sources actually support? What analytical operations transformed those sources into conclusions? And does the resulting publication produce knowledge, or only the academically recognizable appearance of knowledge? When thematic relevance substitutes for quality assessment, the existence of publications becomes evidence of attention—but not evidence of knowledge.

2 A figure that changed its meaning

Question for deliberation: What object does the figure of 121406 square kilometres actually measure?

Evidence decision: The correspondence between the converted acreage and the published area supports category substitution as a concrete diagnostic example of the wider failure. Arithmetic reconstruction must not be mistaken for proof of the author's private calculation history.

The published claim

The first paragraph of the abstract of "Impact of War on Soils (a Review)" contains an apparently precise assessment of the global extent of warfare-related environmental damage: "Although the entire area affected by wars is just 0.024% (121406 km²) of the total area of the Earth, the damage to the soil cover is catastrophic." The same figure is repeated in the introduction: "War-affected areas around the world cover about 121406 km² in 45 countries [59]." Presented in this form, the number appears to be the result of a global spatial assessment. A reader is led to assume that the relevant territories have been identified, their boundaries established, and their combined area calculated. The reference to 45 countries strengthens this impression. It suggests the existence of a geographically distributed dataset rather than a general approximation.

The combination of three quantities—121,406 km², 0.024%, and 45 countries—creates an appearance of mutually reinforcing precision. The square-kilometre figure implies measurement. The percentage places that measurement within a planetary comparison. The number of countries implies a defined geographical inventory. Together, they appear to answer three different questions:

- How much territory has been affected by wars?
- What proportion of Earth does this territory represent?
- Across how many countries is it distributed?

The figures are placed at the beginning of the article, first in the abstract and then in the introduction. They therefore perform more than an illustrative function. They establish the scale of the problem and organize the reader's initial understanding of it. The rhetorical structure is

clear: the affected area is small in global percentage terms, but the damage within it is catastrophic. This is an effective opening. It is also unsupported by the cited source. The cited source does not present a global assessment of war-affected soils. The published claim is not accompanied by a reproducible inventory of bombed, shelled, mined, burned, contaminated, compacted, excavated or flooded territories. Such an estimate would require spatial criteria and distinctions between combat zones, military training areas, installations, disposal sites and areas reached by secondary contaminant movement. The figure originated from a different object entirely.

What reference 59 actually measures

Reference 59 is not a scientific study of soil degradation, battlefield contamination, military landscapes, or the environmental consequences of armed conflict. It is a short article published by Military Times under the title “How Much Land Does the Military Really Own?” The subject of that publication is the real-estate portfolio of the United States Department of Defense. It reports that the U.S. military had accumulated nearly 30 million acres of land worldwide across 45 countries and eight United States territories. The category includes land owned, leased, used, or otherwise placed under the jurisdiction of the Department of Defense. The same account associates a more specific 26.9-million-acre figure with 98 percent located in the United States; this is not a separate inventory of war-damaged land. The source therefore concerns military-administered real estate.

It does not claim that the reported territory has been affected by war. It does not identify military contamination. It does not measure soil degradation. It does not estimate the global area of armed conflict. It does not classify the environmental condition of the land. It does not provide a global inventory of battlefields or post-war landscapes. It does not distinguish contaminated from uncontaminated installations. The article nevertheless converts this figure into a global estimate of “war-affected areas.” The numerical match can be reconstructed. It is consistent with converting a nominal 30 million acres, without demonstrating how the author performed the calculation: 30,000,000 × 0.0040468564224 = 121,405.692672 km². Rounded to the nearest square kilometre, this is 121,406 km², the value printed in the review. The mathematical conversion is correct. The scientific statement is false. The error does not arise from multiplication, rounding, or conversion between units. It arises from the replacement of the object being measured. A quantity referring to the land portfolio of one country’s defence institution is presented as the total global area affected by wars.

The figure retains its numerical identity while losing its original meaning. This operation is especially revealing because the error is not hidden within a complex statistical model. It does not require access to raw data or specialized software to identify. The discrepancy becomes visible as soon as the title and subject of the cited source are compared with the claim made in the review. The cited publication measures one category; the citing article names another.

Three categories collapsed into one

At least three distinct spatial objects are treated as though they were interchangeable:

- land owned, leased, administered, or used by a military institution;
- land on which military operations or armed conflict have occurred;
- land whose soils have undergone demonstrable physical, morphological, chemical, biological, or hydrological transformation as a consequence of military activity.

These objects can overlap, but they are not identical. A military installation may include administrative buildings, housing, medical facilities, warehouses, roads, ports, airfields, training areas, forests, agricultural leases, buffer zones, communication infrastructure, and undeveloped land. The fact that such territory belongs to or is used by a defence institution does not establish that it has been affected by war. Some portions may be contaminated or mechanically disturbed; others may not be. The environmental condition of the territory cannot be inferred from its administrative status. Conversely, war-affected soils are not limited to land controlled by military institutions. Most battlefields, bombed cities, damaged agricultural regions, mined territories, burned forests, destroyed industrial sites, and contaminated river basins are not part of the United States Department of Defense's property portfolio. The historical battlefields of Europe, the territories exposed to herbicides in Vietnam, the landscapes affected by the Iran–Iraq War, the oil-contaminated soils of Kuwait, the damaged lands of Gaza, the trenches and crater fields of Ukraine, and numerous other conflict-affected environments cannot be spatially represented through an inventory of U.S. military real estate.

Even land directly exposed to armed conflict is not automatically equivalent to soil demonstrably affected by war. A scientifically defensible category of war-affected soil would require an operative definition. It would be necessary to specify which kinds and degrees of alteration qualify a soil for inclusion and how those alterations are established. Possible criteria might include:

- destruction, removal, burial, inversion, or mixing of soil horizons;
- compaction caused by tracked or wheeled military vehicles;
- excavation associated with trenches, fortifications, shelters, or military infrastructure;
- crater formation and the displacement of soil material by explosions;
- contamination by explosive compounds and their transformation products;
- deposition of metals and metalloids from ammunition, vehicles, and military debris;
- petroleum contamination from damaged storage, transport, and industrial facilities;
- radioactive contamination;
- chemical warfare agents, herbicides, defoliants, or other military chemicals;
- combustion products and pyrogenic transformation;
- mine and unexploded-ordnance contamination affecting land access and management;
- erosion and hydrological change initiated by the destruction of vegetation or infrastructure;
- secondary contamination caused by reconstruction, clearance, disposal, burial, or relocation of military materials;
- measurable changes in biological activity, soil functions, fertility, or ecosystem services.

A global estimate would also need to establish thresholds. Does a territory enter the category after any detectable military-related change, or only after a change exceeding a defined ecological or regulatory level? Is the relevant unit the entire conflict zone, an individual crater, a contaminated sampling polygon, an agricultural parcel, a watershed, or an administrative region? How are overlapping forms of disturbance counted? How long does a territory remain classified as war-affected? Can remediation remove it from the category? Are historical battlefield traces equivalent to active toxic contamination? None of these questions is addressed because reference 59 was never intended to answer them. The cited source cannot be criticized for failing to provide an environmental methodology. It is a publication about military land ownership and use. The failure occurs in the soil-science article, which assigns the source a meaning it does not possess.

The illusion created by the percentage

The article does not merely reproduce the converted land area. It also presents that area as 0.024% of "the total area of the Earth." 121,406 ÷ 510,000,000 × 100 = 0.0238051 percent, rounded to 0.024 percent. The denominator is approximately 510 million km², corresponding to the entire surface area of Earth, including the oceans. The calculation therefore compares a terrestrial land figure with the total surface of the planet, approximately 71% of which is ocean. This is conceptually inappropriate in a discussion of soil degradation. Soil is predominantly a terrestrial object. If the purpose were to calculate the proportion of global land represented by 121,406 km², the relevant denominator would be approximately 149 million km². 121,406 ÷ 149,000,000 × 100 = 0.0814805 percent, approximately 0.0815 percent. This value is more than three times larger than 0.024%. However, correcting the denominator would not repair the published estimate. The numerator still does not measure war-affected soil. A more appropriate denominator cannot transform an irrelevant numerator into valid evidence.

The percentage is therefore doubly misleading. First, the numerator has been taken from an unrelated category. Second, the denominator includes the oceans in a comparison concerning terrestrial soil damage. The resulting precision is rhetorical rather than scientific. The percentage gives the impression that two independently established quantities have been compared: a measured global area of war damage and an appropriate planetary reference area. In reality, the calculation combines a military property estimate with the total surface of Earth. The formula is mathematically executable, but its output does not represent the phenomenon named in the article. This distinction is fundamental. Quantification does not become scientific merely because the arithmetic is correct. Scientific measurement requires correspondence between the numerical operation and the object the number is claimed to represent. A correctly calculated answer to the wrong question remains the wrong answer.

False precision and the rhetoric of measurement

The figure 121,406 km² appears unusually precise for a global estimate of war-affected territory. It is reported to the nearest square kilometre. Yet the original source describes the U.S. military property portfolio as "nearly 30 million acres." An approximate quantity is therefore converted into a number that appears exact. This is a familiar mechanism of false precision. Unit conversion can create additional digits without creating additional knowledge. If the original value is an approximate nearly-30-million-acre estimate, converting it into square kilometres does not justify reporting the result to the nearest square kilometre. The apparent precision is an artefact of arithmetic. The difference is not stylistic. Precision communicates an implicit claim about measurement. A figure such as 121,406 km² suggests a defined boundary and a sufficiently accurate underlying dataset. It appears more authoritative than "approximately 120,000 km²." Yet no corresponding increase in evidential resolution has occurred. Three numerical features reinforce one another:

- "121,406 km²" suggests precise spatial measurement;
- "0.024%" suggests a calculated planetary proportion;
- "45 countries" suggests global geographical coverage.

All three derive from the same non-environmental source. The 45 countries are not 45 countries whose war-affected soils were investigated. They are countries containing land associated with the U.S. Department of Defense. The square-kilometre value is not the measured extent of soil degradation. It is a conversion of the reported military acreage. The percentage is not an environmental indicator. It is the converted acreage divided by the surface of the planet. The three figures do not independently confirm one another. They are

three reformulations of the same misidentified object. The apparent density of quantitative information conceals an evidential void.

Why the error is central rather than incidental

It might be argued that the figure is only one sentence in a broader review and that the remaining discussion can be evaluated independently. Such a defence underestimates the position and function of the claim. The figure appears in the abstract—the section most likely to be read, indexed, reproduced, and cited. It is then repeated in the introduction. It is not buried in a minor historical example or an auxiliary discussion. It defines the global scale of the phenomenon that the article claims to review. The abstract has a special epistemic role. It presents the claims the author and journal consider sufficiently important and sufficiently reliable to summarize the publication. Readers commonly use abstracts to decide whether to read or cite an article. Bibliographic databases distribute abstracts independently of the full text. A false statement in the abstract therefore possesses greater circulation potential than an error located elsewhere.

The figure also supports the article's rhetorical structure. War-affected territory is presented as a very small proportion of Earth, while the damage within that territory is described as catastrophic. The contrast between small spatial extent and extreme local severity gives the opening paragraph its apparent analytical force. But neither side of the contrast is established. The 0.024% figure does not measure the global extent of war-affected soil, while "catastrophic" is not connected to an explicit criterion of severity. The sentence combines false quantification with undefined evaluation. Instead of summarizing an established result, the abstract manufactures a global proposition from an unrelated source.

What source verification would have required

Detecting the error would not have required a systematic replication of the review. It would have required several elementary operations:

- opening reference 59;
- reading its title;
- identifying the object described by the 30-million-acre figure;
- comparing that object with the claim in the citing sentence;
- asking whether military-administered land can be treated as war-affected soil;
- checking the denominator used to produce 0.024%;
- evaluating whether the stated precision is supported by the original estimate.

These operations belong to the minimum practice of scholarly source verification. They do not require advanced statistical training, field access, laboratory equipment, or specialized knowledge of soil taxonomy. They require that the source be treated as evidence rather than as a container from which a useful number can be extracted. This makes the persistence of the claim particularly important. The problem was not hidden by technical complexity. It remained visible at the interface between one sentence and one reference. A reviewer examining the article's opening global estimate should have asked how war-affected areas had been identified and mapped. An editor should have asked whether the cited publication supported the statement. A soil scientist should have questioned the comparison between soil damage and the entire surface of Earth. A reader following the citation should have encountered the categorical mismatch immediately. None of these possible checkpoints made the error consequential before publication.

Citation without evidential correspondence

A citation performs a scientific function only when the cited source supports the proposition to which it is attached. The presence of a reference number is not sufficient. The relationship must be one of evidential correspondence. Several forms of citation failure are possible. A source may be relevant to the general topic but not support the specific claim. It may support only part of a sentence. It may describe a different population, territory, period, substance, or mechanism. It may be cited for a conclusion stronger than the evidence allows. It may be a secondary source presented as though it were primary evidence. The present case is more fundamental. The source and the claim concern different objects. Reference 59 is thematically associated with the military, land, and international geography. These lexical similarities may make the citation appear superficially plausible. But thematic proximity is not evidential support. A text concerning “military land” does not thereby provide evidence about “land affected by wars.”

The error demonstrates how citation can become ornamental. The reference number gives the sentence the visible appearance of support while concealing the absence of an evidential relationship. Readers who do not open the source encounter a fully formed academic proposition: precise number, global scale, country count, and citation. Every formal component is present except the one that matters—the correspondence between claim and evidence.

The figure as a tracer of scholarly certification

The value of this example extends beyond correction of the published number. The figure can be used to trace the institutional movement of unsupported information. At its origin, the number refers to approximately 30 million acres in the real-estate portfolio of the United States Department of Defense. In the review, it becomes 121,406 km² of global war-affected territory. It is then related to the total surface of Earth and presented as 0.024%. The transformed statement enters the abstract and introduction of a scientific article. Publication in a professional journal gives it a stable bibliographic identity. Indexing makes it searchable. Subsequent citation can detach it still further from the original source. At each stage, the distance between the original object and the published claim increases. At the same time, the institutional authority of the claim increases. This is the central paradox of the case. The statement becomes less faithful to its source while becoming more recognizable as scientific knowledge.

The figure therefore operates as an epistemic tracer. Like a substance introduced into a physical system to reveal its pathways, it makes visible the route through which a claim moves:

- extraction from a source;
- conversion into a new unit;
- substitution of the measured category;
- placement within a scientific narrative;
- attachment of a citation;
- inclusion in the abstract;
- acceptance through editorial procedures;
- publication in an indexed journal;
- availability for subsequent scholarly reuse.

The number itself does not become more valid during this movement. What changes is its status. It begins as a description of military real estate and ends as a certified statement about the global environmental consequences of war.

A precise conclusion

The 121,406 km² estimate is not an imperfect approximation of the global area affected by war. It is not an estimate of that object at all. It represents the conversion of an approximate figure for the global land portfolio of the United States Department of Defense from acres into square kilometres. The accompanying percentage is produced by dividing this misidentified quantity by the total surface of Earth, including the oceans. The number of countries refers to the geographical distribution of U.S. military real estate, not to a scientific inventory of war-affected soils. The published claim is therefore false at the level of definition, source interpretation, spatial meaning, denominator selection, and reported precision. Its importance lies not only in what it reveals about one sentence. It demonstrates that the visible apparatus of scholarship—a precise number, a percentage, a geographical count, and a citation—can remain intact even when the evidential relationship underlying that apparatus has collapsed. The figure looks measured. It was converted. The claim looks sourced. Its source describes something else. The statement looks like scientific knowledge.

Its publication history shows how easily the appearance of knowledge can survive the absence of verification.

3 Soil without soils

Question for deliberation: Does the review differentiate soils and the processes that transform them?

Evidence decision: The supplied audit reports six named soil categories in the running text. Four are WRB Reference Soil Groups and two are names from other classifications; the set must not be represented as six equivalent WRB taxa. Exact counts and locations require confirmation against the archived target text [R12].

A review whose central object is never defined

The article is entitled “Impact of War on Soils (a Review).” Soils are therefore presented as its principal object of investigation. The title promises an analysis of how warfare affects differentiated natural bodies possessing particular profiles, properties, developmental histories, ecological functions, and responses to disturbance. The article never provides an operative definition of soil. This omission is not merely terminological. It affects the structure of the entire review. Throughout the paper, the words soil, soils, soil cover, soil material, soil profile, soil properties, and soil contamination are used repeatedly. Their frequency creates an impression of continuous engagement with soil science. Yet the terms refer to different objects at different points in the text. Soil can mean:

- the terrestrial surface across which military vehicles move;
- loose earth excavated during construction of trenches and fortifications;
- material displaced by an explosion;
- a sequence of genetic horizons;
- agricultural land;
- a substrate supporting vegetation;
- a medium containing toxic substances;
- a component of a landscape;
- a legally or economically usable territory;
- an environmental receptor alongside air and water;

- or, occasionally, a taxonomically differentiated natural body.

These meanings are related, but they are not equivalent. Each requires different methods of observation, different units of analysis, and different criteria of damage. A review of wartime soil degradation does not necessarily require an extended philosophical discussion of what soil is. It does, however, require a definition sufficient to determine what counts as an impact, what properties are being assessed, and how results from different studies can be compared. Without such a definition, virtually any military alteration of land can be described as an impact on soil. At the same time, processes essential to soil science can disappear because the article never establishes which properties or functions make the object a soil rather than simply ground, land, earth, sediment, terrain, or territory. The result is a review in which soil is omnipresent as a word but weakly constituted as a scientific object.

Many references to "soil," almost no differentiated soils

The paper repeatedly refers to physical, morphological, and chemical changes in soils. It discusses compaction, excavation, crater formation, mixing of horizons, deposition of metals, petroleum contamination, explosive residues, chemical agents, radionuclides, fires, erosion, and the long-term withdrawal of land from economic use. This vocabulary creates the expectation that different soils will be compared according to their vulnerability, response, transformation, and recovery. Yet, excluding soil names appearing only in titles in the bibliography, the article explicitly names only six recognizable soil taxa:

- Solonchaks;
- Cambisols;
- Histosols;
- Luvisols;
- typical chernozem;
- Al-Fe-humus podzol.

Each is mentioned only once. Moreover, Cambisols, Histosols, and Luvisols appear together in a single sentence concerning the area around Hadrian's Wall. The six named soils are therefore distributed across only four brief passages:

- Solonchaks in the discussion of Carthage;
- Cambisols, Histosols, and Luvisols near Hadrian's Wall;
- typical chernozem in the area of the Kursk battlefield;
- Al-Fe-humus podzol on defensive earthworks in the Leningrad region.

None of these taxa becomes an analytical category. Their properties are not described. Their diagnostic horizons are not compared. Their differing sensitivities to excavation, compression, fire, contamination, hydrological disturbance, erosion, burial, or vegetation change are not examined. No conclusions are derived from the fact that a Histosol, a Luvisol, a Chernozem, and a Podzol may respond very differently to the same military action. The article also mentions "clay soils" and "sandy soils." These are broad textural descriptions rather than complete taxonomic classifications. They occur in a short discussion of terrain trafficability and the construction of military structures. Again, they are not incorporated into the later analysis of compaction, contamination, crater formation, erosion, or recovery. The numerical result is revealing: a review containing many statements about "soil" provides almost no sustained analysis of actual soils.

This is not a demand that every article employ one universal soil-classification system. National traditions and international systems may use different names and diagnostic criteria.

A comparative review can acknowledge those differences and develop a translation between classifications. The problem here arises earlier. The article does not encounter classification as a methodological difficulty because soil types play almost no analytical role.

Soil as an undifferentiated surface

The dominant implicit definition in the article is soil as the upper terrestrial surface on which military activity occurs. Tanks move across soil. Trenches are dug into soil. Bombs create craters in soil. Ammunition introduces metals into soil. Fires damage soil. Refugee camps place pressure on soil. Contaminants fall onto soil. Military structures occupy soil. Under this definition, soil functions primarily as the receiving surface beneath military events. This understanding may be adequate for a broad environmental narrative, but it is insufficient for a soil-science review. A surface is a geometrical boundary. A soil is a vertically and laterally differentiated natural body with physical, chemical, mineralogical, biological, and hydrological properties that vary across horizons and landscapes. Treating soil as surface suppresses depth. It suppresses profiles. It suppresses parent material, drainage, porosity, organic matter, exchange capacity, redox conditions, biological activity, and the movement of water and substances through horizons. It also obscures the difference between superficial deposition and deeper structural transformation.

A metal concentration measured in the upper centimetres of a battlefield soil cannot automatically be compared with contamination measured at a different depth on a military training range. A crater that removes or inverts several horizons represents a different transformation from the deposition of combustion particles onto the surface. Compaction of the upper layer by vehicles differs from compression extending into the subsoil. Petroleum released onto a permeable sandy soil follows a different pathway from petroleum introduced into a fine-textured, poorly drained soil. These distinctions are basic to understanding environmental persistence and exposure. Yet they disappear when soil is represented as a uniform plane.

Soil as bulk earth-moving material

A second implicit definition treats soil as material measured by volume and displaced during military engineering. The article reports quantities of excavated or ejected soil associated with trenches, fortifications, shell holes, and explosions. In these passages, soil becomes bulk material: cubic metres removed from one place and deposited in another. Such quantities can be important. Excavation, burial, inversion, and lateral displacement are major mechanisms of military pedoturbation. They can destroy horizon sequences, expose subsoil, bury organic layers, alter drainage, initiate erosion, and create new microtopography. But a volume of excavated material is not equivalent to a volume of damaged soil in any simple sense. Several questions would have to be answered:

- Which horizons were removed?
- How deep was the excavation?
- What proportion of the material consisted of topsoil, subsoil, parent material, sediment, rubble, or anthropogenic fill?
- Where was the excavated material deposited?
- Was the original profile restored, mixed, inverted, buried, compacted, or abandoned?
- Did the disturbance alter drainage, erosion, vegetation, or organic-matter accumulation?
- Did displaced material contain contaminants?
- Was the reported volume measured, modelled, or inferred from military infrastructure?

The article does not construct such questions. It reproduces volumes as indicators of scale, but it does not translate volume into pedological transformation. The reader learns that large quantities of soil were moved. The reader does not learn what kind of soil was moved, what properties were lost, what new profile developed, or how the disturbance should be compared across different environments.

