Active Deforestation Risk Assessment Methodology for Cocoa

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The collaboration and commitment of Taskforce members have been instrumental in developing this methodology and advancing a more harmonized and credible approach to deforestation risk assessment in the cocoa sector.

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1 Introduction

The growing momentum towards sustainability regulations—including the European Union Regulation on Deforestation-Free Products (EUDR), the forthcoming Corporate Sustainability Due Diligence Directive (CSDDD), the Corporate Sustainability Reporting Directive (CSRD), and broader global net-zero commitments—highlights the urgent need for a cross-industry methodology for Active Deforestation Risk Assessment. Ensuring consistent and credible approaches to identify and address deforestation risks is essential to delivering environmental sustainability and achieving compliance, transparency, and accountability across supply chains.

This document provides such a methodology and represents the outcome of a multi-stakeholder process convened by the World Cocoa Foundation (WCF). It consolidates the contributions of a WCF-led task force and reflects the collective expertise of representatives from the cocoa industry, academia, international organizations, compliance service providers, and government authorities from seven producing countries responsible for forest and land-use governance.

This methodology provides step-by-step guidance covering all essential components of active deforestation risk assessment. The protocol includes plot data collection, quality assurance, forest baseline definition, identification of non-negligible risk of deforestation, legal zoning analysis, verification, and the mitigation protocol for plots with verified non-negligible risk of deforestation.

Though this methodology has been developed to provide the cocoa sector with an approach to deliver deforestation risk assessment generally, it is designed to align with the EUDR definition of non-negligible risk, which explicitly encompasses both deforestation and legality considerations. In terms of legality, the EUDR covers a broad range of issues. This methodology addresses only land use-related topics that can be assessed spatially using remote sensing. Accordingly, a plot is considered to present a non-negligible risk when there is evidence of forest conversion after the regulatory cut-off date. Illegal land-use also indicates non-negligible risk, such as a plot's location inside of a protected area boundary. The legal zoning analysis included in this methodology supports the integration of such land-use legality considerations into the deforestation risk assessment, in line with EUDR requirements. Where recommendations for best-practice DRA go above and beyond what is required for the EUDR, these are explicitly stated.

Within this framework, tree cover loss is not treated as a generic starting point. Deforestation is a targeted indicator interpreted only when it occurs within areas classified as forest or uncertain at the cut-off date. When combined with a robust forest baseline, legal zoning checks, and verification procedures as described in this methodology, tree cover loss becomes a relevant and defensible signal for identifying potential deforestation risk.

While a globally uniform approach to deforestation risk assessment is desirable, this methodology intentionally allows for context-specific implementation, providing a foundational standard. The protocol recognizes that data availability, accuracy, and legal frameworks vary across producing countries. This flexibility ensures that the assessment methodology remains globally applicable while maintaining local credibility and still producing risk classifications that remain consistent with the EUDR framework.

2 Intended users and institutional roles

This document supports a range of actors involved in deforestation-free cocoa supply chain monitoring, providing a shared methodological foundation and reference while allowing for flexibility in implementation.

For cocoa trading, processing and manufacturing companies and producing-country governments, the methodology provides practical guidance on best practices for deforestation-free monitoring, whether systems are developed in-house or implemented through third-party providers. This methodological protocol highlights the key elements that should be included in robust monitoring solutions and offers guidance on how deforestation risk information should be interpreted, verified, and acted upon as part of due diligence processes.

For third-party compliance and monitoring service providers, the methodology is designed to guide the adoption of standardized best practices for deforestation risk assessment in the cocoa sector. The protocol also leaves sufficient space for the development and use of proprietary tools, datasets, and analytical approaches. The objective is not to prescribe a single technical solution, but to promote the foundation for methodological consistency, transparency, and comparability across services.

This methodology also recognizes the central role of national forest agencies and other competent public authorities. These institutions are responsible for defining and formalizing national legal frameworks. They provide, maintain, and validate official legal zoning data, including protected areas and other regulated land-use zones. Their datasets and determinations should be considered the authoritative reference for legal zoning and land-use compliance assessments within producing countries.

The protocols presented here do not override or replace local regulations; where national or local legal requirements are more restrictive, those requirements take precedence. Conversely, compliance with local law alone is insufficient to be considered compliant with this methodology. The protocol also requires adherence to the methodological principles, definitions, and procedures set out in this document.

3 Key Definitions and Concepts

3.1 Land cover definitions

This methodology strictly adheres to the following specific definitions when assigning a land cover classification to a given area. While the methodology is designed to be applicable beyond the EUDR, all definitions used are derived from and fully compatible with EUDR definitions.