Soil as profile

The article occasionally approaches soil in a more specifically pedological sense. It discusses the mixing and removal of horizons, bomb craters, defensive earthworks, and the formation of altered profiles. It also refers to “bombturbation” as a form of pedoturbation. This could have provided the conceptual centre of the review. Military disturbance often produces new profiles and new combinations of natural and anthropogenic materials. Explosions can remove horizons, invert sequences, expose parent material, redistribute organic matter, introduce fragments of metal and construction material, create depressions with altered moisture regimes, and generate new pathways of erosion and sediment accumulation. Trenches and embankments can produce similarly complex structures. Over time, vegetation colonization, organic-matter accumulation, leaching, oxidation, gleying, bioturbation, and human reuse may transform them further. A review centred on these processes could compare:

- crater soils and trench soils;
- excavated and buried profiles;
- compacted surfaces and deeply disturbed horizons;
- short-term mechanical effects and long-term pedogenesis;
- profiles formed in different parent materials;
- disturbances under forest, grassland, agricultural, urban, and wetland conditions;
- primary wartime transformation and secondary post-war intervention.

The article does not develop this comparative framework. “Bombturbation” is named, but it is not systematically differentiated by weapon type, explosion energy, crater morphology, substrate, soil type, hydrological setting, subsequent land use, or duration of development. The text states that explosive disturbances can create crater soils with an O–A–(B)–C profile. Yet the universality and evidential basis of this formulation remain unclear. Craters formed in a forested Podzol, cultivated Chernozem, wet Histosol, urban technogenic deposit, or desert soil cannot be expected to follow an identical developmental pathway. The notation gives an impression of pedological specificity without establishing the conditions under which the proposed profile occurs. A potentially important concept is therefore introduced but not developed into a comparative analytical instrument.

Soil as a container for contaminants

The most frequent scientific role assigned to soil in the article is that of a receiving medium for contaminants. Metals, explosive compounds, petroleum products, radionuclides, chemical agents, dioxins, and military debris enter the soil. The soil then functions as a container whose condition is described primarily through the presence or concentration of hazardous substances. This receptor model is common in environmental pollution research, but it becomes inadequate when soil properties are excluded from the explanation. Soil does not passively store substances. It controls their retention, mobility, transformation, bioavailability, and transfer to water, plants, animals, and humans. The environmental behaviour of lead, antimony, copper, uranium, TNT, DNT, petroleum hydrocarbons, and organophosphorus compounds depends on multiple interacting variables, including:

- pH;
- organic-matter content;
- clay mineralogy;
- texture;
- cation-exchange capacity;
- carbonate content;
- redox conditions;
- moisture regime;
- microbial activity;
- temperature;
- vegetation;
- drainage;
- depth;
- and the physical form in which the substance enters the soil.

A measured total concentration does not automatically establish mobility, bioavailability, ecological effect, or human exposure. The same nominal concentration can have different implications in different soils. Conversely, relatively low concentrations may remain important when substances are mobile, persistent, concentrated in biologically active horizons, or repeatedly redistributed. A review of chemical impacts should therefore ask how soil properties mediate contamination. It should distinguish total from mobile or bioavailable fractions, surface contamination from profile migration, individual substances from mixtures, and initial deposition from long-term transformation. The article mainly lists contaminants and examples of their occurrence. It rarely reconstructs the processes through which soil modifies their environmental behaviour. Soil becomes the location where contamination is found rather than an active component of the contaminant system.

Soil as land

The terms soil and land are repeatedly treated as interchangeable. This substitution is especially visible when environmental damage is connected with territory, agriculture, economic use, historical landscapes, and military control. Land and soil overlap, but they are not identical research objects. Land can include surface area, legal ownership, administrative jurisdiction, economic value, land cover, land use, topography, infrastructure, vegetation, buildings, water bodies, and social relations. Soil is one component of land. A territory can become inaccessible because of mines even when its soils are chemically uncontaminated. Agricultural production can cease because irrigation infrastructure has been destroyed. A military base can occupy a large land area without producing uniform soil damage. Urban rubble can cover soil while the immediate analytical object is destroyed infrastructure rather than pedogenesis. The distinction matters because spatial estimates of affected land cannot automatically be presented as estimates of affected soil. This is precisely the category error underlying the 121,406 km² claim. Military real estate was converted into war-affected territory, and war-affected territory was then rhetorically connected to catastrophic damage to the soil cover.

Once land and soil become interchangeable, administrative area, battlefield extent, contaminated area, and damaged soil can all appear to describe the same quantity. They do not. A rigorous review should state when its unit of analysis is land, landscape, soil, soil profile, soil horizon, sampling point, contaminated polygon, agricultural parcel, military facility, conflict

zone, or administrative territory. Without this distinction, quantitative claims become impossible to interpret.

Soil as an economic resource

The article repeatedly describes damaged territories as withdrawn from economic use or rendered unsuitable for further use. In the conclusion, belligerent landscapes are presented partly through the question of their future economic, educational, cultural, or historical function. Economic usability is an important consequence of soil degradation, particularly in agricultural regions. However, economic withdrawal is not a pedological diagnosis. Land may cease to be used because of contamination, erosion, destroyed infrastructure, mine hazards, unexploded ordnance, displacement of population, legal restrictions, lack of water, loss of markets, or political insecurity. Conversely, severely degraded soil may remain in use because communities have no alternative. The relationship between soil condition and economic use must therefore be demonstrated, not assumed. The article does not develop criteria connecting particular physical, chemical, morphological, or biological changes with specific restrictions on use. It does not distinguish temporary abandonment from indefinite exclusion. It does not examine how remediation, clearance, land-use conversion, or risk management may change that status. The economic language produces an appearance of practical relevance while bypassing the mechanisms through which soil properties influence land-use decisions.

“Soil cover” as an undefined collective object

The expression soil cover appears repeatedly, including in the abstract’s statement that the damage to the soil cover is catastrophic. Yet the spatial and scientific meaning of this collective term remains unspecified. Does soil cover refer to all soils within a conflict zone? To the uppermost layer physically disturbed by military action? To a map unit? To the continuity of profiles across a landscape? To agriculturally productive topsoil? To the total pedosphere of a region? The term permits movement between scales. A local crater can be described as damage to the soil cover. A battlefield can be described in the same way. So can an entire country or global territory. Without an explicit unit of analysis, local observations and regional generalizations can be connected rhetorically without a demonstrated method of aggregation. The adjective “catastrophic” intensifies this ambiguity. Catastrophic according to which indicator? Complete profile destruction? Loss of fertility? Toxic concentrations above regulatory thresholds? Biological collapse? Irreversible change? Economic exclusion? Spatial extent? Duration? No criterion is supplied.

The statement consequently combines an undefined collective object with an undefined level of severity. Its force is evaluative rather than analytical.

The absent baseline

An impact can only be identified relative to a previous or expected condition. Yet the review does not systematically address the problem of baseline reconstruction. Wartime environmental studies often lack measurements taken before the conflict. Researchers may have to rely on reference sites, historical soil surveys, archived samples, agricultural records, geological maps, remote-sensing data, or comparisons with less-affected areas. Each method introduces uncertainty. This difficulty should be central to a critical review. Without a baseline, it may be impossible to determine whether a measured concentration originates from military activity, earlier industry, agriculture, mining, urbanization, geological background, or multiple overlapping sources. The same applies to physical degradation. Compaction may predate

military traffic. Erosion may have been accelerated by war but initiated by earlier land use. Fires may combine military and non-military causes. Craters may be identifiable, while less visible changes in hydrology or biology remain uncertain. A review should therefore distinguish:

- directly observed wartime change;
- change inferred from reference sites;
- change inferred from historical records;
- plausible military contribution to a pre-existing condition;
- and environmental damage attributed to war without a demonstrated baseline.

The article does not build this evidential hierarchy. As a result, statements of impact can appear more certain than the available methods permit.

The absent depth dimension

The article discusses soil contamination and disturbance without systematically organizing evidence by depth. This omission is especially serious because war-related impacts are vertically heterogeneous. Vehicle traffic may primarily compact surface and subsurface layers. Explosions can penetrate deeply, invert horizons, and expose parent material. Petroleum products can infiltrate along preferential pathways. Metals may accumulate near the surface or migrate under particular chemical conditions. Trench construction can connect layers that were previously separated. Burial of waste can introduce contaminants below the biologically active horizon. Sampling depth determines the meaning of a concentration. A value measured at 0–5 cm cannot be directly compared with one measured at 0–20 cm or at multiple horizons. Composite samples may conceal strong vertical gradients. Surface measurements can overestimate or underestimate deeper exposure pathways. A scientific review should therefore report and compare sampling depths wherever possible. It should examine whether studies investigate topsoil, subsoil, complete profiles, crater walls, trench fills, sediment deposits, or groundwater interfaces. The article does not do this. Contamination values and physical changes are presented across studies without a systematic depth framework.

The result is comparison without vertical comparability.

The absent temporal definition

The word impact also lacks a stable temporal meaning. War-related soil transformation is not a single event. It is a sequence that may include:

- immediate mechanical destruction;
- deposition of residues, fragments, fuels, combustion products, and debris;
- excavation, burial, and redistribution;
- post-war erosion or sedimentation;
- vegetation loss and recolonization;
- organic-matter accumulation;
- transformation and migration of contaminants;
- clearance, reconstruction, cultivation, afforestation, or abandonment;
- remediation or further disturbance;
- renewed pedogenesis.

A soil examined during combat, five years after war, and a century after war represents different stages of the same process. Concentrations can decline, migrate, transform, or become more bioavailable. Craters can fill with water, accumulate organic matter, erode, or

develop new profiles. Trenches can become drainage channels, sediment traps, ecological refuges, or sources of continuing erosion. The article moves across ancient warfare, early modern conflicts, the World Wars, Vietnam, military ranges, and contemporary conflicts without consistently distinguishing immediate effects from later transformations. Historical distance is treated primarily as chronology rather than as a variable affecting the object observed. Consequently, evidence separated by centuries can be placed in the same descriptive sequence without analysis of what precisely has persisted, what has disappeared, and what has been produced by post-war development.

The absent biological soil

The article divides impacts mainly into physical, morphological, and chemical changes. Biological degradation receives no comparable analytical status. This is a major omission. Soil is a living system. Its functions depend on microorganisms, fungi, invertebrates, plant roots, organic-matter decomposition, nutrient cycling, soil respiration, aggregate formation, and interactions among biological and mineral components. Military disturbance can affect these processes through compaction, heat, toxic substances, vegetation destruction, altered moisture, changes in pH, erosion, burial, and contamination mixtures. A soil may retain recognizable horizons while losing important biological functions. Conversely, biological activity may drive partial recovery even where physical traces of warfare persist. Microbial communities can transform explosive compounds, petroleum hydrocarbons, and other contaminants, although transformation products may also remain hazardous. A comprehensive review should therefore examine biological response and recovery as a major dimension of war-related soil change. The absence of such analysis reduces soil to physical material and chemical storage. It also contradicts the article's own interest in long-term consequences. Long-term recovery cannot be understood without biological processes.

Classification as ornament rather than method

The six named soil taxa create isolated moments of disciplinary specificity. Their presence signals soil science, but they do not organize the review. This is classification used ornamentally. Analytical classification would allow the article to compare the response of different soils to similar disturbances. For example:

- organic-rich Histosols may burn, subside, and release stored carbon after drainage or fire;
- sandy soils may permit rapid infiltration and contaminant movement;
- clay-rich soils may retain some substances while also remaining vulnerable to severe compaction;
- Chernozems may lose highly fertile topsoil through excavation, erosion, or crater formation;
- Podzols may respond through disruption of strongly differentiated horizons and changes in leaching pathways;
- saline soils may interact differently with metals, explosives, and hydrological disturbance.

Such comparisons would not require the article to resolve every inconsistency among classification systems. They would require only that soil properties become relevant to the analysis. Instead, soil names appear as local descriptive details and then disappear. The conclusions do not return to them. No statement is made about which soils are best studied, most vulnerable, least understood, or most capable of recovery. Classification supplies disciplinary vocabulary without producing disciplinary explanation.

Why the disappearance of soils matters

The absence of differentiated soils is not a narrow terminological defect. It undermines the article's central claims. The paper seeks to describe the impact of war on soils, categorize changes, assess the scale of damage, and discuss restoration. Each of these tasks depends on the properties of the affected soil. Without distinguishing soils, the review cannot adequately determine:

- why similar military actions produce different effects in different environments;
- whether contamination is likely to remain near the surface or migrate;
- which physical disturbances may be reversible;
- how quickly profiles and biological functions may recover;
- what kinds of agricultural use may remain possible;
- which remediation methods are appropriate;
- how findings from one battlefield or military range can be transferred to another;
- or which gaps in the literature are most consequential.

The article can list impacts, but it cannot explain variation in those impacts. This is the difference between saying that warfare affects soil and producing soil-scientific knowledge about warfare.

Is this adequate for an indexed soil-science journal?

The answer depends on the standard applied. As a broad introductory essay on military effects on land, the article assembles numerous historical and environmental examples. It draws attention to physical disturbance, crater formation, contamination, and the persistence of military landscapes. Such material might serve as preliminary lecture notes, a thematic overview, or the beginning of a research dossier. But the article was published as a review in a professional soil-science journal. That classification creates stronger expectations. A soil-science review should not merely use the word soil repeatedly. It should make the properties, differentiation, processes, and functions of soils essential to its analysis. The article does not meet this expectation. Its treatment of soil remains too unstable to support systematic comparison. It moves among surface, land, excavated material, profile, contaminant medium, and economic territory without defining the relationship among them. It names very few soil taxa and does not use them analytically. It largely omits baseline, depth, biological function, comparability, and recovery mechanisms.

The problem is therefore not that the review contains insufficient taxonomic vocabulary. The problem is that the research object announced in the title never acquires the structure required for investigation.

A review of impacts in search of an object

The article organizes its material around forms of impact—compaction, excavation, explosions, contamination, fires, and chemical warfare. But an impact cannot be understood independently of the object affected. The same pressure, contaminant, explosion, or fire does not produce the same result in every soil. A list of military actions cannot substitute for an analysis of soil response. Nor can a list of contaminants substitute for investigation of retention, mobility, transformation, exposure, and ecological effect. The article therefore possesses causes without adequately differentiated receptors and consequences without sufficiently defined objects. This creates an asymmetrical structure:

- military actions are described;
- pollutants are named;
- historical examples are accumulated;
- quantities are reproduced;
- but soils themselves remain largely undifferentiated.

The article is consequently not only a review of soil impacts. It is a review searching for the object promised by its own title.

Central conclusion

The paradox can be stated precisely: “Impact of War on Soils” contains many references to soil but little sustained analysis of soils. The word functions as a thematic label linking military vehicles, trenches, craters, explosives, metals, petroleum, radionuclides, fires, agricultural loss, and damaged landscapes. Yet the soils receiving these impacts are rarely identified, compared, or explained. The review therefore does not fail because it selected the wrong soil-classification system. It fails because soil classification, soil properties, soil functions, soil depth, soil biology, and soil-specific recovery remain peripheral to a paper whose central object is supposedly soil. A scientific object cannot be created merely by repeating its name. Without definition, differentiation, measurement, and comparison, “soil” becomes a container into which heterogeneous examples are placed. The result is not a global synthesis of war’s effects on soils. It is a general account of military disturbance conducted on an insufficiently specified terrestrial surface.

4 Ukraine as damaged territory without Ukrainian knowledge

Question for deliberation: How is the contemporary Ukrainian case framed and which evidence supports it?

Evidence decision: The close reading and the one-source finding in this block belong to the earlier audit. Added pre-2025 material below supplies a concrete comparator, not an exhaustive Ukrainian bibliography [R13, R14].

The most consequential contemporary case receives one source

“Impact of War on Soils” was submitted on 31 March 2025. According to its stated scope, it reviews publications from 1950 to 2024 and addresses all known military conflicts globally. It therefore appeared more than a decade after the beginning of Russia’s war against Ukraine in 2014 and more than three years after the full-scale invasion of 2022. By the time the manuscript was submitted, Ukraine had become one of the world’s largest contemporary examples of military transformation of soils and landscapes. The war involved extensive trench systems, artillery and missile strikes, aerial bombardment, crater formation, destruction of industrial and energy infrastructure, mine warfare, unexploded ordnance, military traffic, fires, flooding, damage to irrigation systems, disturbance of agricultural land, and risks associated with mines, waste storage facilities, and contaminated water. A global review of the impact of warfare on soils published in 2025 could not reasonably treat this case as marginal. Yet the article devotes only a short passage to it and supports that passage with one source. The relevant text begins:

“In Eastern Europe in 2014, as a result of the conflict between Ukraine and the Donetsk and Lugansk republics, the total volume of excavated soil (defense earthworks) exceeded 5 million m^3.” The paragraph then presents estimates for affected land, radioactive waste, shell holes,

ejected soil, and fortifications. All these claims are attached to reference 11. Reference 11 is: G. Ya. Drozd, “Physical and mechanical degradation of soils due to military actions in the area of a special military operation,” Vesti Avtomobilno-Dorozhnogo Instituta, no. 4, 24–33 (2023). Thus, one Russian publication using the official Russian designation “special military operation” becomes the sole evidential foundation for the article’s representation of contemporary war-related soil damage in Ukraine. This is not merely a small bibliography. It is a bibliographic monopoly.

The asymmetry of geographical naming

The article introduces the contemporary conflict through the phrase “In Eastern Europe in 2014.” This geographical formulation is not incorrect in the narrowest sense. Ukraine is located in Eastern Europe. But the choice is analytically significant because the article normally uses more specific geographical and political designations when describing other cases. It names Gaza. It names Ethiopia and the Tigray Autonomous Region. It names Vietnam, Yugoslavia, Kuwait, Iraq, Afghanistan, Chechnya, Stalingrad, Kursk, and the Leningrad region. Historical wars, battles, and territories are repeatedly identified with considerable specificity. In the Ukrainian case, however, the first designation is regional and impersonal: “Eastern Europe.” The war is thereby moved from a named territory into a generalized geographical zone. This reduces political and causal specificity at precisely the point where specificity is necessary to understand the environmental process. “Soil degradation in Eastern Europe” does not identify:

- the state whose internationally recognized territory is being transformed;
- the military actors producing the disturbance;
- the spatial relation between occupied and unoccupied territory;
- the changing geography of hostilities after 2014 and after 2022;
- the institutions attempting to document the damage;
- or the conditions under which evidence is produced.

Geographical abstraction is not neutral when it selectively replaces a more precise available description.

Russia’s grammatical disappearance

The article describes the events of 2014 as: “the conflict between Ukraine and the Donetsk and Lugansk republics.” Russia is absent from this formulation. Its absence is not a minor issue of political terminology. It removes a principal military actor from the causal representation of environmental damage. The reader is presented with a conflict between Ukraine and two entities designated as republics. The role of the Russian Federation in initiating, sustaining, expanding, and militarily conducting the conflict is not named. The paragraph then moves directly to quantities of excavated soil, shell holes, radioactive waste, and territory affected by explosions. Environmental effects appear, but the causal agent responsible for producing a large part of those effects disappears from the sentence. This is a form of grammatical depoliticization. The material consequences remain visible while the action that produced them is converted into an abstract “conflict.”

The passive and impersonal structure is especially important in environmental writing. Soil does not become cratered, mined, excavated, contaminated, or covered with military debris spontaneously. These conditions are produced by specific actions undertaken by specific institutions and armed forces using specific technologies in specific territories. A scientific account does not need to reproduce a political speech or legal indictment. It does need to preserve causality. Naming the aggressor and identifying the affected state are not departures

from scientific neutrality when those facts are necessary to explain the origin, geography, chronology, and character of the environmental disturbance. Omitting them does not create neutrality. It creates an incomplete causal model.

The false symmetry of “the conflict between”

The phrase “the conflict between Ukraine and the Donetsk and Lugansk republics” creates an appearance of symmetrical political entities confronting one another. This formulation has several consequences. First, it transforms an interstate war and externally supported occupation into a localized dispute. Second, it gives the entities called the Donetsk and Lugansk republics the grammatical status of independent participants equivalent to Ukraine. Third, it removes Russia from the relationship. Fourth, it detaches environmental damage from the wider military system responsible for producing it. The resulting sentence appears descriptive but contains an embedded political model. That model affects the scientific object. If the conflict is understood as a localized confrontation between Ukraine and two regional entities, the relevant geography may be restricted to “the republics’ territory” or “the zone of hostilities.” If the war is understood as Russian military aggression against Ukraine, the relevant geography includes occupied territories, areas subjected to missile and drone strikes, cross-border military infrastructure, damaged industrial systems, mining and flooding, disrupted river basins, agricultural land, and the movement of contaminants beyond the immediate front.

Political description therefore determines environmental scale. False symmetry also affects responsibility for evidence. The scientific problem becomes a condition that simply exists “between” parties rather than a sequence of actions with identifiable sources, technologies, locations, and consequences. This weakens the possibility of reconstructing causal chains.

The full-scale invasion disappears from a review submitted in 2025

The article dates the beginning of the conflict to 2014, but it does not clearly reconstruct the fundamental transformation that occurred in February 2022. A review submitted in March 2025 had access to three years of evidence concerning the full-scale invasion. By that point, the expansion in territorial scale, intensity of bombardment, construction of defensive systems, destruction of infrastructure, mining, burning, flooding, and displacement of material was impossible to treat as a minor continuation of an unchanged 2014 conflict. The article nevertheless moves from 2014 to “the zone of current hostilities” without explaining the transition. This produces temporal compression. Eleven years of changing warfare are placed within one undifferentiated paragraph. The annexation of Crimea, warfare in Donbas, the full-scale invasion, occupation of additional territories, retreat and counteroffensives, destruction of cities and industrial sites, expansion of fortification systems, and attacks far beyond the immediate front are not distinguished as different phases producing different environmental objects.

The absence of periodization matters because soil damage is cumulative and processual. A territory disturbed in 2014 may have experienced repeated shelling, occupation, trench construction, vegetation change, abandonment, renewed cultivation, mining, fire, flooding, or reconstruction. A crater field created during one phase can later be reworked by erosion or military engineering. Contaminants may migrate between phases. Agricultural use may resume and then cease again. Without temporal differentiation, the review cannot explain how the environmental consequences developed. The full-scale invasion does not merely disappear as a political event. It disappears as a transformation of the research object.

A literature review that does not review the literature

The article presents itself as a review covering global conflicts and publications through 2024. Yet for the largest ongoing war in Europe, one publication substitutes for a literature review. This is methodologically indefensible. A review should not be evaluated by a mechanical requirement that every possible publication be included. No review can include everything. Selection is unavoidable. But selection must be methodologically justified, especially when one source carries the entire representation of a major case. At minimum, the article should have identified and compared several bodies of evidence:

- Ukrainian soil-science research;
- Ukrainian environmental monitoring;
- studies by Ukrainian universities and research institutes;
- documentation produced by environmental and agricultural authorities;
- international peer-reviewed research on war-related environmental damage in Ukraine;
- remote-sensing studies of craters, fires, trenches, land-cover change, and agricultural abandonment;
- assessments by international organizations;
- research on mines and unexploded ordnance;
- investigations of damaged industrial, mining, energy, and waste-storage facilities;
- studies of water-soil interactions and contaminant transport;
- and methodological publications discussing the limitations of environmental sampling during active warfare.

The article does not map these bodies of literature, compare them, or explain their absence. It simply reproduces the estimates provided by reference 11. This is not a narrow review. It is the replacement of a literature by a source.

Source capture

When a large and contested research object is represented through a single publication, the review becomes dependent on that publication's categories, vocabulary, evidence, and political framing. This can be described as source capture. The review does not independently construct the Ukrainian case. It inherits the framing of the selected source. The phrase "special military operation" enters the bibliography through the title of reference 11. The main text describes a conflict between Ukraine and the Donetsk and Lugansk republics. Quantitative estimates are reproduced without comparison with Ukrainian or international evidence. The affected geography is described through "the republics' territory" and "the zone of current hostilities." The source therefore does more than provide data. It supplies the boundaries of what can be said. Source capture is especially dangerous in a review article because readers expect the review to place individual sources within a broader evidential field. A review should reduce dependence on any single publication by comparing methods, terminology, geographical coverage, assumptions, and findings. Here the opposite occurs. The authority of the review amplifies the authority of one source.

The source is not critically examined. Its estimates are not traced to primary measurements. Its method is not compared with alternative approaches. Its terminology is not identified as politically situated. Its limitations are not discussed. The review becomes a transmission mechanism.

Selective specificity

The Ukrainian paragraph combines extreme numerical specificity with extreme methodological opacity. It reports:

- more than 5 million m³ of excavated soil;
- approximately 8,000 hectares affected by explosive impacts;
- a 10- to 100-fold increase in radionuclide concentrations;
- more than 27 million shell holes;
- more than 314 million m³ of ejected soil;
- more than 4,700 km² affected by explosions;
- 12 million m³ of soil excavated for defences;
- approximately 2,500 km² used for fortifications.

These figures create an impression of comprehensive measurement. Yet the article does not explain:

- who performed the counts;
- which territories and dates were included;
- whether the figures were measured, modelled, extrapolated, or estimated;
- what spatial resolution was used;
- how shell holes were detected;
- whether overlapping craters were counted separately;
- how the volume of ejected soil was calculated;
- what was meant by territory “affected by explosions”;
- which radionuclides were measured;
- where the background values originated;
- which storage facilities were examined;
- or what uncertainty attaches to the estimates.

The more precise the number, the more important these questions become. Instead, quantitative specificity replaces methodological transparency. Readers are given exact-looking results without the information necessary to evaluate them. This is the same pattern observed in the 121,406 km² claim. Precision is treated as a visible sign of research even when the underlying measurement process is absent from the review.

Ukraine’s soils disappear together with Ukraine

The article’s representation of Ukraine is not only bibliographically narrow. It is also pedologically empty. Ukraine contains some of the world’s most extensive and agriculturally important Chernozem regions, as well as diverse forest, steppe, wetland, saline, alluvial, urban, industrial, and mountain soils. The consequences of compaction, crater formation, erosion, contamination, flooding, mine warfare, and agricultural abandonment cannot be understood independently of this diversity. Yet the Ukrainian passage does not identify the principal soils affected by the war. It does not ask whether particular disturbances occur in Chernozems, Luvisols, Fluvisols, Histosols, saline soils, technogenic soils, mine landscapes, or industrially transformed profiles. It does not connect military damage with soil fertility, organic-carbon stocks, erosion vulnerability, contaminant mobility, drainage, or agricultural recovery. The soil appears primarily as a volume displaced by excavation and explosions. Ukraine is consequently reduced twice:

- politically, to “Eastern Europe,” “the republics,” and “the zone of current hostilities”;

- scientifically, to undifferentiated cubic metres and square kilometres of disturbed earth.

The disappearance of the country and the disappearance of its soils follow the same analytical logic. Specificity is retained only in numerical quantities. The geographical, pedological, institutional, and human contexts that would give those quantities meaning are removed.

The omission cannot be explained by lack of available evidence

A reviewer might defend the narrow bibliography by arguing that reliable evidence from an active war zone is difficult to obtain. This is true but insufficient. Active warfare creates major obstacles to field sampling and environmental monitoring. Access may be dangerous or impossible. Sites may remain occupied, mined, or under bombardment. Laboratories and institutions may be damaged. Baseline data may be incomplete. Some estimates must rely on remote sensing, modelling, partial observations, or reports produced under emergency conditions. These limitations should have become a major subject of the review. Instead of excluding Ukrainian evidence, the article could have analysed the forms of uncertainty created by war. It could have compared field measurements with remote-sensing assessments, distinguished verified sites from extrapolated areas, discussed inaccessible territories, and identified which claims remained provisional. The existence of uncertainty does not justify dependence on one politically aligned source. It requires a broader and more explicit assessment of sources.

By 2024, substantial material was available from Ukrainian researchers, state institutions, international organizations, satellite analysis, environmental monitoring initiatives, and peer-reviewed studies. The relevant literature may have been fragmented across languages, disciplines, report series, and publication types, but fragmentation is precisely what a review is expected to address. The absence of evidence in the article is therefore not equivalent to the absence of available evidence. It is evidence of inadequate review construction.

The contrast with Gaza and Tigray

The asymmetry becomes clearer when the Ukrainian passage is compared with the neighbouring discussion of Gaza and Tigray. The article states: “As a result of the Israeli-Palestinian conflict, for example, soils in Gaza have been completely devastated, while agricultural soils in the surrounding areas have been polluted and few artificial forests destroyed [95].” It then describes the Tigray war, including artillery shelling, bombing, crater dimensions, trenches, erosion, and water pollution. These passages have their own methodological problems, including broad claims of “complete devastation.” But they name the affected territories and conflicts more directly. Gaza is Gaza. Tigray is Tigray. Ethiopia and the Tigray Autonomous Region are identified. The physical forms of disturbance are connected with particular landscapes. Ukraine, by contrast, is introduced through “Eastern Europe” and a conflict with the Donetsk and Lugansk republics. Russia is absent. The geography becomes less specific precisely where the author’s national and institutional context might make political language more consequential. This unevenness shows that neutral regional abstraction is not a general stylistic principle applied throughout the article. It is selective.

Selective imprecision is itself information.

Political language as a methodological problem

It may be argued that terminology concerning Ukraine belongs to politics rather than soil science. Such a separation is impossible in this case. Political language determines:

- how the conflict is classified;
- when it is understood to have begun;
- which military actors are included;
- what territory is considered affected;
- which institutions are treated as legitimate producers of evidence;
- which sources are selected;
- how causal responsibility is represented;
- and whether impacts inside Russia are considered part of the same environmental process.

These are methodological decisions. A description of the war as a conflict between Ukraine and the Donetsk and Lugansk republics generates one evidential geography. A description of Russian military aggression against Ukraine generates another. The first encourages the review to focus on a localized conflict zone and sources compatible with Russian official terminology. The second requires examination of a wider system extending across occupied territory, front lines, areas subjected to long-range attack, industrial and agricultural regions, river basins, and both sides of the internationally recognized border. Scientific neutrality does not require that all descriptions be treated as equally valid. It requires that terminology correspond to documented events and permit accurate causal analysis. Language that removes an actor from the causal chain does not depoliticize science. It weakens explanation.

The review's silence is itself data

A critical analysis must examine not only what a review contains but also what it systematically excludes. The relevant silences include:

- the absence of a clearly named Russian invasion;
- the absence of periodization between 2014 and 2022;
- the absence of substantial Ukrainian scholarship;
- the absence of Ukrainian monitoring institutions;
- the absence of comparison among alternative estimates;
- the absence of identifiable Ukrainian soil types;
- the absence of methodological uncertainty surrounding wartime data;
- the absence of environmental effects within contemporary Russia;
- and the absence of an explanation for these exclusions.

Any individual omission might result from limitations of space or source availability. Taken together, they form a pattern. The pattern constructs Ukraine as an object of damage while denying it substantial epistemic agency. Ukraine supplies the territory. A Russian source supplies the interpretation. The review supplies institutional certification.

The failure of peer review and editorial control

The Ukrainian section should have raised immediate questions during review. A reviewer evaluating a global article on war and soils in 2025 should have asked why the largest contemporary European war was represented through one source. A reviewer should have asked whether Ukrainian studies existed, whether the quantitative estimates had been independently verified, and whether the terminology accurately represented the conflict. An editor should have recognized that wording about disputed territories and military responsibility was not merely sensitive but methodologically consequential. The publisher's general declaration of neutrality regarding jurisdictional claims cannot substitute for accurate

description of causal events. Neutrality clauses concern the publisher's legal and institutional position. They do not release authors, reviewers, or editors from the obligation to ensure that geographical and political terminology does not distort the scientific object. The failure is especially visible because the article claims global scope. A narrowly national evidence base might be understandable in a locally framed discussion. It is not adequate for a review that presents itself as an international synthesis covering all known conflicts.

From omission to normalization

Once published, the article's framing acquires a new status. Before publication, the description of the war is one manuscript's terminology. After publication, it becomes language appearing in a professional soil-science journal. It can be cited without quotation, reproduced in other reviews, translated into additional languages, and incorporated into literature concerning military degradation. Publication therefore normalizes the framing. The description of a "conflict between Ukraine and the Donetsk and Lugansk republics" can begin to appear as an academically accepted formulation. The absence of Russian responsibility can become invisible because the sentence carries a citation and appears within a review. The exclusion of Ukrainian science can remain unnoticed because the bibliography is long. The single-source estimates can be repeated because they have already passed through a recognized journal. This is how omission becomes cumulative. Later scholarship may inherit not only the article's information but also its absences.

Central conclusion

The treatment of Ukraine combines several forms of failure:

- Bibliographic failure: one source substitutes for a literature concerning one of the most consequential contemporary cases of war-related soil transformation.
- Methodological failure: large quantitative estimates are reproduced without reconstruction of their methods, uncertainty, spatial boundaries, or evidential status.
- Temporal failure: the transformation from the war beginning in 2014 to the full-scale invasion of 2022 is not analytically represented.
- Geographical failure: Ukraine is displaced into the abstraction "Eastern Europe," while the affected territory is described through "the republics" and an undefined "zone of current hostilities."
- Pedological failure: Ukrainian soils are not differentiated or connected with the physical and chemical processes being described.
- Bibliographic exclusion: Ukrainian researchers and institutions are largely absent from the production of knowledge about damage occurring in Ukraine.
- Causal failure: Russia disappears as a military actor, weakening the reconstruction of how the environmental damage was produced.
- Editorial failure: these asymmetries passed through review and publication without becoming obstacles to the article's status as a global scientific review.

The result is not simply an incomplete account of Ukraine. It is a structured representation in which Ukraine is visible primarily as damaged space and nearly invisible as a state, a scientific community, and a producer of evidence. This asymmetry is central to the article's epistemic failure. A literature review does not become international because it describes territories in several countries. It becomes international when it critically reconstructs the plurality of evidence, methods, institutions, languages, and perspectives through which those territories

are known. In “Impact of War on Soils,” the war in Ukraine is not reviewed. It is compressed into one politically situated source and then certified as part of a global synthesis.

5 Bibliography as an epistemic border

Question for deliberation: Which sources are present and what roles do they play in the argument?

Evidence decision: Reference 2 can now be identified by title and DOI [R5]. Counts of Ukrainian scientific contribution must distinguish journal location, affiliation, study site, language, and citation function.

The question posed to the bibliography

A bibliography is not a neutral list appended to a finished argument. It is one of the principal structures through which a review article constructs its research field. The bibliography determines:

- which publications are treated as relevant;
- which languages are included;
- which scientific traditions become visible;
- which institutions are recognized as producers of knowledge;
- which territories are represented through local research;
- which methods enter the comparison;
- and which claims appear sufficiently established to be repeated.

A bibliography can therefore be examined not only by asking how many sources it contains, but also by asking what kind of evidential world it creates. “Impact of War on Soils” contains 106 references. This number produces an immediate impression of breadth. The references extend across historical periods, geographical regions, publication types, and environmental subjects. They include soil-science articles, books, conference materials, encyclopaedic entries, web resources, historical works, institutional reports, and publications concerning military landscapes, contamination, warfare, fires, herbicides, radiation, and soil formation. The numerical size of the bibliography makes the article look extensively researched. But a long bibliography can conceal a narrow evidence base. The relevant question is not whether 106 entries are present. The relevant questions are:

- Which of these sources directly investigate war-related soil damage?
- Which are primary studies?
- Which are reviews, historical descriptions, general references, or illustrative materials?
- Which countries and conflicts are represented through local scientific research?
- Which languages and institutions dominate?
- Which sources support the article’s central contemporary claims?
- And, most importantly in the present context, does the bibliography include Ukrainian research on soils damaged by the war in Ukraine?

The answer to the final question is effectively no.

The one Ukrainian publication

Among the 106 references, one publication can be identified as originating from a Ukrainian soil-science journal: S. A. Balyuk, V. V. Medvedev, L. I. Vorotintseva and V. V. Shymel (2017), Modern problems of soil degradation and measures to achieve land degradation neutrality,

Visnyk Ahrarnoi Nauky 95(8), 5–11. DOI: 10.31073/agrovisnyk201708-01. The English title here is a translation of the Ukrainian title [R5]. Its inclusion is important because it prevents an overly broad claim that the article cites no Ukrainian publication at all. But the existence of one Ukrainian reference does not resolve the problem. The 2017 article concerns soil degradation in general. It predates the full-scale invasion of 2022 and is not used as evidence concerning wartime damage to Ukrainian soils. It does not represent Ukrainian investigation of the environmental consequences of the ongoing war. The distinction must be stated precisely:

- the bibliography contains one identifiable Ukrainian soil-science publication;
- the article does not use a Ukrainian publication to represent scientific research on soils damaged by the Russia–Ukraine war.

Numerical inclusion is not substantive inclusion. A Ukrainian article appears in the bibliography, but Ukrainian wartime expertise does not structure the discussion of Ukraine.

The sole source for wartime soil damage in Ukraine

The article's quantitative representation of contemporary damage in Ukraine depends on reference 11: G. Ya. Drozd, "Physical and mechanical degradation of soils due to military actions in the area of a special military operation," Vesti Avtomobilno-Dorozhnogo Instituta, no. 4, 24–33 (2023). This Russian publication supports the claims concerning excavated soil, shell holes, explosion-affected territory, fortifications, and radioactive risks. The central bibliographic structure is therefore not simply imbalanced. It is singular. One Russian source represents the environmental consequences of Russia's war on Ukrainian territory. No Ukrainian source is placed beside it to confirm, contradict, contextualize, refine, or challenge its estimates. No international study is used to triangulate the figures. No methodological comparison is offered. The limitations of the source are not discussed. The source enters the review as if it were a transparent container of facts rather than a publication produced within a particular institutional, political, methodological, and linguistic context. The absence of comparison converts citation into dependence.

Bibliographic monopoly

A bibliography becomes monopolistic when one source controls the representation of a major object that should be reconstructed through multiple forms of evidence. The problem is not that a Russian source is cited. Russian publications should not be excluded solely because of their national origin. A critical review may need to examine Russian scientific, military, technical, geographical, or environmental materials, especially when those materials contain relevant observations unavailable elsewhere. The problem is that the Russian source is not placed within a plural evidential field. A scientifically adequate review would ask:

- What evidence does the publication use?
- Are its estimates based on field measurements, remote sensing, military records, extrapolation, or secondary citation?
- Which territories are included?
- Which dates and phases of the war are covered?
- What terminology structures the analysis?
- Which uncertainties are acknowledged?
- Do Ukrainian measurements support the same conclusions?
- Do international assessments produce similar estimates?
- Are the reported quantities independently reproducible?

- What is omitted by the source's geographical and political framing?

None of these questions is posed. The citation is treated as sufficient because it exists. This reproduces the broader mechanism examined throughout the present protocol: the visible sign of evidence substitutes for the evaluation of evidence.

Ukraine as damaged territory but not as a producer of knowledge

The bibliography constructs a profound asymmetry. Ukraine appears as:

- territory where shell holes are counted;
- territory where soil is excavated;
- territory where fortifications are constructed;
- territory where radioactive waste facilities are located;
- territory where explosions disturb land;
- territory where environmental damage is quantified.

Ukraine does not appear comparably as:

- a scientific community;
- a network of soil scientists;
- a system of environmental monitoring institutions;
- a source of field observations;
- a producer of remote-sensing analysis;
- an authority on its agricultural soils;
- a source of methodological knowledge about sampling during war;
- or an interpreter of environmental transformation occurring within its own internationally recognized territory.

This is more than a gap in citation practice. It is a distribution of epistemic roles. Ukraine supplies the damaged object. Another national system supplies the authoritative description. The territory is included while the producers of knowledge located within that territory are excluded.

The "empty field" effect

The absence of Ukrainian scholarship creates the impression that little or no Ukrainian expertise exists. A reader unfamiliar with the field may reasonably infer from the review that the war's effects on Ukrainian soils have barely been studied, that only one relevant quantitative source is available, or that Ukrainian institutions have not produced usable evidence. This is the "empty field" effect. The field appears empty not necessarily because evidence is absent, but because the review has not represented it. Bibliographic exclusion is transformed into an apparent property of the research domain. This effect is especially powerful in a review article. Readers often rely on reviews to locate unfamiliar literature. If a review omits a national research community, later researchers may repeat the omission because they use the review as their point of entry. What begins as incomplete source selection can become cumulative non-recognition. The omitted scholarship becomes progressively more difficult to discover. It is not cited because it was not cited.

National expertise is not automatically sufficient, but its exclusion requires explanation

Local or national origin does not guarantee scientific quality. Ukrainian publications should not be accepted uncritically merely because Ukraine is the affected country. National research can contain methodological weaknesses, political framing, inaccessible data, institutional constraints, and conflicting interpretations. But this does not justify its exclusion. Scientists and institutions located within an affected country may possess forms of access and knowledge unavailable to external researchers:

- historical soil surveys;
- pre-war agricultural and environmental data;
- archived samples;
- local soil maps;
- knowledge of industrial and mining sites;
- access to national monitoring systems;
- information about land use before occupation or bombardment;
- field observations collected during changing phases of the war;
- direct knowledge of sampling constraints;
- and continuing contact with affected communities and territories.

This expertise must still be evaluated. But evaluation is possible only after the evidence has been identified and included. Exclusion is not criticism. A review that omits Ukrainian research has not demonstrated that the research is unreliable. It has simply prevented the reader from examining it.

Source imbalance is especially consequential during war

All scientific sources are situated. During war, this fact becomes impossible to ignore. Governments, military institutions, research organizations, universities, environmental agencies, international organizations, local communities, and independent investigators may have different access to territory, data, records, and publication channels. Their terminology may reflect legal positions, security constraints, political loyalties, or institutional mandates. This does not mean that every wartime publication is propaganda or that reliable science becomes impossible. It means that source comparison becomes essential. A review of an active war should not rely on one national source when the source's state is a principal military actor in that war. The requirement is not automatic rejection. It is triangulation. Triangulation might include:

- comparison of Russian and Ukrainian publications;
- use of international remote-sensing data;
- examination of United Nations and other intergovernmental assessments;
- evaluation of primary measurements;
- comparison with independent environmental monitoring;
- identification of disagreement among estimates;
- and explicit separation of confirmed observations from politically framed claims.

The article does not undertake this work. It transfers figures from one source into a global review and thereby grants them a second layer of authority.

A long bibliography can conceal a narrow evidential base

The total number of references is misleading if it is treated as a measure of evidential coverage. Many entries concern other wars, military training grounds, historical geography, human influence on soil formation, soil classification, fire, herbicides, toxicology, or general military landscapes. These sources may be relevant to particular parts of the article. But they do not compensate for the absence of a literature on the central contemporary case. Bibliographic quantity is not fungible. Ten publications on historical fortifications cannot substitute for missing evidence on present-day contamination in Ukraine. A general soil-science textbook cannot substitute for field measurements. A publication concerning a military range cannot automatically substitute for research in an active battlefield. A study of another conflict cannot establish the spatial extent of damage in Ukraine. The bibliography must therefore be evaluated according to the claims it supports, not as one undifferentiated total. When this is done, the apparent breadth contracts sharply. The section on the Russia–Ukraine war depends on one source. The article has 106 references globally but only one effective evidential channel for its most consequential contemporary example.

The Ukrainian source is disconnected from the Ukrainian war

The inclusion of the 2017 Ukrainian soil-science publication produces an additional appearance of balance. A reader scanning the bibliography may notice a Ukrainian journal and conclude that Ukrainian science is represented. But bibliographic presence must be linked to argumentative function. The article does not use the Ukrainian publication to explain wartime damage. It does not connect it to the quantitative claims about the war. It does not use it to establish a pre-war baseline, characterize Ukrainian soil degradation, identify soil types, or frame the vulnerability of agricultural land. The Ukrainian source and the Ukrainian war occupy separate parts of the article. This disconnection matters because bibliographic diversity can be simulated by including nationally varied references without allowing those references to influence the analysis of the relevant case. Representation must therefore be evaluated not only at the level of the reference list but also at the level of citation placement and argumentative role. A source can be present in the bibliography and absent from the knowledge structure of the paper.

The missing Ukrainian soil object

The exclusion of Ukrainian research contributes directly to the article's failure to differentiate Ukrainian soils. If Ukrainian soil-science literature had been substantively incorporated, the review would have had to engage with the country's soil geography, agricultural significance, regional differentiation, historical monitoring, degradation processes, and national classification traditions. Instead, the war-damaged soil of Ukraine appears mainly as displaced material measured in cubic metres and affected territory measured in hectares or square kilometres. This is an impoverished representation of one of Europe's most important agricultural soil systems. The absence of Ukrainian expertise and the disappearance of differentiated soils are therefore connected. Bibliographic exclusion produces conceptual simplification. The article does not merely fail to cite a set of researchers. It loses access to the object those researchers study.

Omitted voices and distorted uncertainty

The exclusion of affected-country expertise changes not only what appears known but also how uncertainty is represented. A single source can present precise figures without revealing the range of disagreement surrounding them. Multiple sources might show that:

- estimates differ according to territorial coverage;
- remote-sensing counts do not match field observations;
- occupied territories remain inaccessible;
- crater density varies substantially;
- soil contamination is highly localized;
- pre-war industrial contamination complicates attribution;
- sampling depths and analytical methods differ;
- some claims remain projections rather than measurements;
- and damage estimates change rapidly as the war continues.

A review should make such uncertainty visible. When only one source is used, uncertainty disappears. The selected estimate occupies the entire evidential space. Readers cannot see whether it is unusually high, unusually low, methodologically innovative, politically constrained, or unsupported by other studies. Bibliographic plurality is therefore not a ceremonial requirement of international balance. It is a method for reconstructing uncertainty.

Citation as recognition

Citation has both evidential and social functions. Evidentially, a citation identifies the source supporting a statement. Socially, it recognizes a publication and its authors as participants in the production of knowledge. To cite Ukrainian scientists studying Ukrainian soils is not to grant them automatic correctness. It is to recognize that they belong to the field whose literature is being reviewed. Their work can then be examined, criticized, compared, and, where necessary, rejected. To omit them is to deny that participation. This matters because scientific recognition affects future visibility. Citations influence search results, review articles, institutional assessments, collaborations, funding, and the formation of research networks. Exclusion from a supposedly global review can reproduce wider inequalities in whose knowledge is discoverable and whose knowledge becomes authoritative. The pattern is particularly troubling in research on war. The communities bearing the environmental consequences can become objects of external description while their own experts remain absent from the recognized knowledge system.

What a minimally adequate bibliography should have contained

A minimally adequate review of the Russia–Ukraine war and soil degradation should have included several distinct bodies of material. First, it should have included Ukrainian soil-science research on physical, chemical, morphological, and biological damage to soils. Second, it should have examined Ukrainian environmental monitoring concerning contamination, mines, unexploded ordnance, damaged industrial facilities, fires, agricultural land, and affected water systems. Third, it should have included international peer-reviewed research on the environmental consequences of the war. Fourth, it should have examined assessments produced by relevant international organizations, while clearly distinguishing institutional reports from peer-reviewed research. Fifth, it should have included remote-sensing studies mapping craters, trenches, fires, land-cover change, flooding, military traffic, and agricultural abandonment. Sixth, it should have included research on mines and unexploded

ordnance and their implications for soil access, sampling, agriculture, and remediation. Seventh, it should have addressed the industrial and mining geography of Donbas, including groundwater, waste-storage, subsidence, and the interaction between pre-war contamination and wartime damage.

Eighth, it should have examined methodological literature on conducting environmental research during active conflict, including questions of safety, incomplete access, missing baselines, remote verification, and uncertainty. Finally, it should have compared sources produced by different national and institutional actors instead of allowing one publication to define the case. This would not require the review to accept all available estimates. It would require the review to demonstrate that it had identified the field it claimed to synthesize.

The political sociology of the bibliography

The bibliography can be read as a map of recognition. It shows which institutions are allowed to speak, which national traditions become visible, and which sources are transformed into global scientific claims. In the Ukrainian case, the map is asymmetrical:

- the affected territory is Ukrainian;
- the principal source is Russian;
- the validating journal is international in circulation;
- the publisher provides English-language dissemination;
- bibliographic indexing gives the article global discoverability;
- subsequent readers encounter the resulting account as a review of world literature.

This sequence converts a narrow national source base into an internationally certified representation. The process does not require explicit coordination. Each institution can perform its ordinary function. The author selects sources. Reviewers evaluate the manuscript. Editors accept it. Translators prepare the English text. The publisher releases it. Databases index it. Readers cite it. The asymmetry is reproduced through normal procedures. That is precisely why it matters.

The responsibility of reviewers and editors

Reviewers and editors cannot be expected to identify every relevant Ukrainian publication. But they should be expected to recognize when a globally framed review uses one source for a major contemporary case. Several elementary questions should have been unavoidable:

- Why is Ukrainian wartime soil research absent?
- Why does one Russian publication support all the principal estimates?
- What method produced those estimates?
- Have they been independently verified?
- Does the terminology accurately represent the war?
- What literature exists in Ukrainian?
- What international assessments are available?
- How does the article address inaccessible territories and uncertainty?
- Why are Ukrainian soils not differentiated?

These questions do not require comprehensive expertise in every subfield. They follow from the article’s own claim to be a global review. Failure to ask them is not a minor bibliographic oversight. It permits one source to become a substitute for an entire research landscape.

Precise conclusion

The bibliography of “Impact of War on Soils” contains 106 references, but its representation of wartime soil damage in Ukraine is based on a single Russian publication. One Ukrainian soil-science article appears in the reference list, but it is not a study of wartime damage and does not shape the analysis of the war. The relevant conclusion must therefore be stated carefully: The article does not contain no Ukrainian source at all. It contains no identifiable Ukrainian source used to represent Ukrainian scientific research on soils damaged by the Russia–Ukraine war. This distinction strengthens rather than weakens the criticism. It demonstrates that simple reference counting is insufficient. The question is not only who appears in the bibliography, but what role each source is permitted to play. Ukraine appears as damaged territory. Ukrainian science does not appear as a significant source of knowledge about that damage. The long bibliography conceals this exclusion by creating an overall impression of breadth. Yet at the point where evidential plurality is most necessary, the review depends on a bibliographic monopoly.

The result is an epistemic border. Evidence can cross that border from a Russian source into an international review. Ukrainian expertise largely cannot. A bibliography of 106 references therefore produces not a global synthesis, but a selective geography of scientific recognition.

6 A war that stops at the border

Question for deliberation: Are environmental mechanisms treated consistently on both sides of a border?

Evidence decision: This is a critique of scope and evidentiary consistency. Plausible pathways and documented military events must not be presented as measured Russian soil contamination in the absence of measurements.

The geographical selectivity of the review becomes especially apparent when one asks a simple question: does the article discuss any damage to soils within the Russian Federation resulting from the same war whose consequences it describes on the territory of Ukraine? The answer is no. This absence is remarkable because the article was submitted on March 31, 2025, and claims to review literature published up to 2024. By that time, the Russian–Ukrainian war had been underway for more than a decade. The full-scale phase had continued for more than three years. Military operations had ceased to be confined to internationally recognized Ukrainian territory. Russian border regions had experienced shelling, missile and drone strikes, fires, the construction of fortifications, military traffic, the movement and storage of ammunition, damage to infrastructure, and the accumulation of military debris. Strikes against military, transport, industrial, and energy facilities created obvious pathways for the release of petroleum products, combustion residues, metals, construction materials, and other contaminants into terrestrial environments.

Not every such event had necessarily been followed by a published soil investigation. That limitation should be acknowledged. Yet the absence of direct measurements would not justify the complete disappearance of Russian territory from the review. A scientifically responsible review could have distinguished among at least three levels of evidence:

- directly measured changes in Russian soils;
- documented military events with probable or plausible consequences for soils;
- potential environmental risks for which systematic soil research had not yet been conducted.

The reviewed article makes none of these distinctions. It neither presents measurements of contemporary war-related soil damage within Russia nor identifies the absence of such measurements as a research gap. It does not discuss documented mechanisms by which the war could affect Russian soils. It does not ask whether contamination has been investigated in border regions, around damaged infrastructure, near military facilities, or in territories subjected to defensive construction. Most importantly, it does not explain why the Russian side of the war's environmental geography has been excluded. This omission is not a minor matter of incomplete coverage. It reveals that the geography of the review is organized by something other than the geography of material environmental processes.

Russia Is Present Historically but Absent Contemporaneously

The disappearance of contemporary Russian territory cannot be explained by a general lack of interest in Russia or the former Soviet Union. The article readily discusses historical examples connected with territories now located within the Russian Federation. It refers to the battles of Stalingrad and Kursk, wartime changes in the Leningrad region, the consequences of the Chechen wars, and other military disturbances affecting Russian or Soviet landscapes. Russian territory is therefore not outside the historical scope of the paper. The asymmetry is temporal and political. Russia can appear as a territory damaged by wars that belong safely to the past. It can appear as a site of historical battles, a location of post-war soil recovery, or a source of retrospective examples. What it does not become is a territory environmentally affected by the war that the Russian state has been conducting against Ukraine since 2014 and radically expanded in 2022. The result is a peculiar division of analytical space. Historical warfare is allowed to have ecological consequences in Russia. The contemporary war is not.

This division cannot be justified pedologically. Explosions do not cease to displace soil when they occur on the Russian side of an international border. Fuel does not cease to contaminate soil when it escapes from infrastructure located in Russia. Military vehicles do not cease to compact soil, fortifications do not cease to disturb soil horizons, and fires do not cease to change soil chemistry because the affected territory belongs to the state responsible for initiating or continuing a war. The physical mechanisms remain the same. If the article's subject is genuinely the impact of war on soils, then its unit of analysis should be the environmental process. Its geographical coverage should follow the locations in which those processes occur. Instead, the war appears to reach the Russian border and then lose its capacity to affect soil.

Environmental Geography and Political Responsibility Are Different Questions

Recognizing damage to soils within Russia does not require equating the positions of Russia and Ukraine. This distinction is essential. There is no need to create a false moral, political, or legal symmetry between the aggressor state and the state subjected to invasion. An analysis of environmental effects should not erase responsibility for the outbreak, continuation, or territorial expansion of the war. Nor should a description of damage on Russian territory be used to relativize the much greater destruction inflicted on Ukraine. However, causal and geographical completeness is not the same as moral equivalence. A war can have radically unequal causes, responsibilities, scales of destruction, and human consequences while still producing environmental effects on more than one side of a border. Acknowledging those effects does not distribute responsibility equally. It simply prevents political boundaries from replacing scientific observation. Indeed, the two questions should be explicitly separated:

- Who is responsible for the war and its consequences?

- Where, through which mechanisms, and on what scale have soils been affected?

The first is a question of political, historical, and legal responsibility. The second is an empirical question concerning the distribution of environmental effects. The answer to the second cannot be determined merely by the answer to the first. A scientifically serious review should be capable of making both distinctions simultaneously. It should identify the asymmetry of responsibility without constructing an artificially one-sided environmental geography. The article does neither. It largely avoids the question of responsibility while also excluding one part of the affected geographical space.

The Missing Russian Research Object

The omission has consequences beyond geography. It eliminates an entire potential research object. Contemporary military effects on Russian soils could include several distinct categories:

- mechanical disturbance caused by explosions and crater formation;
- excavation, horizon mixing, and compaction associated with defensive earthworks;
- contamination resulting from destroyed vehicles, ammunition, fuels, and lubricants;
- deposition of combustion products following fires and strikes on infrastructure;
- dispersal of construction debris and potentially hazardous building materials;
- changes to agricultural land resulting from restricted access, military use, or abandonment;
- local effects of military logistics, heavy transport, temporary storage, and field installations;
- secondary erosion and altered drainage caused by disturbed surfaces;
- contamination associated with damaged industrial or energy facilities;
- risks related to unexploded ordnance and munition residues.

The existence and magnitude of each category would have to be established empirically. Some might prove locally important; others might be negligible. The point is not to assume catastrophic damage in advance. The point is that a review devoted to war and soil should identify these as questions requiring investigation. Instead, contemporary Russia is not formulated as a possible site of soil research at all. The article therefore fails even at the level of defining unanswered questions. It does not say that evidence is insufficient. It does not say that available information is fragmentary or inaccessible. It does not state that no peer-reviewed soil measurements could be found. It simply leaves the subject outside the frame. There is an important difference between reporting an absence of evidence and producing an absence through the design of a review. In the first case, a reviewer searches for relevant studies, evaluates the result, and identifies a gap. In the second, the territory, literature, or question is omitted before the gap can even become visible. The article appears to perform the second operation.

The Asymmetry of Evidentiary Standards

The omission becomes more striking when compared with the article's treatment of Ukraine. For Ukrainian territory, the author is prepared to reproduce highly specific estimates concerning shell craters, displaced soil, fortifications, and affected areas from a single Russian publication. These figures are presented despite the absence of transparent triangulation and despite the review's failure to incorporate Ukrainian scientific evidence. For Russian territory, by contrast, even general categories of possible damage are absent. The evidentiary threshold is therefore asymmetrical. A single Russian source is sufficient to support large quantitative claims about Ukraine. Yet the observable extension of military activity into Russian territory does not generate even a statement that soil effects may exist and require investigation.

This is methodologically difficult to defend. If indirect evidence, military reports, spatial estimates, and accounts of visible landscape disturbance are admissible for one territory, the review should explain why equivalent kinds of evidence are inadmissible for another. If only peer-reviewed soil measurements are considered sufficient, then many of the article's claims concerning Ukraine should also have been excluded or qualified. A consistent review cannot alternate between permissive and restrictive standards according to geographical location. The problem is not merely that some cases receive more attention than others. Every review must be selective. The problem is that the criteria of selection are not stated, and the pattern of inclusion corresponds too closely to a politically convenient division of space. Ukraine can be represented as a damaged landscape. Russia cannot be represented as a contemporary landscape affected by the consequences of the same war.

A Review That Does Not Review Absence

A review article is not expected to manufacture evidence where none exists. It is, however, expected to make the structure of available and unavailable knowledge visible. If direct research on war-affected Russian soils was scarce by the end of 2024, that scarcity should itself have been reported as a significant finding. Several questions would then follow:

- Have soil surveys been conducted in Russian border regions affected by military activity?
- Have crater soils, fortification zones, burned sites, or damaged industrial locations been sampled?
- Are monitoring results available but unpublished?
- Do institutional or political barriers restrict access to relevant environmental data?
- Are military impacts recorded only as damage to infrastructure, without soil assessment?
- Is contamination discussed in technical reports but absent from peer-reviewed soil-science literature?
- Are researchers able to formulate and publish such questions openly?
- Does the terminology used in Russian publications prevent the relevant studies from being identified as research on the environmental consequences of war?

These would be legitimate findings for a critical review. The absence of studies would become part of the map of knowledge. It could point to a neglected research area, an institutional restriction, a methodological difficulty, or a politically produced silence. Gordienko's article does not perform this work. The lack of evidence is not examined; it is merely reproduced as a blank space. Consequently, readers cannot determine whether Russian soil damage has not occurred, has not been investigated, has not been published, has not been searched for, or has been excluded from the review for unstated reasons. These possibilities are scientifically different. Collapsing them into silence transforms uncertainty into apparent nonexistence.

The Border as an Epistemic Filter

The article's treatment of the war suggests that the international border functions as an epistemic filter. Military processes are visible on one side and invisible on the other. The review does not simply describe uneven evidence; it helps create an uneven field of visibility. On Ukrainian territory, the war produces craters, displaced soil, radioactive risks, fortifications, and enormous numerical estimates. On contemporary Russian territory, it produces no soil processes at all. This is not a plausible physical geography. It is a narrative geography. Such a narrative performs several operations simultaneously. It separates present-day Russia from the environmental consequences of the war. It frames war-related soil destruction as something occurring elsewhere. It also prevents the review from examining how the war

creates transboundary and reciprocal environmental processes without creating equal political responsibility.

The effect is subtle because it is achieved mainly through omission. There is no explicit statement that Russian soils remain unaffected. There is no argument defending their exclusion. The relevant territory simply disappears. This makes the resulting representation appear natural: the reader encounters a discussion of damage in an vaguely defined “Eastern Europe” and is not invited to ask where else the same war has produced environmental consequences. Omission is especially powerful in a review article because reviews are expected to define the boundaries of a field. What a review excludes may cease to look like a legitimate research question. Readers often treat the geography assembled by the reviewer as an approximate geography of existing knowledge. If that assembly is selective, political selectivity can be mistaken for scientific absence.

The Consequences for the Article’s Claim to Global Coverage

The exclusion also undermines the article’s broader presentation as a review of the impact of war on soils. A global or comprehensive review does not have to discuss every conflict and every affected location. It must, however, explain its scope and apply coherent selection criteria. The article offers no methodology that would account for the exclusion of contemporary Russian territory. There is no systematic-search protocol, no geographical inclusion rule, no hierarchy of evidence, no date-based explanation, and no statement that relevant studies could not be found. The reader is therefore left with an unexplained absence inside one of the most important contemporary cases considered by the paper. This weakens the review at several levels. First, it compromises geographical completeness. The same conflict is divided into visible and invisible environmental spaces. Second, it compromises causal analysis. Military processes that operate across borders are represented as if they belonged only to one territory. Third, it compromises the assessment of research gaps. The absence of Russian soil studies, if real, is not recognized as a gap requiring explanation.

Fourth, it compromises bibliographic neutrality. The review depends heavily on Russian framing and Russian sources while failing to turn analytical attention toward Russian territory. Fifth, it compromises the article’s usefulness for future research. A reader cannot derive from it a coherent agenda for studying the full environmental footprint of the war. The issue is therefore not a demand for exhaustive description. It is a demand for explicit, consistent, and scientifically defensible boundaries.

Institutional Silence and the Normalization of Selective Geography

As with the article’s misuse of the figure of 121,406 km² and its exclusion of Ukrainian expertise, the omission of contemporary Russian soil damage also raises questions about editorial certification. A specialist reviewer should have asked whether the geography of the contemporary war had been represented consistently. An editor should have noticed that an article submitted in 2025 described the war beginning in 2014 without examining its effects on Russian territory or explaining their exclusion. A journal specializing in soil science should have required the author to distinguish between absence of damage, absence of studies, absence of accessible data, and absence from the search strategy. Apparently, none of these distinctions was required before publication.

The important point is not that every reviewer must share a particular political interpretation. The problem precedes political interpretation. It concerns elementary review methodology. A review that discusses a continuing transboundary war must define the geographical scope of

its evidence. If it excludes one affected territory, the exclusion must be justified. If no studies are available, that absence must be reported rather than silently converted into a blank space. The publication process instead certified an asymmetrical geography without making that geography available for scrutiny. Once published in an indexed journal, the resulting account acquires the appearance of disciplinary legitimacy. Later authors may cite it as a general review of war-related soil impacts. Its omissions can then be inherited by subsequent papers, presentations, policy documents, and literature reviews. In this way, selective geography can become cumulative. One review excludes a territory. The next review cites the first. The absence becomes normalized, and normalization is eventually mistaken for evidence that there is nothing to investigate.

Conclusion: The War Enters Russia, but Not the Review

The absence of contemporary Russian soil damage from the article cannot be treated as a trivial gap in an otherwise systematic review. It is part of a broader pattern in which the boundaries of the research object are produced through unacknowledged selection. The article can discuss historical damage to Russian soils. It can reproduce Russian estimates of damage on Ukrainian territory. It can describe contemporary conflicts in Gaza and Tigray. Yet it does not ask what the ongoing Russian–Ukrainian war has done, may have done, or has not yet been shown to have done to soils within Russia itself. A scientifically responsible review did not need to claim that such damage was extensive. It needed to ask the question, search for evidence, distinguish measured effects from plausible risks, and state the limits of available knowledge. Its failure to do so is precisely what makes the omission significant. The physical geography of war does not end at a politically convenient border. Neither should the geography of scientific inquiry.

In Gordienko's review, however, the war enters Russian territory militarily but not scientifically. Russia appears as a source of publications, terminology, numerical claims, and historical examples, but not as a contemporary object of environmental investigation. The border consequently becomes more than a political boundary: it becomes the point at which the review's proclaimed research object disappears. This is not simply missing information. It is a structured absence—one that reveals how a formally scientific text can reproduce a politically selective field of visibility while retaining all the external signs of neutral scholarly knowledge.

7 A review without review conclusions

Question for deliberation: What does the conclusion establish about the literature rather than about war in general?

Evidence decision: The block asks whether the reviewed corpus is transformed into comparative knowledge, uncertainty and a research agenda. It is an analytical judgment, not a formally scored assessment.

The conclusion of a review article provides a particularly revealing test of whether the review has performed its scholarly function. An ordinary empirical paper may conclude by restating its principal result. A review has a more demanding task. It must transform a collection of publications into an assessment of the state of knowledge. A review conclusion should therefore tell the reader not merely what happens in the world, but what the examined literature allows researchers to know about what happens in the world. It should identify the strengths, weaknesses, boundaries, internal divisions, and unresolved problems of the existing evidence. The conclusion of Impact of War on Soils (a Review) does not perform this function.

It restates the general proposition that wars damage soils, supplements it with a simplified contrast between ancient and modern warfare, and declares that further research remains important. These propositions may be reasonable, but they do not constitute a synthesis of the 106 sources listed in the bibliography. The article consequently reaches the end of a review without producing conclusions about the literature it has ostensibly reviewed.

What the Conclusion of a Review Should Establish

A review article is not a container into which statements from previous publications are placed. Its scholarly value lies in the operations performed upon those statements: selection, classification, comparison, verification, contextualization, and synthesis. The conclusion should present the results of those operations. At a minimum, it should explain:

- what kinds of military impacts have actually been investigated;
- which soils, territories, conflicts, and historical periods dominate the literature;
- which research designs and analytical methods have been employed;
- which findings are independently reproduced across different studies;
- which conclusions depend on isolated cases or single publications;
- which results are contradictory or difficult to compare;
- which forms of evidence are direct and which are estimated or inferred;
- which geographical regions and scientific communities are represented;
- which relevant regions, soil types, processes, and expert communities are absent;
- what methodological weaknesses restrict interpretation;
- and which precise research priorities follow from these limitations.

A critical review should go further. It should determine whether apparently similar studies are genuinely comparable, whether the categories used in the literature are conceptually coherent, whether uncertainty is adequately reported, and whether linguistic, geographical, political, or institutional selection has shaped the available corpus. The conclusion should therefore represent the review's principal analytical product. It is where a bibliography becomes a map of knowledge. Gordienko's conclusion does not provide such a map.

The Actual Content of the Published Conclusion

The published conclusion consists of three broad movements. First, it states that human activity changes the appearance, properties, regimes, and structure of soils. It adds that the effects of military activities are often underestimated because deaths, injuries, and destruction of infrastructure understandably receive greater public attention. Second, it offers a simplified historical narrative. Ancient warfare is associated principally with physical disturbance, whereas modern warfare is said to cause complete soil destruction, intensive "bombturbation," and chemical contamination. Weapons of mass destruction are connected with radionuclides, dioxins, and the indefinite withdrawal of land from economic use. Third, it turns toward the future. The effects of future weapons are described as difficult to predict. Interstate wars are said to be declining while local conflicts are increasing. Military activity is presented as a cause of degraded "belligerent landscapes." Some damaged territories are then proposed as possible sites for educational, cultural, and historical activities. Finally, the conclusion declares that the study of war-affected soils, the forecasting of their restoration, and the determination of their possible economic use remain relevant.

These statements have the form of a general environmental commentary. They tell the reader that warfare is destructive, that modern weapons create complex damage, and that the subject

deserves further study. What they do not tell the reader is what was learned by reviewing 106 sources.

The Stated Objective Is Not Answered

The article defines its objective as being “to summarize the knowledge available in publications regarding the transformation of soils and their properties as a result of warfare.” A conclusion corresponding to this objective should summarize the available knowledge as knowledge. It should identify the content, structure, reliability, and limitations of the published evidence. Instead, the conclusion summarizes the phenomenon. It tells us that military activity affects soils, not what the literature demonstrates about those effects. The distinction is fundamental. “War damages soils” is a proposition about the world. “The literature provides relatively strong evidence of localized compaction on military training grounds, but much weaker and methodologically heterogeneous evidence concerning the long-term recovery of soils in active war zones” would be a conclusion derived from a review. “Explosions disturb soil profiles” is a general statement. “Available studies of explosion-related profile disturbance are concentrated in a small number of historical European battlefields and use incompatible morphological descriptions, making cross-site comparison difficult” would be a review conclusion. “Military contamination can remain for decades” is a thematic assertion.

“Persistent contamination has been documented for particular metals, explosive residues, and radionuclides at selected sites, but differences in sampling depth, background selection, soil properties, and analytical methods prevent general estimates of persistence” would be a synthesis of evidence. Gordienko’s conclusion repeatedly offers the first kind of statement and almost entirely omits the second. It therefore does not answer the article’s own research objective.

No Typology of the Reviewed Literature

The article lists 106 references, but neither its conclusion nor its methodology classifies them according to source type or evidentiary function. The bibliography includes markedly different forms of material:

- field studies of historical battlefields;
- investigations of military training grounds;
- studies of firing ranges and open-detonation sites;
- laboratory research on explosives and contaminants;
- soil-profile descriptions;
- geomorphological studies of craters;
- archaeological and historical research;
- remote-sensing assessments;
- institutional reports;
- books and reference works;
- journalistic and popular publications;
- web sources;
- generalized historical accounts;
- and numerical estimates whose methods are not clearly presented.

These materials cannot be treated as interchangeable units of evidence. A controlled laboratory experiment concerning the degradation of an explosive compound cannot establish the field-scale condition of an active battlefield. A study of a military firing range cannot

automatically represent a bombed agricultural region or destroyed industrial city. A satellite image can identify craters, trenches, fires, or land-cover change, but it cannot by itself determine contaminant mobility, bioavailability, or toxicity. A historical source may document the quantity of ammunition used without demonstrating the present chemical condition of soil. An institutional report can provide rapid evidence during a crisis, but its procedures, access conditions, and uncertainty may differ from those of a peer-reviewed field study. A review must not merely place these sources next to one another. It must identify what each source can and cannot establish. The conclusion does not do so. The 106 references appear as a single, undifferentiated accumulation of “experimental and theoretical knowledge.” Their number creates an impression of breadth, while their different evidentiary functions remain unexamined. Quantity substitutes for classification.

No Hierarchy of Evidence

The article draws upon several distinct levels of evidence:

- directly measured soil properties;
- laboratory measurements;
- modelled outcomes;
- estimates derived from secondary data;
- historical reconstructions;
- remote observations;
- visual descriptions;
- institutional reports;
- and unsupported or weakly supported assertions.

The conclusion does not distinguish among them. Measured bulk density at a defined depth and location is not epistemically equivalent to an estimated national area described as “affected.” A laboratory measurement of a contaminant is not equivalent to an assumption that a damaged structure contaminated the surrounding soil. A count of visible craters does not by itself establish the volume, severity, or ecological duration of soil degradation. A description of “complete devastation” is not a measurement unless the term has operational criteria. This distinction is central to the present case because the article combines precisely measured local findings with extremely broad territorial claims. Concentrations may be reported in analytical units and profile changes described by depth, while elsewhere millions of craters, hundreds of millions of cubic metres, or thousands of square kilometres are introduced without an equivalent explanation of method.

The conclusion should have ranked its findings by confidence. It should have stated which conclusions are supported by multiple independent field studies, which remain plausible but unverified, and which depend on a single source. It should have separated demonstrated effects from potential risks. Instead, all forms of evidence are compressed into the proposition that military activity causes degradation. The result is not synthesis but epistemic flattening.

Military Training Grounds Are Not War Zones

A substantial portion of the article’s empirical material comes from military bases, firing ranges, training grounds, and open-detonation sites. These are legitimate objects of environmental research, and they can illuminate certain mechanisms of military disturbance. They are not, however, equivalent to active or recently active war zones. Training areas often provide researchers with advantages that wartime territories do not:

- known territorial boundaries;
- repeated access;
- documented military activities;
- relatively stable land use;
- opportunities to select control sites;
- established monitoring arrangements;
- and the possibility of systematic sampling over time.

Active war zones may contain:

- moving front lines;
- mined and inaccessible territories;
- multiple overlapping contaminant sources;
- destroyed urban and industrial infrastructure;
- damaged water and sanitation systems;
- fires and uncontrolled releases;
- military secrecy;
- interrupted environmental monitoring;
- mass displacement;
- rapidly changing land use;
- and deliberate manipulation or suppression of information.

Evidence from a firing range may be valuable for understanding the accumulation of particular metals or explosive residues under repeated use. It cannot automatically represent the environmental complexity of a destroyed settlement, damaged refinery, flooded mine, burned agricultural landscape, or heavily mined front line. The conclusion never examines this imbalance. It does not ask how much of the available knowledge concerns actual warfare and how much concerns peacetime military activity. It does not warn readers that training grounds may dominate the literature because they are safer and easier to investigate. Consequently, evidence about military land use is silently converted into evidence about war.

No Geographical Map of Knowledge and Ignorance

The reviewed literature is geographically uneven. Certain locations and types of sites receive substantial attention: First World War battlefields in Western Europe, military ranges in the United States, Vietnam, former Yugoslavia, Kuwait, selected refugee camps, and several historical Russian or Soviet battlefields and defensive structures. Other conflict regions receive minimal treatment or appear through one or two secondary references. Ukraine, despite the scale and duration of the war, is represented through one Russian source rather than through a comparative body of Ukrainian and international research. Contemporary effects within Russia are omitted altogether. A review conclusion should have transformed this distribution into a finding. It could have stated that knowledge is concentrated in locations accessible to European and North American researchers, in historically significant battlefields, and at institutionalized military sites. It could have identified active contemporary conflicts as comparatively difficult to study because of insecurity, restricted access, damaged monitoring systems, and political constraints. Instead, the conclusion generalizes from a geographically selective corpus to warfare as a universal phenomenon.

The phrase “accumulated experimental and theoretical knowledge” suggests a coherent and sufficiently representative body of evidence. The article may indeed contain useful observations from particular sites. It does not demonstrate that these sites represent the global

diversity of war-affected soils. Without a geography of the literature, the geography of research is mistaken for the geography of the phenomenon.

No Typology of Soils

The conclusion also fails at the most basic disciplinary level: it says almost nothing about soils as differentiated natural bodies. As established earlier, only six soil taxa are explicitly named in the main text, and none structures the final synthesis. The conclusion speaks about “soil” and “soils” in general, as though the consequences of excavation, compaction, burning, metal deposition, petroleum release, radionuclide contamination, and abandonment could be interpreted independently of soil properties. A genuinely soil-centred conclusion should have asked:

- Which soil groups dominate the available studies?
- Which soils remain almost unstudied?
- Are agricultural mineral soils overrepresented?
- What is known about Histosols, saline soils, arid soils, wetland soils, mountain soils, forest soils, urban soils, or technogenic substrates?
- How do texture, pH, organic matter, mineralogy, drainage, carbonate content, and horizon structure affect contaminant mobility?
- How does soil moisture influence compaction?
- How does biological activity influence the degradation of explosive residues?
- Can findings obtained in one soil type be transferred to another?
- Which soils are likely to recover spontaneously, and which may require intervention?

None of these questions is answered. The conclusion therefore reproduces the article’s central conceptual weakness. Soil supplies the title and the disciplinary location, but differentiated soils do not organize the analysis.

An Inadequate Typology of Disturbance

The article organizes some of its material into physical, morphological, and chemical changes. This classification could have become the foundation of a useful synthesis. The conclusion might have evaluated which categories are best documented, how they interact, and where the classification itself becomes inadequate. Instead, the categories are incorporated into a simplified historical progression: ancient warfare supposedly produced mainly physical degradation, while modern warfare produces more severe morphological and chemical consequences. This model is too crude. Military disturbances do not occur in isolated analytical boxes. An explosion can simultaneously cause:

- displacement and mixing of horizons;
- crater formation;
- compaction at the crater margins;
- destruction of soil aggregates;
- heating;
- loss of vegetation and soil organisms;
- deposition of metal fragments;
- introduction of explosive residues;
- altered infiltration;
- accelerated erosion;
- and changes in subsequent pedogenesis.

A vehicle track may produce compaction, vegetation loss, reduced infiltration, altered runoff, erosion, and fuel contamination. Trench construction truncates and mixes horizons, changes drainage, exposes subsoil, and redistributes organic material. Fire affects organic matter, aggregate stability, hydrophobicity, nutrient availability, microbial communities, and erosion risk. Damage to industrial infrastructure produces chemical releases whose distribution is controlled by topography, hydrology, soil texture, and the physical destruction of containment systems. A meaningful synthesis would therefore present military impacts as interacting physical, morphological, chemical, hydrological, and biological processes. The conclusion instead preserves a set of broad labels without investigating their relationships.

Biological Degradation Disappears

The omission of biological processes is particularly serious. The article refers in passing to microbial biomass, vegetation, soil fauna, earthworms, organic-matter accumulation, and biodegradation. Nevertheless, biological transformation is not established as a major analytical category, and it disappears from the conclusion. This is difficult to reconcile with an understanding of soil as a living system. A review of war-affected soils should consider:

- changes in microbial diversity and functional activity;
- effects on decomposition and nutrient cycling;
- mortality and recolonization of soil fauna;
- damage to root systems and rhizosphere processes;
- plant–soil feedbacks;
- the biological transformation of explosive compounds;
- the recovery of vegetation and organic inputs;
- changes in soil carbon dynamics;
- and the restoration of ecosystem functions.

Without these dimensions, the article approaches soil principally as damaged material: something displaced, compacted, mixed, contaminated, or removed from economic use. The ecological functioning of soil receives no comparable synthesis. The conclusion thus speaks of severe soil destruction without defining what the destruction of a living soil system would mean or how it would be measured.

No Temporal Synthesis

Time is indispensable to understanding war-affected soils. Some effects are immediate but reversible. Others persist for decades. Still others may emerge gradually as contaminants move, structures corrode, mines flood, vegetation changes, or disturbed surfaces erode. The article contains observations spanning very different temporal scales:

- instantaneous crater formation;
- immediate horizon mixing;
- short-term erosion;
- compaction persisting for years or decades;
- soil development in old craters;
- contaminants remaining at historical battlefields;
- radionuclide redistribution;
- and continued exposure to metals or explosive residues long after military activity ends.

Yet these observations are never organized into a temporal framework. The conclusion does not distinguish among:

- immediate destruction;
- short-term instability;
- medium-term redistribution;
- delayed contamination;
- persistent chemical legacies;
- long-term pedogenesis;
- spontaneous recovery;
- partial functional recovery;
- and recovery dependent on active remediation.

It also does not distinguish repeated monitoring from one-time sampling. A contaminant detected fifty years after a battle demonstrates persistence at that location, but it does not by itself reveal the trajectory of change during the preceding fifty years. A single late measurement cannot show whether concentrations declined, migrated, became less bioavailable, or were redistributed into groundwater or vegetation. Given that long-term consequences constitute one of the central justifications for studying war-affected soils, the absence of temporal synthesis is a major failure.

Restoration Is Announced but Not Reviewed

The final sentence presents the study of restoration and future economic use as a continuing priority. However, restoration is not systematically reviewed in the paper. The article does not synthesize evidence concerning:

- mechanical decompaction;
- removal or containment of contaminated material;
- phytoremediation;
- microbial degradation of explosives;
- immobilization of metals;
- restoration of drainage;
- erosion control;
- reconstruction of soil profiles;
- replacement of organic matter;
- management of unexploded ordnance;
- safe return to agriculture;
- long-term monitoring;
- or criteria for declaring land restored.

Consequently, “restoration” appears as an aspiration rather than as a conclusion supported by the reviewed evidence. A defensible conclusion might have stated that research on disturbance is substantially more developed than research on recovery. It might then have identified restoration studies as an urgent deficit. Instead, the article invokes restoration without showing what is known about it.

No Assessment of Comparability

The reviewed studies differ in sampling depth, analytical method, spatial scale, soil classification, observation period, background selection, units of measurement, and regulatory context. These differences directly affect whether results can be compared. For example:

- total metal concentration is not equivalent to a mobile or bioavailable fraction;
- a national regulatory threshold is not automatically transferable to another country;

- surface sampling cannot be directly compared with sampling across a complete profile;
- a localized crater field cannot be equated with an area whose entire soil cover has been removed;
- a military range cannot be equated with a destroyed industrial landscape;
- the presence of a contaminant does not necessarily demonstrate ecological harm;
- and the absence of a contaminant at one sampling depth does not establish the absence of contamination from the soil system.

A critical review should identify such heterogeneity as one of the principal barriers to cumulative knowledge. It should specify which findings can be compared and which cannot. The conclusion says nothing about comparability. Heterogeneous observations are treated as parts of a single cumulative body of evidence simply because they concern military activity and soil.

Contradictions and Negative Findings Are Not Synthesized

The literature summarized in the article is not entirely uniform. The Gallipoli case, for example, reportedly found heavy-metal concentrations broadly comparable to background values despite intense historical warfare. This is scientifically important. It suggests that the presence and persistence of chemical signatures may depend upon:

- the types and quantities of munitions used;
- parent material and natural geochemical background;
- soil texture and mineralogy;
- drainage and leaching;
- erosion and sediment redistribution;
- climate;
- vegetation recovery;
- elapsed time;
- sampling design;
- and the chemical forms measured.

A critical review should use such findings to ask why persistent contamination is detected at some sites and not at others. Negative findings are not inconvenient exceptions to be discarded. They help identify the conditions under which a proposed relationship holds. The conclusion ignores this variation and maintains a one-directional narrative of severe and lasting degradation. Instead of explaining differences, it removes them from the synthesis.

No Consideration of Publication Bias

The body of published research is unlikely to represent all war-affected soils equally. Sites characterized by spectacular destruction, unusually high contaminant concentrations, iconic battles, accessible archives, or strong monitoring institutions are more likely to be investigated and published. This can produce several forms of bias:

- severely contaminated sites may be overrepresented;
- historically famous battlefields may receive disproportionate attention;
- accessible territories may be studied more often than dangerous ones;
- countries with greater scientific capacity may dominate the literature;
- positive findings may be more publishable than negative findings;
- and sites with rapid recovery may attract less attention than sites with persistent damage.

A collection of extreme cases cannot automatically establish the average or global effects of warfare. Nor can it support an estimate of how frequently complete destruction, irreversible contamination, or permanent land withdrawal occurs. The conclusion nevertheless employs categorical expressions such as “complete destruction,” “indefinite withdrawal,” and landscapes unsuitable for economic use. These concepts are not operationally defined, and the possibility that the literature overrepresents severe cases is not considered.

No Bibliographic or Linguistic Self-Assessment

The review includes Russian- and English-language publications, journal articles, books, institutional documents, and web materials. Yet it provides no transparent account of how this corpus was constructed. The reader is not told:

- which databases were searched;
- which languages were included;
- whether Ukrainian databases and publications were examined;
- which search terms were used;
- whether translated titles were checked;
- how duplicate or inaccessible sources were handled;
- whether citation chaining was employed;
- or how the relevance and quality of sources were assessed.

Because the corpus is not methodologically defined, its representativeness cannot be evaluated. This is particularly serious in the case of Ukraine. A single Russian publication becomes the basis of the article’s quantitative account, while Ukrainian war-related soil research is absent. A critical conclusion should have acknowledged linguistic and database selection as potential sources of bias. Instead, the literature selected by the author is implicitly presented as equivalent to the literature available to science.

No Conclusion About the Research Community

War-related soil research is produced by multiple expert communities: soil scientists, environmental chemists, geomorphologists, geographers, ecologists, microbiologists, historians, archaeologists, military researchers, public-health specialists, remote-sensing specialists, international organizations, government agencies, and journalists. These communities do not necessarily use the same concepts, spatial units, standards of evidence, or research objectives. Their findings may remain fragmented because they publish in different disciplinary environments and communicate through different institutional networks. A sophisticated review could have shown that fragmentation itself is one of the field’s central problems. It could have examined why historical research, soil chemistry, remote sensing, military geography, and restoration science remain poorly integrated. The conclusion does not consider who produces the knowledge or how disciplinary separation shapes it. The literature appears as a collection of decontextualized statements rather than as the product of differently situated expert communities.

“Further Research Is Needed” Is Not a Research Agenda

The conclusion declares that further study remains relevant. This statement is unobjectionable but analytically empty. Almost any review of any incomplete scientific field could end in the same way. A research agenda should identify concrete priorities. In this field, these might include:

- an operational definition of war-affected soil;
- standardized distinctions among direct, indirect, measured, estimated, and potential impacts;
- protocols for selecting baseline and control sites;
- harmonized sampling depths and analytical procedures;
- separate reporting of total, mobile, and bioavailable contaminant fractions;
- comparative studies across soil groups and climatic regions;
- long-term monitoring of recovery trajectories;
- integration of remote sensing with field sampling;
- systematic study of biological soil functions;
- investigation of contaminant mixtures rather than isolated substances;
- methodologies adapted to mined, inaccessible, and recently deoccupied territories;
- explicit uncertainty assessment;
- evaluation of remediation techniques;
- monitoring of contaminant transfer into crops, water, and food chains;
- and meaningful inclusion of researchers and institutions from affected countries.

The article offers no equivalent programme. It establishes that the subject deserves attention but does not determine what scientific work should follow.

The Unexpected Turn Toward Museums and Heritage

One of the most unusual passages in the conclusion proposes that some affected territories may be used for “educational and cultural historical events,” referring to the Borodino Military History Museum Reserve and the Kulikovo Field Museum Reserve. This recommendation does not follow from the evidence reviewed in the article. Historical battlefield reserves represent one possible form of land use under particular cultural, political, environmental, and safety conditions. They cannot serve as a general model for the future of:

- productive agricultural soils;
- destroyed settlements;
- contaminated industrial territories;
- minefields;
- refugee camps;
- radioactive sites;
- damaged forests and wetlands;
- or areas containing unexploded ordnance.

The article provides no criteria for deciding when preservation as a cultural landscape would be appropriate and when remediation, reconstruction, ecological restoration, agricultural recovery, or return to local communities should take priority. The proposal also risks naturalizing abandonment. A territory rendered unsafe or unproductive by modern warfare should not be casually reimagined as a commemorative or educational space merely because some historical battlefields have become museums. This passage reveals a striking displacement of scale and context. Russian historical museum reserves become a conceptual model for globally diverse landscapes affected by radically different wars, contaminants, land uses, and community needs. The conclusion moves from soil science to heritage management without building an analytical bridge between them.

Strong Language Without Operational Definitions

The conclusion uses expressions of high certainty and severity:

- complete soil destruction;
- severe bombturbation;
- highly hazardous contamination;
- indefinite withdrawal from use;
- and landscapes unsuitable for economic activity.

Yet none of these categories is operationally defined. What constitutes the “complete destruction” of a soil? Does it mean removal of the profile, irreversible loss of ecological function, contamination above a statutory threshold, destruction of agricultural productivity, or transformation into technogenic material? What is “indefinite withdrawal”? Does it mean that no foreseeable remediation technology exists, that remediation would be economically prohibitive, that legal restrictions have no specified endpoint, or simply that the duration has not been investigated? What makes an entire landscape unsuitable for economic activity? Is the judgment based on contamination, unexploded ordnance, destroyed infrastructure, access restrictions, or loss of soil function? Without definitions, these expressions cannot be consistently applied or tested. Their rhetorical force exceeds their analytical content. The conclusion does not reduce uncertainty. It amplifies selected descriptions.

What a Defensible Conclusion Could Have Said

On the basis of the material assembled in the article, a defensible synthesis might have read as follows: The reviewed literature is heterogeneous and is dominated by case studies of historical European battlefields, military training grounds, firing ranges, and a limited number of heavily contaminated conflict zones. Evidence is strongest for localized compaction caused by military vehicles, morphological disruption associated with excavation and explosions, and the accumulation of metals and explosive residues at firing and detonation sites. Evidence concerning biological change, differences among soil types, recovery trajectories, active contemporary conflicts, and the effectiveness of remediation remains limited and geographically uneven. Comparability is restricted by inconsistent definitions, sampling depths, background values, analytical procedures, spatial units, and observation periods. Future research should combine soil classification, field sampling, remote sensing, historical reconstruction, and long-term monitoring while distinguishing direct measurements from estimates, extrapolations, and indirect observations. Such a conclusion would remain cautious, but it would be scientifically useful. It would tell the reader:

- what kind of literature exists;
- where the evidence is strongest;
- where it is weakest;
- what prevents comparison;
- and what research is needed next.

Most importantly, it would be a conclusion that could only have been written after examining the literature.

The Decisive Test

The central conclusion of the published article can be reduced to three propositions:

- war damages soils;

- modern weapons create more complex damage than ancient warfare;
- further research and restoration are important.

All three propositions could have been formulated before consulting the 106 references. This is the decisive test. If the conclusion could be produced from general knowledge of the topic without conducting the literature review, it does not demonstrate the analytical contribution of the review. The problem is not that the conclusion is short. Brevity can coexist with synthesis. Nor is the problem that the conclusion uses general language. A general conclusion may be justified if it emerges transparently from a structured comparison of evidence. The problem is that the article arrives at generality by removing the distinctions that the review should have analyzed. It removes distinctions between:

- war zones and training grounds;
- measurements and estimates;
- soils and undifferentiated land;
- physical, chemical, and biological processes;
- local cases and global claims;
- persistent and temporary effects;
- strongly supported and speculative conclusions;
- represented and excluded regions;
- and available literature and merely selected literature.

The conclusion's apparent breadth is produced through loss of analytical resolution.

Central Diagnosis

The published conclusion confuses three different intellectual operations:

- describing the phenomenon;
- emphasizing its seriousness;
- and synthesizing scientific knowledge about it.

It performs the first two. It tells us that military activity damages soils and that the consequences can be severe. It does not perform the third. It does not tell us what the literature is, how it is distributed, what it measures, where it agrees, where it contradicts itself, what it cannot establish, which soils and territories remain unstudied, whose knowledge has been excluded, or what precise research programme should follow. The article concludes that the problem is important. It does not conclude what is known about the problem. For a scientific review, this is not a stylistic weakness at the end of an otherwise completed analysis. It is evidence that the central analytical work of the genre was never performed. The bibliography has been assembled, but not converted into a body of critically evaluated knowledge. The sources have been cited, but not organized by their evidentiary value. Examples have been accumulated, but not transformed into a comparative framework. The subject has been declared important, but the state of research has not been established.

The article therefore ends where a review should begin: with the general recognition that war affects soil and that the subject deserves investigation.

8 The genre mismatch

Question for deliberation: Which intellectual operations justify calling this text a review?

Evidence decision: The diagnosis of descriptive compilation is a reasoned genre assessment. Narrative review remains a legitimate alternative; absence of PRISMA reporting alone is insufficient grounds for rejecting it [R10, R11].

The weaknesses identified above raise a more fundamental question: what kind of scholarly text is Impact of War on Soils (a Review)? The answer is less obvious than its formal designation suggests. The paper is published as a review article in a professional soil-science journal. It contains an abstract, keywords, thematic sections, a conclusion, and 106 references. It states that its purpose is to summarize publications from 1950 to 2024 concerning the effects of military activity on soils. These features establish its administrative and bibliographic identity as a review. They do not establish that the intellectual work characteristic of a scientific review has actually been performed. When evaluated according to its internal organization, the text belongs to several other genres more convincingly than it belongs to the genre of a completed scholarly review. It resembles an encyclopedic overview, an extended student literature report, introductory lecture notes, a thematic dossier, and a preliminary collection of materials assembled before an analytical article has been written. The most precise general description is therefore:

a citation-supported descriptive compilation organized around the broad thematic association of war, military activity, land, and soil. This diagnosis does not mean that historical overviews, educational essays, or preliminary literature dossiers are inherently illegitimate. Each can have a useful purpose. The problem arises because the text has been presented, reviewed, published, translated, and indexed as something more: a scientific synthesis of existing knowledge. The genre mismatch is therefore not merely terminological. It concerns the kind of intellectual work that readers have been institutionally assured was completed.

A Review Is Defined by Operations, Not Appearances

A scientific review is not defined simply by the number of references it contains. Nor is it created by placing the word “review” in parentheses after the title. The defining feature of a review is the set of operations performed upon a body of literature. Relevant publications must be identified, selected, classified, compared, evaluated, and synthesized. A review should explain not only what individual publications say but what becomes visible when those publications are examined together. A descriptive literature report commonly proceeds as follows:

- one author investigated a particular site;
- another reported a particular concentration;
- a third described a historical conflict;
- another study found compaction;
- elsewhere, researchers identified heavy metals;
- another publication discussed craters;
- and a further source reported long-term contamination.

This structure demonstrates that literature has been collected. It does not demonstrate that the literature has been reviewed in the analytical sense. A scientific review should reorganize individual findings around higher-order questions:

- Which effects are consistently observed?
- Under what environmental and military conditions do they occur?
- Which findings have been independently reproduced?
- Which conclusions depend on isolated cases?

- Which methods produce comparable results?
- Which differences may be explained by soil properties?
- Which findings contradict one another?
- What geographical and disciplinary biases characterize the evidence?
- What can the literature establish with confidence?
- What remains uncertain?
- What conceptual model emerges from the comparison?

Gordienko's article largely performs the first operation. It reports, lists, and illustrates. It rarely performs the second. Citations document the existence of sources. They do not automatically demonstrate synthesis. A text can contain 106 references and still remain a compilation.

A Chronological Essay on the History of Warfare

A substantial part of the article is organized as a broad history of warfare. It moves through the ancient world, the Middle Ages, the early modern period, the world wars, Vietnam, Yugoslavia, Chechnya, Ethiopia, Gaza, and the war in Ukraine, although the latter is politically and geographically obscured as a conflict in "Eastern Europe." The historical sections discuss such matters as:

- the increasing scale of warfare;
- the development of weapons;
- the use of artillery and aviation;
- troop movement;
- fortification construction;
- changes in battlefield geography;
- the expansion of explosive power;
- chemical warfare;
- nuclear weapons;
- and the increasing capacity of military technologies to alter landscapes.

This material produces a narrative of historical escalation. Ancient warfare is associated mainly with localized physical disturbance. The development of artillery and industrial warfare increases the scale and depth of morphological transformation. Twentieth-century warfare adds synthetic chemicals, radionuclides, petroleum products, and other persistent contaminants. As a framework for an introductory lecture, this progression is intelligible. It helps a general audience understand that the environmental effects of war have changed with military technology. As the main organizing logic of a scientific soil review, however, it is insufficient. The historical periodization is not derived from an explicit comparison of soil evidence. Its categories are not operationally defined. It is not demonstrated that ancient warfare produced only, or even primarily, physical effects, nor that modern warfare can be characterized through a simple addition of chemical contamination. Ancient military activity also changed vegetation, erosion, settlement, agriculture, and biological processes. Modern military impacts cannot be reduced to chemical additions, because they simultaneously involve excavation, compaction, fires, altered hydrology, destruction of infrastructure, land abandonment, and biological disruption.

The chronological narrative provides continuity, but continuity is not synthesis. It arranges events in time without constructing a systematic explanation of how different soils respond to different disturbances under different conditions. The historical material consequently functions mainly as exposition.

An Encyclopedic Overview

The article also resembles an encyclopedia entry because it introduces a large number of loosely connected topics:

- anthropogenic soil formation;
- SUITMAs;
- military geography;
- belligerent landscapes;
- trenches and defensive earthworks;
- crater formation;
- bombturbation;
- military training grounds;
- soil compaction;
- heavy metals;
- explosive compounds;
- herbicides;
- napalm;
- chemical warfare agents;
- nuclear weapons;
- radionuclides;
- forest fires;
- refugee camps;
- and the long-term preservation of military features in landscapes.

The dominant compositional movement is expansive. A topic is introduced, briefly described, supported by one or more references, and then replaced by another topic. This is a recognizable encyclopedic structure:

- name a phenomenon;
- provide a short definition or description;
- present one or more examples;
- attach citations;
- move to the next phenomenon.

Such organization can be useful for readers encountering a subject for the first time. It demonstrates the breadth of the topic and introduces relevant terminology. It may function effectively as a teaching aid or general orientation document. A scientific review, however, should eventually move beyond the succession of topics. It should return to the examples and determine how they relate to one another. It should identify patterns, conditions, contradictions, and limits. The paper rarely performs this return. Once an example has served its illustrative purpose, it usually disappears from the argument. The cases are accumulated horizontally but not integrated vertically into a model of knowledge.

Lecture Notes Expanded into Prose

The architecture of the article also strongly resembles introductory lecture notes. A lecture entitled “The Impact of War on Soils” might reasonably contain:

- an opening statement about the importance of soil;
- a historical overview of warfare;
- famous examples from different conflicts;

- a division into physical, morphological, and chemical effects;
- lists of possible pollutants;
- memorable numerical claims;
- photographs or descriptions of craters and trenches;
- references to nuclear, chemical, and conventional weapons;
- several geographically diverse case studies;
- and a final statement that the subject deserves greater attention.

This is essentially the architecture of the article. Its most prominent rhetorical devices are also typical of educational presentations:

- dramatic historical examples;
- striking numbers;
- broad contrasts between ancient and modern warfare;
- lists of weapons and contaminants;
- rapid movement among countries and periods;
- and categorical statements emphasizing the seriousness of destruction.

These techniques can be pedagogically effective. They create interest and give an audience a preliminary map of the topic. But lecture notes are normally the beginning of scholarly work rather than its final form. To become a publishable scientific review, this material would need to be transformed through:

- a clearly formulated review question;
- a transparent search and selection procedure;
- a defined corpus of relevant studies;
- an explicit analytical framework;
- comparison of methods and results;
- assessment of evidence quality;
- identification of uncertainty;
- and conclusions about the state of research.

That transformation is not visible in the published article. The text therefore has the breadth of an introductory lecture but not the analytical discipline of a scientific review.

A Preliminary Research Dossier

Another useful genre comparison is the preliminary research dossier. At an early stage of research, an author may collect:

- potentially relevant references;
- striking quotations;
- numerical claims;
- historical examples;
- candidate concepts;
- individual case studies;
- definitions;
- and materials requiring later verification.

At this stage, inconsistency is normal. Some sources will eventually prove irrelevant. Others will be unreliable. Categories may overlap. Figures may not yet have been checked against their original sources. The researcher may not yet know which examples are representative or which conceptual structure will organize the final article. The dossier becomes scholarship only

through a second stage of work. Sources are verified. Irrelevant material is removed. Claims are traced to their origins. Cases are classified. Comparable evidence is separated from merely associated information. Contradictions are examined. The argument is reconstructed around what the evidence can support. Several features of Gordienko's article suggest that the text remained at the dossier stage:

- the figure of 121,406 km² was included without verifying what it measured;
- different meanings of soil were not separated;
- six soil taxa were mentioned without becoming part of the analysis;
- military ranges and active war zones were combined without methodological distinction;
- historical narrative was placed beside soil measurements without clarifying their evidentiary relationship;
- estimates, direct measurements, and general assertions were not differentiated;
- Ukrainian soil expertise was not incorporated;
- contradictory or negative findings were not synthesized;
- and the conclusion did not evaluate the state of the literature.

The article reads as though the collection of material was mistaken for the completion of research. This diagnosis is more precise than simply calling the article "weak." The text contains substantial material. What it lacks is the analytical stage that would convert collected material into a review.

A Citation Collage

A sharper description of the article's evidentiary form is "citation collage." A collage combines fragments taken from different contexts. The fragments remain recognizable, but their original relationships, scales, and functions may be weakened or lost when they are placed together. The article combines:

- measurements from military ranges;
- descriptions of historical battlefields;
- general histories of warfare;
- figures concerning military land;
- environmental reports;
- archaeological observations;
- institutional assessments;
- books and encyclopedic sources;
- web publications;
- and politically framed accounts of contemporary conflicts.

These fragments are connected primarily by topical proximity. They all concern some combination of war, military activity, soil, land, environmental degradation, or contamination. But topical proximity does not establish analytical compatibility. The error concerning 121,406 km² is the clearest demonstration of this mechanism. A figure describing the real-estate portfolio used by the United States Department of Defense could be placed into a sentence about the global area affected by war because both the source and the sentence involved the terms "military" and "land." The numerical conversion was correct, while the category was false. The same associative logic operates more broadly:

- a firing range is placed beside an active battlefield because both involve munitions;
- a refugee camp is placed beside crater morphology because both occur in conflict-related settings;

- military land ownership is placed beside war-related soil destruction because both concern land connected with armed forces;
- historical fortifications are placed beside contemporary contamination because both represent military effects on landscapes;
- nuclear testing and wartime nuclear attacks are discussed within the same general thematic field despite major differences in context and evidence.

The collage creates the appearance of breadth. It does not establish that the fragments answer the same question.

A Catalogue of Examples

The article's principal compositional unit is not an argument, comparison, or evidence table. It is the example. Examples are drawn from Fort Riley, Fort Benning, Verdun, Kursk, Stalingrad, Vietnam, Yugoslavia, Chechnya, Gaza, Tigray, Donbas, Hiroshima, Nagasaki, military ranges, refugee settlements, and historical defensive structures. Examples are essential to scientific writing when they clarify or test an argument. In this article, however, examples frequently replace the argument. The text rarely explains:

- why a particular case was selected;
- whether it is representative or exceptional;
- what population of cases it represents;
- whether it can be compared with adjacent examples;
- which variables account for similarities or differences;
- and what general conclusion follows from the comparison.

The reader receives a succession of illustrations of the proposition that military activities affect land and soil. The number and diversity of examples produce an impression of accumulated confirmation. Yet the examples have not been organized in a way that would permit generalization. This creates a catalogue rather than a synthesis.

Why It Is Not a Systematic Review

The article cannot be classified as a systematic review because it provides none of the methodological information necessary for reproducibility. It reports:

- no bibliographic databases;
- no search strings;
- no date of search;
- no language restrictions;
- no inclusion criteria;
- no exclusion criteria;
- no duplicate-removal procedure;
- no screening process;
- no number of records initially retrieved;
- no number of excluded records;
- no reasons for exclusion;
- no quality-assessment procedure;
- no structured extraction protocol;
- and no method of synthesis.

The statement that publications from 1950 to 2024 were considered does not constitute a method. Nor does the claim to cover “all known military conflicts globally.” Such language describes an aspiration of extraordinary breadth without explaining how it could have been achieved or verified. Indeed, the visible omissions make the universal claim particularly implausible. A corpus that does not meaningfully include Ukrainian research on war-damaged Ukrainian soils cannot credibly be presented as a global review of all known conflicts.

Is It a Narrative Review?

The most charitable conventional classification is “narrative review.” Narrative reviews do not necessarily use the rigid protocols associated with systematic reviews. They may employ flexible search strategies, provide historical background, address a broad subject, and organize material through the author’s interpretive framework. However, “narrative” does not mean that anything associated with a topic may be assembled without explanation. A competent narrative review still requires:

- a clear purpose;
- a recognizable rationale for source selection;
- critical engagement with evidence;
- conceptual organization;
- comparison among studies;
- and conclusions derived from the reviewed literature.

The category “narrative review” therefore only partially fits. It describes the absence of a systematic protocol but does not adequately capture the absence of synthesis. A more precise designation would be: an unsystematic descriptive narrative survey. This formulation recognizes the paper’s broad thematic and historical narrative while refusing to treat description as equivalent to review.

The Missing Transformation

The article contains many elements from which a valuable review could have been constructed:

- an important and insufficiently investigated subject;
- a large international bibliography;
- historical and contemporary examples;
- evidence concerning mechanical and chemical disturbance;
- studies of military ranges and battlefields;
- the concept of bombturbation;
- and material spanning short- and long-term effects.

The principal problem is not the absence of raw material. It is the failure to transform that material. A completed review would have required an additional analytical stage:

- formulate a defined review question;
- reconstruct and document the source corpus;
- remove irrelevant or unreliable materials;
- verify central numerical claims;
- classify source and study types;
- distinguish active warfare from military training;
- identify the soil groups actually investigated;

- separate direct measurements from estimates and observations;
- compare methods and findings;
- analyze contradictions and negative results;
- evaluate geographical, linguistic, and political bias;
- map gaps in knowledge;
- construct a temporal model of disturbance and recovery;
- and rewrite the conclusion as a synthesis of the literature.

The published paper appears to precede this stage. It presents the materials from which a review might be written as though the presence of those materials meant that the review had already been completed.

Genre Mismatch as an Editorial Failure

The classification of the text matters because journals apply different evaluative standards to different genres. An introductory essay may be evaluated according to clarity, breadth, relevance, and pedagogical value. A historical overview may be judged by narrative coherence and factual accuracy. A lecture may use simplified categories and memorable examples to orient an audience. A preliminary dossier may legitimately contain unresolved questions and provisional classifications. A review article must additionally demonstrate that a body of literature has been selected appropriately, evaluated critically, and transformed into knowledge about the state of the field. By publishing the manuscript as a review, the journal invited readers to assume that these operations had been performed. The genre mismatch therefore indicates more than an authorial weakness. It suggests a failure of genre recognition during editorial assessment. Reviewers and editors should have asked whether the manuscript represented a completed review or only preliminary material for one.

They should also have asked which evaluative standard they were applying. If the article was assessed as a general educational overview, its breadth and topical relevance may have appeared sufficient. If assessed as a scientific review, the absence of method, comparison, evidence evaluation, and synthesis should have been decisive. The article appears to have received the institutional status of the second genre while being evaluated according to the less demanding expectations of the first.

Scopus Indexing and the Administrative Identity of Knowledge

Scopus indexing does not certify the quality of every individual article. It indexes content from journals admitted to its database according to its own selection and monitoring procedures. Nevertheless, within academic practice, indexing often functions as an informal marker of legitimacy. Researchers, institutions, conference participants, and evaluation systems commonly infer that an article in a Scopus-indexed journal has passed an appropriate level of disciplinary review. The inference may not be logically warranted, but it is socially powerful. In the present case, all the expected external markers are present:

- a professional journal;
- a specialized disciplinary title;
- an abstract;
- keywords;
- scientific terminology;
- 106 references;
- a formal conclusion;

- a DOI;
- an English-language version;
- an institutional publishing apparatus;
- and inclusion in a major bibliographic database.

Internally, however, the operations expected of a review are largely absent. The text possesses the administrative identity of scientific synthesis without fully possessing its epistemic structure. This distinction is central to understanding how the imitation of knowledge becomes difficult to distinguish from knowledge itself. The article does not look unfinished. Publication has supplied the signs of completion. Formatting, citation, translation, journal placement, pagination, DOI assignment, and indexing collectively convert a preliminary-looking compilation into a finished scholarly object.

A Precise Genre Diagnosis

It would be imprecise to claim simply that the article is “not scientific.” The text cites scientific studies and contains scientifically relevant material. Such a broad accusation would also distract from the more demonstrable problem. The defensible formulation is narrower: Although formally published as a review article, Impact of War on Soils functions as an unsystematic descriptive compilation. Its dominant mode is expository rather than analytical: it arranges historical episodes, individual case studies, pollutant lists, and striking numerical claims around the general theme of war and soil, but does not transform this material into a critical synthesis of the literature. A sharper formulation is also possible: The manuscript resembles the preparatory stage of a review—the stage at which references, examples, quotations, numerical claims, and possible categories have been collected—but not the subsequent stage at which those materials are verified, classified, compared, and converted into knowledge about the state of the field. The genre can therefore be classified at several levels: The shortest defensible conclusion is:

It is a review by label, a compilation by method, and an introductory lecture by structure. Historical narrative, examples, definitions, and introductory explanations are not inappropriate in a review. Strong review articles frequently contain all of them. The problem is that, in this case, exposition remains the final product. The analytical work that should have converted exposition into a scientific review was not completed before the text acquired all the institutional marks of completed scholarship.

9 How imitation of knowledge becomes published knowledge

Question for deliberation: How can scholarly authority accumulate while a source mismatch remains?

Evidence decision: The visible outcome supports ineffective verification in this case. Claims about what two reviewers privately did are not established. Journal-level indexing is distinct from sentence-level validation [R9, R15].

The purpose of this case study is not merely to demonstrate that one article is weak. Weak publications can be found in every discipline, country, language, and publishing system. Nor is the purpose to speculate about the author’s private motives, the unpublished history of the manuscript, or circumstances that cannot be established from publicly available evidence. The more important question is institutional: How can a text containing an elementary source error, no reproducible review method, almost no soil-specific synthesis, a politically selective bibliography, and conclusions that do not assess the state of knowledge pass through every

formal stage of scholarly certification? The answer cannot be reduced to the competence or intentions of one person. Publication is not an individual act. It is the outcome of a chain involving authorship, editorial screening, peer review, revision, translation, production, dissemination, indexing, reading, and citation. Impact of War on Soils has passed through this chain successfully. It has acquired all the conventional attributes of legitimate scholarship:

- a socially important subject;
- placement in a professional soil-science journal;
- an abstract and keywords;
- disciplinary terminology;
- thematic classification;
- quantitative claims;
- 106 references;
- formal peer review;
- an English translation;
- a DOI;
- journal pagination and metadata;
- and visibility through an indexed publication system.

These attributes create a powerful presumption of credibility. Yet close examination reveals that the relationship between these formal signals and the actual production of reliable knowledge has broken down. The significance of the case lies precisely in that separation.

The Weakness Is Systematic

The problem is not confined to the false interpretation of one number. The figure of 121,406 km² is especially useful because its origin can be reconstructed and the error demonstrated with unusual clarity. But it is only one visible symptom. The article's deficiencies occur at every major level of review production. The central global estimate does not measure the area of soils affected by warfare. It derives from a popular account of the real-estate portfolio used by the United States Department of Defense. Approximately 30 million acres were converted correctly into square kilometres, but the meaning of the original quantity was replaced. The article is nominally about soils, yet it does not define soil as its research object. Only six identifiable soil taxa appear in the main text, and none is used to organize comparison. "Soil" alternately means land, surface, excavated earth, profile, substrate, agricultural resource, and container for pollutants. The review claims exceptionally broad temporal and geographical coverage, but it provides no databases, search terms, selection criteria, screening procedure, quality assessment, or method of synthesis.

The discussion of the war against Ukraine relies on a single Russian source for its principal quantitative claims, while Ukrainian expertise on war-affected Ukrainian soils is absent. Contemporary Russian territory disappears from the environmental geography of the same war, even though the article accepts indirect evidence of probable soil disturbance in other conflicts. The conclusion does not synthesize the literature. It repeats that warfare damages soil, that modern weapons create severe effects, and that further research is necessary. Any one of these problems might be dismissed as an oversight. Their combination cannot be explained so easily. Together, they demonstrate that the manuscript was not subjected to an effective process of intellectual verification. Its weakness is not accidental noise surrounding an otherwise functioning review. The weakness is organized across the entire structure of the paper.

Producing a Publication and Producing Knowledge

Academic institutions frequently treat the production of a publication and the production of knowledge as though they were the same process. Ideally, they should be closely connected. In practice, they can become separated. The production of knowledge requires:

- a defined object of inquiry;
- a researchable question;
- appropriate and sufficiently representative evidence;
- transparent methods;
- verification of sources and claims;
- meaningful comparison;
- recognition of uncertainty;
- and conclusions that follow from the analysis.

The production of a publication requires a partly different set of achievements:

- a manuscript of acceptable form and length;
- a topic that appears relevant;
- recognizable scholarly sections;
- disciplinary vocabulary;
- a sufficient number of references;
- compliance with journal formatting;
- completion of editorial and review procedures;
- technical preparation;
- and successful dissemination.

In a functioning scholarly system, the second process should certify that the first has occurred. The published object should be the visible result of completed intellectual work. But the correspondence is not automatic. A manuscript can satisfy the administrative requirements of publication without satisfying the epistemic requirements of knowledge production. The present article appears to occupy exactly this space. It is complete as a publication object but incomplete as an act of inquiry. Nothing is missing from its external form. It has a beginning, thematic sections, citations, a conclusion, references, metadata, and publication history. It looks finished because the publishing process has finished processing it. What remains incomplete is the research operation itself.

The Economy of Scholarly Signals

The article succeeds because it contains signals that academic institutions and readers have learned to recognize quickly. “War” signals moral and social importance. “Soil degradation” signals disciplinary and environmental relevance. “Review” signals comprehensive engagement with previous research. “One hundred and six references” signals breadth. Precise numbers signal measurement. Technical terminology signals expertise. An English-language version signals international circulation. Peer review signals validation. A DOI signals permanence. Indexing signals legitimacy and discoverability. Each signal is real at the administrative level. The article genuinely has references, numbers, sections, terminology, an English version, a DOI, and indexed visibility. The problem lies in the conclusions drawn from those signals. The existence of a citation is taken to mean that the cited source supports the claim. A precise number is taken to mean that the quantity has been measured or validly estimated. The word “review” is taken to mean that a defined body of literature has been

critically reviewed. The completion of peer review is taken to mean that central claims have been checked.

Publication in a specialist journal is taken to mean that disciplinary standards have been applied. Indexing is taken to mean that the individual article has achieved a high level of scientific quality. None of these inferences is necessarily valid. The 121,406 km² claim demonstrates the distinction with exceptional clarity. The sentence has everything required to look scientific: a precise number, a percentage, a global comparison, a catastrophic interpretation, and a citation. Only one element is missing: the cited source does not support what the sentence says. The claim therefore possesses the visible signs of evidence without possessing the underlying evidentiary relationship. This is the basic mechanism through which the imitation of knowledge operates. It does not necessarily invent every component. It preserves the exterior form of a scientific claim while disconnecting that form from the intellectual practices it is supposed to represent.

Distributed Trust and Disappearing Responsibility

Modern scholarship depends on distributed trust. No reader can personally reproduce every experiment, inspect every field site, verify every calculation, and open every cited source. Scientific communication would be impossible without a reasonable division of labour. Authors are expected to represent sources accurately. Reviewers are expected to examine the manuscript critically. Editors are expected to select appropriate reviewers and evaluate their recommendations. Translators and language editors are expected to preserve meaning. Publishers are expected to maintain reliable procedures and accurate records. Indexing services evaluate journals and make their content discoverable. Readers rely on these institutional filters while retaining responsibility for critical interpretation. Distributed trust becomes dangerous when every participant assumes that substantive verification has occurred elsewhere. The author may assume that the citation is adequate because a source has been attached. A reviewer may assume that a precise number has been checked by the author. A second reviewer may focus on a different aspect of the interdisciplinary manuscript. The editor may assume that the reviewers have examined the essential claims.

The translator may treat an accepted source text as scientifically settled. The production team may understand its responsibility as technical rather than epistemic. The publisher may regard editorial acceptance as sufficient authorization for dissemination. An indexing service may assess the journal rather than the individual article. Readers may rely on the journal's title, peer-review status, and indexation. Every participant can therefore act in accordance with a limited procedural role while the central claim remains unverified. Trust is distributed across the chain, but responsibility is dispersed until it becomes difficult to locate. The manuscript accumulates authority at each stage without necessarily receiving corresponding intellectual scrutiny.

Peer Review as Procedural Completion

Peer review is often imagined as a mechanism that directly establishes whether an article is correct, rigorous, original, and valuable. In practice, peer review is a limited institutional procedure. Its quality depends on reviewer selection, available time, disciplinary competence, editorial expectations, and the willingness to verify claims rather than merely assess plausibility. A broad interdisciplinary paper creates particular risks. A soil scientist may concentrate on terminology concerning soil while assuming that the military history is accurate. A military historian may recognize historical examples but lack the expertise to assess

contaminant chemistry. An environmental chemist may examine lists of pollutants without analyzing the political framing of contemporary conflicts. A reviewer familiar with historical battlefields may not evaluate the representativeness of Ukrainian sources. Each reviewer may focus on the elements closest to their own competence. The spaces between those competences can remain unexamined. Interdisciplinarity then produces not collective expertise but distributed blind spots.

However, the most important error in this article did not require specialized expertise. Detecting the false global-area claim required only opening reference 59 and comparing the quantity described by the source with the quantity described in the manuscript. The source concerns military-administered real estate. The manuscript represents the same figure as the total area of the Earth affected by wars. No advanced knowledge of soil science, military geography, or statistical analysis is needed to identify the substitution. It is a basic source-verification task. The survival of this error indicates that the presence of a citation was accepted in place of verification of the citation. Peer review was evidently completed as a procedure. Its epistemic function was not effectively performed.

What reviewers with complementary expertise should have examined

The article's passage through peer review is particularly difficult to explain because its problems are visible at several different levels. A reviewer concerned with source validity should have examined the global-area estimate. A reviewer concerned with review methodology should have asked for databases, search terms, inclusion criteria, and a description of the selection process. A soil scientist should have asked which soils were being compared and why soil properties did not structure the analysis. A reviewer of contemporary conflicts should have questioned the treatment of Ukraine, the dependence on one Russian source, and the absence of Ukrainian research. A reviewer concerned with evidence quality should have required distinctions among field measurements, estimates, historical reconstructions, institutional reports, and general assertions. A reviewer concerned with synthesis should have asked what conclusions the article reached about the literature rather than about warfare in general. These are not alternative criticisms requiring a single reviewer to possess universal expertise. They are basic questions corresponding to the manuscript's declared genre and subject.

The retention of the error demonstrates that the process did not secure an effective correction. It is consistent with a gap between formal review and substantive verification; the private reports and reasoning of reviewers are not known.

Editorial Responsibility Cannot Be Delegated Completely

Editors do not independently verify every sentence in every manuscript. That would be impossible. They do, however, remain responsible for the architecture of evaluation. An editor decides whether a submission fits the journal, whether its genre is correctly identified, what expertise its evaluation requires, whether reviewers' reports are sufficient, and whether revision has resolved fundamental problems. The breadth of Impact of War on Soils should have required especially careful editorial attention. The paper spans soil science, military history, geography, environmental chemistry, archaeology, war studies, and contemporary geopolitics. Such breadth increases, rather than reduces, the need to define the review's method and boundaries. The editor should have asked:

- Can the claim to global coverage be supported?
- Is the literature-selection process reproducible?

- Are the principal numerical claims verified?
- Does the paper distinguish soil from land?
- Are different categories of military sites analytically separated?
- Does the conclusion synthesize the literature?
- Is the account of a contemporary war bibliographically and politically adequate?
- Does the manuscript meet the journal's standard for a review article?

If reviewers did not address these matters, editorial responsibility did not disappear. It became more important. Peer review advises. Editorial acceptance certifies.

Indexing as Retrospective Legitimation

Scopus does not independently verify every assertion in every article it indexes. Its principal evaluative object is the journal and its publication practices, not the factual accuracy of each sentence. Nevertheless, "Scopus-indexed" is widely treated as a shorthand description of the quality of an individual article. This creates a process of retrospective legitimation. The sequence is simple:

- the article is accepted by a journal;
- the journal's indexed status extends institutional credibility to the article;
- the article becomes internationally discoverable;
- other researchers find and cite it;
- citations increase its visibility;
- visibility is interpreted as relevance;
- relevance may later be interpreted as evidence of quality or influence.

At no stage does this sequence necessarily require anyone to reopen reference 59 or verify the original meaning of 30 million acres. Indexing did not create the initial error. It changed the error's institutional status. Before publication, the claim was a sentence in a manuscript. After publication and indexing, it became a searchable, citable, internationally distributed scholarly statement. Its presence in the literature can then be used as evidence in later reviews, lectures, reports, conference presentations, or policy discussions. The publication system gives persistence and mobility not only to knowledge but also to error.

The Moral Importance of the Topic as Protection from Criticism

The environmental consequences of war are an urgent and insufficiently studied subject. Precisely for that reason, publications addressing it may receive a sympathetic reception. Researchers who believe the topic has been neglected may welcome a new article because it expands the visible field. The first question becomes: Is someone finally writing about war and soil? The more demanding question is postponed: Is this publication producing reliable knowledge about war and soil? This produces a dangerous substitution. Thematic recognition is treated as scholarly achievement. The existence of an article becomes evidence of progress, even when the article does not establish what is known. Moral urgency can therefore protect weak research from criticism. A critic may appear to be challenging the importance of the problem rather than the quality of its treatment. Colleagues may hesitate to question a publication that draws attention to environmental destruction during war. But the importance of the subject should lead to stronger standards, not weaker ones.

Poor evidence can exaggerate some effects, obscure others, misdirect research, normalize political omissions, and give decision-makers a false impression that the field is more

developed than it is. It can also damage the credibility of legitimate research when visible errors are later exposed. Critical evaluation does not diminish the topic. It protects it.

Citation Without Critical Reading

The reception of the article by other scholars forms part of this case. Researchers may cite it as evidence that war-related soil damage is an important field of inquiry without examining its sources, methodology, or conclusions. In such use, the article functions symbolically. Its title proves that the topic exists. Its placement in a soil-science journal proves that the topic belongs to soil science. Its 106 references suggest that an extensive evidence base exists. Its Scopus visibility suggests that the evidence has passed professional review. The citation may therefore signal relevance rather than engagement with a specific finding. This is a common practice in academic writing. References are not always used to support a precise proposition. They may mark disciplinary membership, demonstrate awareness of a field, or establish that a subject has previously been discussed. The paradox is striking: A paper that fails to review the literature critically can itself be cited without critical review.

The original weakness is then reproduced through readership. A publication becomes influential not because its analysis has been tested, but because its existence satisfies the need for a citable source on an important subject.

What “Imitation of Knowledge” Means

The phrase “imitation of knowledge” does not mean that every sentence in the article is false. Many individual statements may be correct. Many of the cited studies may be valuable. Some descriptions may offer useful entry points into the subject. The imitation occurs at the level of structure and function. The article imitates comprehensiveness through the number of references. It imitates global coverage through geographically dispersed examples. It imitates measurement through precise figures whose conceptual meaning is not verified. It imitates methodological organization through the division into physical, morphological, and chemical effects. It imitates soil-specific analysis by repeatedly using the word “soil” without differentiating soils. It imitates critical synthesis through a section titled “Conclusions.” It imitates international scholarship through translation, journal publication, DOI assignment, and indexation. Each component resembles an element of scientific knowledge production. What is absent is the set of relationships that should connect the components. The citation does not necessarily support the claim. The example is not necessarily representative. The categories are not consistently applied. The selected literature is not shown to represent the available literature.

The conclusion does not follow from a synthesis. The imitation is therefore not a simple fabrication. It is a more ordinary and potentially more dangerous process: fragments of real information are assembled into the recognizable form of knowledge without adequate verification, comparison, or integration.

Absence of Correction Is Not Evidence of Validity

The lack of public objections cannot be treated as confirmation that the article is sound. Post-publication criticism faces a severe asymmetry of effort. Producing an unsupported claim may require one sentence. Demonstrating why it is unsupported can require:

- locating the original source;
- reconstructing a calculation;

- comparing categories;
- checking terminology;
- examining the bibliography;
- identifying omitted literature;
- and anticipating possible objections.

The burden of correction is far greater than the burden of error. Silence may also result from:

- limited readership;
- superficial reading;
- confidence in journal procedures;
- diffusion of responsibility;
- fear of professional conflict;
- political sensitivity;
- lack of incentives for critical replication;
- and the absence of formal mechanisms for post-publication review.

Scientific communities often reward new publications more strongly than the examination of existing ones. An article criticizing a basic error may require extensive work while appearing less original than the text that introduced the error. The absence of correction therefore does not show that specialists found no problem. It may show that no part of the system was designed to reward the act of checking.

The Article as a Case Rather Than a Personal Target

The article should be treated as a case study, not merely as a target of denunciation. The object of criticism is a publication ecology in which:

- authorship does not by itself guarantee source verification;
- peer review can become procedural;
- editing can remain formal;
- translation can add authority without adding validation;
- vague AI disclosure can introduce uncertainty without clarifying responsibility;
- indexing can be mistaken for article-level certification;
- and readers can recognize a relevant topic without evaluating the work performed.

This focus is methodologically important. Claims about motives or hidden production histories would require evidence that is not available in the published text. The present criticism requires no such speculation. The evidence is public:

- the article;
- its claims;
- its references;
- its bibliography;
- its omissions;
- its conclusion;
- and its publisher’s note.

The case is powerful precisely because its central defects can be demonstrated without confidential correspondence, access to editorial files, or knowledge of private intentions. If problems this visible passed through the system, less visible problems may pass even more easily.

From Failure to Investigate War to Failure to Investigate Knowledge

The broader conference theme concerns expert communities, war, involvement, responsibility, and the failure to investigate long-term consequences. This article reveals a second-order failure. The first failure is insufficient investigation of the long-term environmental effects of war. The second is insufficient investigation of the knowledge produced about those effects. A research field may appear active because publications exist. Yet publication volume does not demonstrate that the relevant questions are being answered. There may be:

- articles without reliable estimates;
- references without source verification;
- reviews without review methods;
- soil studies without differentiated soils;
- global claims without representative evidence;
- and conclusions without conclusions about the literature.

The production of texts can therefore conceal the absence of investigation. This is particularly dangerous in a new or fragmented field. When few authoritative syntheses exist, a weak review can become a central reference simply because it is available. Its categories, omissions, and errors can then structure subsequent discussion. The literature grows, but knowledge does not necessarily accumulate.

Institutional Success and Epistemic Failure

The most disturbing feature of Impact of War on Soils is not any single error. It is the article's complete institutional success. The manuscript was submitted. It passed editorial screening. It was reviewed. It was accepted. It was translated. It was edited and typeset. It was published. It was indexed. It became discoverable. It was read and cited. At each stage, it acquired additional authority. Yet its fundamental weaknesses remained visible and uncorrected. The case demonstrates that a publication system can function administratively while failing epistemically. Manuscripts are processed, reviews are recorded, issues are released, DOIs are activated, databases are updated, and citations accumulate. Every formal operation is completed. From the outside, nothing appears broken. But the completion of procedures is not the production of knowledge. The difference becomes visible only when someone performs the elementary intellectual work that the chain was presumed to have performed already: opening a source, checking what a number means, examining whose research is absent, distinguishing soil from land, comparing evidence types, and asking whether the conclusion actually follows from the literature.

Central Conclusion

The case changes the question that must be asked. The initial question is: How was such a weak article published? The more important question is: What kind of publication system makes the weakness of an article irrelevant to its successful publication? A weak manuscript is an individual event. A system capable of repeatedly transforming weak manuscripts into institutionally certified knowledge is an institutional problem. The article demonstrates how this transformation can occur. Relevance substitutes for a research question. References substitute for source evaluation. Precise numbers substitute for validated measurement. thematic categories substitute for analytical structure. Peer review substitutes for visible verification. Indexing substitutes for article-level quality assessment. Citation substitutes for critical reading. At the end of the process, all the signs of knowledge are present. The

knowledge-producing practices they are supposed to signify are not. When academic institutions evaluate the signs of scholarship more reliably than the practices that produce it, imitation can become institutionally indistinguishable from knowledge.

In research concerning war, this distinction is not merely academic. The evidence concerns destroyed environments, contaminated land, food production, public health, responsibility, remediation, reconstruction, and consequences that may persist across generations. A publication system that cannot reliably distinguish knowledge from its imitation does not merely produce weak literature about those consequences. It becomes part of the failure to investigate them.

10 Translation AI disclosure and responsibility

Question for deliberation: What do the translation credit and conditional AI notice actually disclose?

Evidence decision: The credit and notice appear on the publisher record [R1]. They do not prove that AI caused a particular error or establish which language version reviewers evaluated.

The final page of Impact of War on Soils contains two statements that require separate examination: “Translated by G. Ermakova.” and: “AI tools may have been used in the translation or editing of this article.” These statements initially appear peripheral. They follow the bibliography and do not form part of the substantive argument. Yet they raise important questions about the production of the published English text, the transparency of the publication process, and the location of responsibility for errors. The central issue is not whether translation or artificial intelligence is inherently problematic. Neither is. The issue is whether the publication provides enough information to establish what happened to the manuscript and who accepted responsibility for its final form.

The Meaning of “Translated by G. Ermakova”

The statement that the article was translated by G. Ermakova indicates that the English-language text is not the original linguistic version of the manuscript. This is not in itself unusual or improper. Many journals originating in non-English academic systems publish translated English editions. In such arrangements, an article may first exist in Russian, pass through editorial procedures associated with a Russian-language journal, and subsequently be translated for international distribution. The English-language publication is therefore not necessarily a manuscript originally submitted by the author to an English-language editorial office. This distinction matters. An ordinary reader encountering the article in Eurasian Soil Science may reasonably assume that the author prepared an English-language review for an international scientific readership and that the English text was evaluated in the form in which it appears. The statement “Translated by G. Ermakova” suggests a more complex chain:

- an original text existed in another language;
- that text underwent some form of authorial and editorial preparation;
- an English translation was produced;
- the translation may have been edited;
- the translated version was published and internationally indexed.

The statement does not, however, explain at which stage substantive peer review occurred. It does not tell readers whether reviewers evaluated the original Russian text, the English

translation, or both. Nor does it state whether the author reviewed and approved the final English version. These questions are especially important because the final English text contains claims whose problems might theoretically arise at different stages.

Translation Error or Source Error?

When a questionable statement appears in a translated article, several possibilities must be distinguished. The original manuscript may already have contained the error. The translator may have misunderstood the original sentence. An editor may have altered the meaning during language revision. An automated system may have introduced a change. Or an initially ambiguous statement may have become more categorical in translation. These possibilities cannot simply be collapsed. The false claim concerning 121,406 km² is a useful example. The number corresponds almost exactly to the conversion of approximately 30 million acres into square kilometres. The cited source discusses land used or controlled by the United States Department of Defense. The published article represents this quantity as the total global area affected by warfare. This is not the kind of discrepancy that can be explained easily as a minor grammatical problem. It involves a substitution between two research objects:

- military-administered real estate;
- and territory environmentally affected by war.

A translator might theoretically intensify or distort an ambiguous formulation. But the published text presents the category substitution as part of a complete scientific claim, connects it to a global percentage, and uses it to support the assertion that soil damage is catastrophic despite the supposedly small affected area. Without access to the original-language version and a comparison of the two texts, one cannot determine at which stage the substitution entered the manuscript. It would therefore be improper to assign the error personally to the translator. But this uncertainty does not make the published claim less erroneous. Nor does it eliminate institutional responsibility. The scientific record contains the English version. The publisher disseminated it. The journal's readers encounter it as an authoritative review. Responsibility for the accuracy of the final publication cannot be suspended merely because more than one person or tool may have participated in its production.

Translation Is Not Scientific Verification

Translation and scientific review perform different functions. A translator is generally responsible for preserving meaning across languages. A scientific reviewer is responsible for evaluating, within reasonable limits, the validity, relevance, and adequacy of the scholarly content. A language editor improves expression. A scientific editor makes decisions about whether the manuscript meets the journal's standards. These roles may overlap in practice, but they should not be confused. A translator cannot be expected to reconstruct the research behind every claim unless source verification is explicitly included in the task. If the original manuscript incorrectly describes military property as war-affected land, a faithful translation may reproduce that error accurately. Conversely, a scientifically correct source text can be damaged by an inaccurate translation. For that reason, someone must verify the final translated version before publication. The critical question is therefore not whether translation occurred. It is whether the publishing system included an effective mechanism for confirming that:

- scientific terminology retained its meaning;
- political and geographical categories were not distorted;
- quantities and units remained correct;

- claims continued to correspond to their references;
- and the author's conclusions were not altered or strengthened unintentionally.

The article provides no information about such verification.

The Peculiar Wording of the AI Notice

The second statement is more unusual: "AI tools may have been used in the translation or editing of this article." The key phrase is "may have been used." This is not a clear declaration that AI tools were used. It is not a declaration that they were not used. It does not identify who used them, for which task, or under what conditions. The statement leaves open several questions:

- Were AI tools actually used?
- If so, which tools?
- Were they used for the full translation or only for selected passages?
- Did a human translator prepare the initial translation and then use AI for revision?
- Was machine translation produced first and subsequently checked by a named translator?
- Did the publisher use automated language-editing software after the translator completed the text?
- Were substantive sentences rewritten?
- Were references, terminology, and numerical claims checked after AI-assisted editing?
- Did the author approve the final English text?
- Who is responsible if the AI-assisted version differs materially from the original?

The notice answers none of them. A meaningful disclosure should reduce uncertainty about the production of a text. This notice increases uncertainty.

Disclosure Without Information

The statement has the form of transparency but provides almost no auditable information. A useful disclosure might state:

- the name or type of tool used;
- the operation for which it was used;
- the parts of the manuscript affected;
- whether the output was checked by a human translator or editor;
- whether the author approved the final version;
- and who retains responsibility for accuracy.

By contrast, "may have been used" describes a possibility. It does not establish an event. This creates a peculiar form of institutional disclosure: the publisher alerts readers to possible technological intervention while declining to specify whether that intervention occurred. The notice therefore functions less as an account of the article's production than as a generalized reservation. It tells the reader that the final language may not be entirely attributable to the named translator, the author, or a conventional editor. At the same time, it provides no basis for determining which wording came from which participant.

Is the Notice an Attempt to Blame AI?

It would be too strong to conclude that the publisher explicitly attributes possible errors to artificial intelligence. The notice does not say: "The publisher is not responsible for errors introduced by AI." Nor does it formally release the author, translator, editor, or publisher from

responsibility. Therefore, the proposition that the notice means “if something is wrong, AI is to blame and we are not responsible” cannot be established literally from the wording alone. However, the practical effect of the statement can resemble a diffusion of responsibility. If a problematic phrase is found, several explanations become available:

- perhaps it was present in the original;
- perhaps it was introduced in translation;
- perhaps it resulted from editing;
- perhaps an AI tool produced it;
- perhaps a human failed to correct the AI output.

Because the notice specifies none of these stages, responsibility becomes harder to trace. The disclaimer does not directly blame AI, but it creates an undefined zone in which linguistic agency and accountability are uncertain. That uncertainty benefits every human participant in the publication chain because no one is clearly identified as responsible for the final formulation. The appropriate criticism is therefore not that the publisher has formally blamed AI. It is that the notice introduces the possibility of AI involvement without establishing a corresponding chain of human accountability.

AI Is Not an Author and Cannot Bear Responsibility

An AI tool cannot accept scholarly responsibility. It cannot sign an authorship declaration, respond ethically to criticism, approve corrections, or guarantee that its output corresponds to cited sources. Responsibility must remain with identifiable human and institutional participants. If AI-assisted translation was used, someone had to decide to use it. Someone had to provide the source text. Someone had to accept or modify the output. Someone had to verify the terminology. Someone had to compare the translation with the original. Someone had to approve the final version for publication. AI participation does not remove these acts. It adds another stage requiring supervision. The relevant standard should therefore be straightforward: The use of AI may alter the method of translation or editing, but it cannot alter the location of responsibility for the published text.

The author remains responsible for the scientific claims attributed to the author. The translator or language editor remains responsible for the professional task they accepted, according to its defined scope. The editor remains responsible for publication decisions. The publisher remains responsible for the integrity of the final published version and for establishing procedures adequate to the technologies it permits. A machine cannot become the endpoint of accountability.

The Publisher’s Neutrality Statement

The AI notice follows another standard statement: “Pleiades Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.” Publisher neutrality statements are common in international academic publishing. They are generally intended to prevent the publisher’s reproduction of a map, boundary, territorial designation, or institutional affiliation from being interpreted as an official geopolitical endorsement. However, such a statement does not make the language of an article politically neutral. The article does not merely reproduce a disputed map or institutional address. It describes the war through particular categories. It refers to “the conflict between Ukraine and the Donetsk and Lugansk republics,” avoids identifying Russia as a belligerent in the key contemporary passage, and relies on a source using the term “special military operation.” These are not simply

jurisdictional claims embedded in a map. They are substantive framing decisions within the scholarly narrative. A generic neutrality statement cannot neutralize them.

Publisher neutrality should mean that territorial terminology is handled transparently and consistently. It should not mean that politically consequential language escapes editorial analysis because the publisher has declared itself neutral. Neutrality is not achieved by refusing to examine framing. Unexamined framing generally preserves the categories supplied by the more institutionally powerful source.

Responsibility at Each Stage

The publication chain can be represented through distinct responsibilities. The author is responsible for:

- the research question;
- selection and interpretation of sources;
- factual claims;
- calculations;
- bibliography;
- conceptual structure;
- and conclusions.

The reviewers are responsible for:

- assessing whether the paper meets the standards of its declared genre;
- identifying major unsupported claims;
- evaluating methodological adequacy;
- and requiring correction where the evidence is insufficient.

The editor is responsible for:

- selecting appropriate reviewers;
- recognizing the manuscript's interdisciplinary requirements;
- evaluating whether reviewer reports address its central weaknesses;
- and making the final publication decision.

The translator is responsible, within the agreed scope of the task, for:

- accurate transfer of meaning;
- consistent terminology;
- preservation of qualifications and uncertainty;
- and avoidance of substantive distortion.

The publisher is responsible for:

- defining translation and AI-use procedures;
- ensuring that the final published version has been approved;
- maintaining transparent attribution;
- and correcting the scholarly record when substantive errors are demonstrated.

An AI tool has no independent responsibility. Its use creates additional responsibilities for the humans and institutions deploying it. The failure of one participant does not automatically release the others.

A Disclosure Standard Adequate to Scholarly Responsibility

If AI tools were used in translation or editing, a responsible disclosure should provide enough information to preserve accountability. At minimum, it should state:

- whether AI was actually used;
- the general type or identity of the tool;
- the task for which it was used;
- whether it affected the full article or selected passages;
- who reviewed the output;
- whether the translated version was compared with the source text;
- whether the author approved the final text;
- and who accepts responsibility for accuracy.

Such a statement need not be long. It must simply replace possibility with information. For example: “The English translation was prepared by G. Ermakova with the assistance of an automated translation tool. The translator reviewed and revised the complete output, and the author approved the final English version. Responsibility for the scientific content remains with the author and the journal.” Whether this exact procedure occurred is unknown. The example merely demonstrates what meaningful disclosure would look like. By comparison, “AI tools may have been used” provides no stable basis for accountability.

Central Conclusion

The statement “Translated by G. Ermakova” is not evidence of misconduct or poor quality. Translation is a legitimate and often essential part of international scholarly communication. The AI notice is also not proof that artificial intelligence introduced any particular error. The defensible conclusion is more precise: The article’s closing notices reveal an insufficiently transparent production chain. A named human translator is followed by a statement that unidentified AI tools may have participated in translation or editing, but the publisher does not say whether they were actually used, what they did, who verified the resulting text, or who approved the final version. This ambiguity cannot transfer responsibility away from human participants. Nor can it explain the article’s major methodological, bibliographic, and conceptual failures. The central problem is not that a machine may have touched the text. The central problem is that the final text—whatever combination of human translation, automated assistance, and editorial intervention produced it—was published without effective verification. Translation increased the article’s international reach. Indexing increased its visibility. The publisher’s notices did not establish accountability proportionate to that expanded authority.

AI is therefore not the cause to which the article’s defects can conveniently be assigned. It is another point in a publication chain whose participants must remain responsible for the scholarly object they collectively produced. A scientific publication cannot have distributed production and ownerless errors.

11 Conclusions and the minimum standard

Question for deliberation: What may be concluded and what remains open when this analytical stage is closed?

Evidence decision: The main conclusion concerns imitation of knowledge across the whole publication, supported by the combined analysis of object definition, evidence selection,

verification, genre and synthesis. The numerical mismatch is an especially transparent example. Attribution of private motives remains outside that conclusion.

This case study began with an elementary discrepancy. A scientific review stated that the total area of the Earth affected by wars amounted to 121,406 km², or 0.024% of the planet's surface. The cited source did not measure war-affected territory. It reported approximately 30 million acres associated with the global real-estate portfolio of the United States Department of Defense. The conversion from acres to square kilometres was correct. The meaning of the number was not. This error is important not primarily because it produced an incorrect global estimate. Its greater value is diagnostic. It reveals what did not happen during the preparation, review, editing, translation, and reception of the article. The source mismatch remains in the published authorial text. Whatever the reviewers examined or recommended, the final published record retains the mismatch. The final editorially accepted version retains the unsupported claim. The disseminated English version retains the problem; its origin in drafting, translation or editing has not been established. The publisher disseminated the statement in an internationally accessible version. Indexing made it discoverable and citable.

Readers subsequently treated the article as evidence that the subject of war-related soil damage had received scientific attention. A claim unsupported by its source therefore passed through every principal stage of scholarly certification and emerged as part of the scientific record. If this were the article's only weakness, it might be treated as a serious but isolated citation error. It is not. The same lack of verification and differentiation appears throughout the paper.

What the Case Does and Does Not Prove

A single article cannot establish the prevalence of inadequate review practices across soil science, Russian academic publishing, Scopus-indexed journals, or scientific publishing generally. This case does not demonstrate that all articles in the journal are weak. It does not establish that indexing is meaningless. It does not show that peer review never works. It does not demonstrate that every cited source in the paper is unreliable. It does not allow conclusions about private motives or undocumented circumstances surrounding the manuscript. And it does not imply that the study of war-affected soils is scientifically illegitimate. On the contrary, the importance of that field is one reason why the quality of its literature requires close examination. The case establishes something narrower but still consequential: A text displaying major and readily verifiable defects was able to acquire the complete institutional status of internationally indexed scientific knowledge. The article demonstrates the possibility of certification without effective verification. It also allows the mechanism of that certification to be reconstructed from publicly available evidence.

This is sufficient to challenge a widespread assumption: that the formal completion of peer review and indexation can be treated as evidence that the central intellectual operations of scholarship have occurred.

One Case Can Reveal a Mechanism

The fact that only one article is examined does not make the case analytically trivial. A case study cannot determine statistical frequency, but it can reveal a mechanism. If a bridge collapses because a required inspection was formally recorded but not substantively performed, one does not need evidence that every bridge has collapsed before investigating the inspection system. Similarly, one demonstrable case can show that:

- the presence of a citation does not guarantee correspondence between source and claim;
- peer review does not guarantee that even central sources have been opened;
- a large bibliography does not guarantee comprehensive or balanced coverage;
- disciplinary terminology does not guarantee that the research object has been defined;
- a section titled “Conclusions” does not guarantee synthesis;
- and indexing does not guarantee the quality of an individual article.

The case does not prove how often these substitutions occur. It proves that the publication system allowed them to occur together in one article without preventing successful publication. The number and interdependence of the defects matter. A typographical error may survive because no system is perfect. A complete pattern of conceptual, methodological, bibliographic, geographical, and synthetic weakness requires a broader explanation.

The Difference Between Error and Organized Non-Verification

Scientific work inevitably contains errors. The relevant standard is not perfection. It is whether scholarly procedures are designed and applied in ways likely to detect consequential problems. The false area estimate could have been detected by opening one cited source. The absence of a review methodology could have been detected by reading the methods section—or observing that no adequate methods section existed. The disappearance of soil types could have been detected by asking what kinds of soils the review compared. The exclusion of Ukrainian expertise could have been detected by examining the bibliography. The absence of contemporary Russian impacts could have been detected by applying the article’s own inclusion logic consistently. The failure of synthesis could have been detected by asking what the conclusion said about the literature. None of these checks would have required access to confidential data, replication of laboratory experiments, or months of specialist investigation. They concern the visible structure of the published text. The issue is therefore not simply that errors occurred. It is that several elementary verification practices appear not to have been performed effectively.

This is organized non-verification: not necessarily a coordinated or intentional decision to avoid scrutiny, but a publication process whose division of labour allows scrutiny to disappear between stages.

Toward a Minimum Standard for Reviews of War-Affected Soils

The case points toward a minimum standard for future reviews in this field. A credible review should:

- define what counts as a war-affected soil;
- distinguish soil from land, territory, landscape, and military property;
- state the review question explicitly;
- disclose databases, languages, search terms, dates, and selection criteria;
- classify sources by evidentiary type;
- distinguish active warfare from training, testing, and military land use;
- identify the soils and soil properties investigated;
- separate direct measurements from estimates, modelling, and visual observation;
- evaluate geographical and linguistic bias;
- include or explicitly discuss the absence of affected-country expertise;
- compare methods, sampling depths, background values, and analytical units;
- report contradictions and negative findings;

- distinguish contamination from exposure, risk, and functional degradation;
- integrate physical, morphological, chemical, hydrological, and biological effects;
- organize evidence across immediate, medium-term, and long-term consequences;
- assess what is known about recovery and remediation;
- identify the limitations of the evidence;
- and derive a specific research agenda from those limitations.

These requirements are not excessive. They describe the minimum intellectual transformation that distinguishes a scientific review from a collection of information.

From a Critique of One Article to a Question About Science

The central question is no longer why one author made one error. Nor is it sufficient to ask why reviewers and an editor failed to correct it. The deeper question concerns the criteria by which a text becomes recognizable as scientific knowledge. If institutional recognition depends mainly on visible markers—references, terminology, numerical precision, standard sections, peer-review status, English translation, DOI assignment, and indexation—then a text can accumulate scientific authority while remaining analytically unfinished. At that point, the publication system no longer consistently distinguishes between two very different objects:

- knowledge produced through definition, verification, comparison, and synthesis;
- and a text that reproduces the external appearance of those operations.

This is the point at which the imitation of knowledge becomes institutionally effective. The imitation does not have to deceive every reader. It only has to pass through the required procedures. Once it does, later participants have strong incentives to rely on the certification already granted. The journal trusts the reviewers. The publisher trusts the journal. The database trusts the publisher's journal-level procedures. The reader trusts the database and the journal. The citing author trusts the published article. At each step, trust is understandable. Across the complete chain, it can produce a result for which no participant accepts full epistemic responsibility.

Final Proposition

Impact of War on Soils is significant because its presentation has the ordinary institutional appearance of a scientific review. Nothing about its presentation announces failure. It looks exactly as certified scientific knowledge is expected to look. Its weakness becomes visible only when the external signs of scholarship are suspended and the underlying operations are examined directly. What does the number measure? What does the source say? What is meant by soil? Which soils were studied? How was the literature selected? Whose knowledge is included? Whose knowledge is absent? Which findings are comparable? What remains uncertain? What conclusions actually emerge from the reviewed literature? The article does not provide adequate answers. The case therefore supports a broader conclusion: Scientific reliability cannot be inferred from the completed appearance of a publication. It depends on whether identifiable acts of verification, differentiation, comparison, and synthesis have actually been performed. The failure identified here is not simply the publication of an incorrect number or an inadequate review. It is the successful conversion of an analytically unfinished text into a fully certified unit of scientific knowledge.

That conversion required more than an author. It required a publication system willing to recognize the signs of scholarship without reliably testing the practices behind them, and a scholarly community prepared to cite thematic relevance without examining evidentiary quality.

When this occurs in research on war, the consequences extend beyond academic standards. A field devoted to investigating long-term destruction begins by failing to investigate its own claims. The result is not merely ignorance. It is ignorance bearing the institutional form of knowledge.

Bibliographic additions that strengthen this case

The incomplete entry for Balyuk and colleagues is resolved by the Ukrainian journal's own record. The article addresses general soil degradation and land-degradation neutrality; it must not be relabelled as wartime field research. Its fourth author is V. V. Shymel, rather than an inferred author with a different initial [R5].

Solokha and colleagues published Soil Degradation and Contamination Due to Armed Conflict in Ukraine on 4 October 2024, before Gordienko's submission on 31 March 2025. The authors include researchers affiliated with Ukrainian soil-science and agroecological institutions. This supplies a concrete example of pre-submission material relevant to the question of omitted wartime expertise [R13]. Its existence does not establish the completeness of a Ukrainian corpus or validate all its findings. Its full methods and findings are not re-audited here. The numbered publisher bibliography of Gordienko's review does not list this title.

The 2022 UNEP preliminary review is a further source available within the target review's stated temporal range [R14]. It is an institutional preliminary assessment, not interchangeable with a peer-reviewed soil sampling study. It is relevant as a source-selection comparator, not as proof of every local contamination pathway discussed in the dossier.

SANRA is included to distinguish a defensible critique of narrative-review reasoning from an inappropriate demand that every review be systematic [R10]. PRISMA is cited only to identify the reporting standard for systematic reviews [R11]. WRB supplies a reference for classification terminology [R12]. The Scopus policy and journal page establish the level at which indexing is represented [R9, R15]. COPE's guidelines distinguish correction from retraction; the protocol does not issue a retraction decision [R16].

Decision closing the current analytical stage

The case is closed at this stage as a complete analytical protocol rather than converted into a shortened conventional article. The main accepted analytical conclusion is that the target text is an imitation of review knowledge: it possesses the visible apparatus of a scientific publication without adequately performing the work needed to convert selected material into reliable synthesis. Publication makes it appear that a body of knowledge exists where an analytically unfinished compilation has been certified. This conclusion concerns the quality and epistemic function of the whole work, not merely one incorrect citation. The number is a tracer because its category substitution makes one failed operation unusually easy to inspect; the full dossier establishes the broader pattern through unstable soil definitions, source dependence, selective geography, weak comparison and absent synthesis.

The institutional conclusion is that the publication system successfully admitted and disseminated this low-quality work under the recognizable form of scientific knowledge. Administrative success and epistemic achievement came apart. That is the central result of the case. The conclusion is bounded by its evidentiary scope: it does not establish intentional deception, identical institutional motives or a general frequency of failure. Those limits prevent

a claim about hidden intentions; they do not reduce the whole-work diagnosis to a citation erratum.

Publication should preserve the dossier and its references together. A subsequent author response, editorial correction or verified contradiction should be linked to the protocol and evaluated on its content. No correspondence with Gordienko, the journal, the publisher or Scopus is represented here as having taken place. The suggested request for clarification in the presentation remains a proposed next action rather than an accomplished event.

Changes from the earlier manuscript

- Changed the publication form from a conventional critical article to a protocol with a complete analytical record.
- Preserved all eleven analytical blocks and their detailed questions, examples and arguments; consolidated short paragraphs for readability rather than abridging the dossier.
- Added explicit evidence decisions, alternative explanations, rejected inferences and an analytical closure decision.
- Restored three missing numerical formulae and clarified the approximate input, the denominator and the difference between reconstruction and documented calculation history.
- Replaced categorical assertions about private reviewer behaviour with statements about the published outcome.
- Distinguished narrative-review standards from systematic-review reporting and differentiated the six soil names across classification traditions.
- Completed Balyuk's reference, added a pre-submission Ukrainian wartime-soil publication and relevant methodological and institutional sources.
- Separated the present protocol from article 86, the slide deck and the earlier protocol at article 96; none is treated as independent corroboration of another.
- Retained the original laboratory attribution while identifying the different institutional credit on the conference record and presentation.

Open questions

- At what stage did the real-estate quantity acquire the war-affected-area label? Comparison with the source-language article is required.
- What did reviewer reports and editorial correspondence say about the estimate and review genre? These documents are not available in this record.
- Can the six-category count and the exact pattern of Ukraine citation placement be reproduced from an archived full English text with passage locations?
- Which missing sources would materially change the target review's synthesis, and under what explicit selection rules?
- Has a linked correction, response or other notice been issued? The protocol does not certify the absence of all such notices.
- Should the target publication be corrected in a limited way or examined more broadly under the journal's procedures? This requires an editorial assessment proportionate to the demonstrated errors.
- How often does the proposed mechanism occur beyond this case? A multi-case design is required; this dossier supplies no frequency estimate.

Protocol responsibility statement

Artificial intelligence assisted with structuring the protocol, comparing public bibliographic records, reconstructing calculations and proposing editorial revisions. The expert supplied the case materials, defined the research problem and requested preservation of the detailed analysis. AI is not an author, a witness to an undocumented meeting or a substitute for source verification.

The human author retains responsibility for judgments, factual accuracy, acceptance or rejection of interpretations, final authorship and authorization of publication. The present version is submitted for that review. It does not claim that the human author has already approved every new formulation or that publication has already been authorized.

References and case materials

The R identifiers below refer to this protocol's bibliography. References 2, 11 and 59 mentioned in the analytical record refer to Gordienko's numbered list. These two numbering systems must not be conflated. Web records were consulted on 12 October 2026; records may change after that date.

R1 Gordienko, O. A. (2025). Impact of War on Soils (a Review). Eurasian Soil Science, 58, article 127. https://doi.org/10.1134/S1064229325601209.

Role in this protocol: Target publication. Publisher metadata, abstract, references and notices checked; the full main text is represented through the supplied earlier audit.

R2 Sicard, S. (2022, August 15). How much land does the military really own? Military Times. https://www.militarytimes.com/off-duty/military-culture/2022/08/15/how-much-land-does-the-military-really-own/.

Role in this protocol: The source cited as reference 59. Its subject is military real estate, not global war-damaged soil.

R3 Visual Capitalist. (2022, July 27). How Much Land Does the U.S. Military Control in Each State? https://www.visualcapitalist.com/how-much-land-does-the-u-s-military-control-in-each-state/.

Role in this protocol: Related infographic identified in the supplied presentation and linked by Military Times. Direct retrieval was unsuccessful in this revision; its content is not a separately verified environmental dataset.

R4 National Institute of Standards and Technology. (n.d.). U.S. Survey Foot: Revised Unit Conversion Factors. https://www.nist.gov/pml/us-surveyfoot/revised-unit-conversion-factors.

Role in this protocol: Unit-conversion reference. International and U.S. survey acres are distinguished; the small distinction does not alter the category-error finding.

R5 Balyuk, S. A., Medvedev, V. V., Vorotintseva, L. I., & Shymel, V. V. (2017). Suchasni problemy dehradatsii gruntiv i zakhody shchodo dosiahnennia neitralnoho yii rivnia [Modern problems of soil degradation and measures to achieve its neutral level]. Visnyk Ahrarnoi Nauky, 95(8), 5–11. https://doi.org/10.31073/agrovisnyk201708-01. [In Ukrainian.]

Role in this protocol: Resolved title and DOI of Gordienko's reference 2. General degradation study; not recategorized as wartime field evidence.

R6 Drozd, G. Ya. (2023). Physical and mechanical degradation of soils due to military actions in the area of a special military operation. Vesti Avtomobilno-Dorozhnogo Instituta, 4, 24–33.

Role in this protocol: Bibliographic transcription of Gordienko's reference 11. Original title language and full text were not independently verified; no DOI is invented. The supplied dossier analyses its role in Gordienko, not a newly audited Drozd dataset.

R7 Laboratory of Information Systems. (2026). How a Citation Error Became Certified Knowledge. Pollution and Diseases. Published 20 September 2026. https://doi.org/10.66659/x54z0f84. https://pollution-diseases-ojs.org/index.php/pd/article/view/86.

Role in this protocol: Earlier public conference record. Same case; not independent replication.

R8 Nikolaenko, D. (2026). Why Were There No Papers on War-Affected Soil at a Conference on the Effects of War on Soil. Protocols of Expert-AI Scientific Inquiry. Version 1.0. Pollution and Diseases. Published 29 September 2026. https://doi.org/10.66659/rpharj84. https://pollution-diseases-ojs.org/index.php/pd/article/view/96.

Role in this protocol: Protocol-form comparator. OJS lists Dmitry Nikolaenko as author; the PDF cover credits the Laboratory of Military Ecotones and is dated 28 September 2026. The metadata distinction is retained.

R9 Eurasian Soil Science. (n.d.). Journal homepage and abstracting and indexing information. Springer Nature Link. https://link.springer.com/journal/11475.

Role in this protocol: The journal lists SCOPUS among its indexing services. This does not document the verification of any individual numerical claim.

R10 Baethge, C., Goldbeck-Wood, S., & Mertens, S. (2019). SANRA—a scale for the quality assessment of narrative review articles. Research Integrity and Peer Review, 4, article 5. https://doi.org/10.1186/s41073-019-0064-8.

Role in this protocol: Methodological comparison for narrative-review quality. No numerical SANRA score or validation for soil-science reviews is claimed.

R11 Page, M. J., et al. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ, 372, n71. https://doi.org/10.1136/bmj.n71.

Role in this protocol: Reporting framework for systematic reviews; not a universal condition for all review genres.

R12 IUSS Working Group WRB. (2022). World Reference Base for Soil Resources. International soil classification system for naming soils and creating legends for soil maps. Fourth edition. International Union of Soil Sciences, Vienna. https://www.isric.org/sites/default/files/WRB_fourth_edition_2022-12-18.pdf.

Role in this protocol: Reference for distinguishing WRB groups from names used in other classification traditions.

R13 Solokha, M., Demyanyuk, O., Symochko, L., Mazur, S., Vynokurova, N., Sementsova, K., & Mariychuk, R. (2024). Soil Degradation and Contamination Due to Armed Conflict in Ukraine. Land, 13(10), 1614. https://doi.org/10.3390/land13101614.

Role in this protocol: Concrete pre-submission comparator with Ukrainian institutional participation. Publication metadata and topic verified; this protocol does not independently validate every result.

R14 United Nations Environment Programme. (2022). The Environmental Impact of the Conflict in Ukraine: A Preliminary Review. https://wedocs.unep.org/handle/20.500.11822/40746.

Role in this protocol: Institutional preliminary assessment, distinguished from local soil field measurements.

R15 Elsevier. (n.d.). Scopus content policy and selection. https://www.elsevier.com/en-gb/products/scopus/content/content-policy-and-selection.

Role in this protocol: Source-selection and monitoring policy at title level; used to distinguish indexing from validation of individual claims.

R16 Committee on Publication Ethics. (2019). Retraction guidelines. https://doi.org/10.24318/cope.2019.1.4.

Role in this protocol: Framework for assessing unreliable findings and distinguishing retraction from other corrective actions; no retraction decision is made here.

R17 Laboratory of Military Ecotones. (n.d.). War Affected Soils and the Imitation of Knowledge: A Critical Case Study of Evidence Omission and Scholarly Certification. Supplied English manuscript.

Role in this protocol: Primary analytical dossier used to prepare this protocol; not assigned a separate publication date or DOI.

R18 Nikolaenko, D. (2026). How a Citation Error Became Certified Knowledge. Conference presentation prepared for P&D Conference, Prague, 15–17 October 2026. Laboratory of Information Systems. Sixteen-slide supplied English deck.

Role in this protocol: Prepared presentation, not a claim that the future talk had already been delivered on the protocol completion date.