Agricultural Land: refers to land used primarily for the purpose of agriculture, meaning the production of crops or the rearing of livestock.

For the purposes of this methodology, agricultural land includes, among others[1]:

- Agricultural plantations and agroforestry systems, including perennial and annual crop systems (e.g. fruit tree plantations, oil palm, cocoa, and other tree crops).
- Fallow land, including land temporarily not cultivated as part of crop rotation systems or for legitimate environmental, social, economic, or legal reasons, provided the land remains intended for agricultural use.

Land is classified as agricultural based on its intended and actual land use, rather than solely on vegetation structure or tree cover. Areas used for agricultural purposes remain classified as agricultural unless they are officially designated as forest under national law.

Cocoa Land: an agricultural land defined as any land where cocoa is cultivated, regardless of the growing system, age of the trees, or management practices.

Fallow Land: refers to agricultural land that is temporarily uncultivated for a limited period of time, either as part of a crop rotation system or due to legitimate constraints that prevent agricultural activity. Under this methodology, land under fallow or set-aside is considered to remain in agricultural use for a maximum period of ten (10) years provided this is consistent with applicable national regulations. The land also cannot have been officially designated or reclassified as forest by the competent local authorities during that period. Legitimate reasons for fallow status may include environmental factors (such as floods or drought), economic or social constraints (such as lack of inputs, illness, or succession issues), or legal circumstances (such as land disputes). The fallow period may be extended beyond ten years only if clear evidence is provided demonstrating that farming could not resume due to one or more of the valid reasons listed above. In the absence of such evidence, land that remains unmanaged beyond this period should be reassessed.

Forests: for the purposes of this methodology, forests are defined in line with the definition of the Food and Agriculture Organization of the United Nations (FAO). In the FAO definition, forests are "*land spanning more than 0.5 hectares with trees higher than 5 metres and a canopy cover of more than 10%, or trees able to reach those thresholds*", excluding agricultural plantations "*such as fruit tree plantations, oil palm plantations, olive orchards and agroforestry systems where crops are grown under tree cover*". Areas that have undergone reforestation after the cut-off date, or fallow land that has remained uncultivated for more than ten years and has regenerated to meet the forest definition, should also be considered forest, even if this regeneration occurred after the cut-off date.

Others: any land cover that does not fall under any of the previously defined categories.

3.2 Land cover change definitions

Deforestation: refers to the conversion of forest land to agricultural use, meaning a change in land use from what is classified as forest to what is classified as agriculture under this methodology. The extent of the conversion does not matter. Any conversion to agricultural use after a given cutoff date makes the production from that land non-compliant with the regulation. An area is considered

[1] For additional examples and clarification regarding the interpretation of agricultural land under the regulation refer to the EUDR Guidance Document: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52025XC04524

deforested if the forest has been cleared or transformed for agricultural purposes, regardless of who caused it, the land's legal status, or its administrative boundaries. This includes cases where agricultural systems, such as agroforestry, are established within forest areas, even if tree cover is partially maintained and no trees are visibly cut, as the land use has shifted from forest to agriculture.

A transition from fallow land back to agricultural use is considered deforestation only if the fallow land has regained forest status prior to conversion. In practice, this means that if agricultural land remains uncultivated for ten (10) years or more and meets the definition of forest under this methodology, its subsequent conversion back to agricultural use is classified as deforestation. Conversely, if fallow land has not reached the definition of forest, its return to agricultural use is not considered deforestation.

Tree cover loss: refers to the removal of tree cover, caused by various natural or human factors such as harvesting, fire, disease, storms, or other disturbances. In tree crops and agroforestry systems, it can also result from management practices like replanting or pruning. Therefore, tree cover loss does not necessarily mean deforestation. Most remote sensing systems detect tree cover loss rather than deforestation itself. To assess whether deforestation has occurred, these detections must be analyzed in context, by overlaying them with forest baseline maps that show where forests stand. This combined analysis allows the identification of areas with a non-negligible risk of deforestation.

3.3 Plot level data definitions

Plot of land: often referred to as a plot, refers to an area within a single real estate property as recognized under the law of the producing country. It represents a single, continuous production area where cocoa is cultivated, enabling a meaningful assessment of the overall risk of deforestation or forest degradation linked to the commodity produced there. While land cover, vegetation structure, or management practices within the plot may vary (for example due to agroforestry or intercropping), the plot should represent a contiguous production area under the management of the same producer or farm unit. The plot should represent a continuous production area dedicated to the commodity being assessed, without combining distinct and separate production systems. For example, if a farmer cultivates cocoa adjacent to a maize field, the plot submitted for due diligence should include only the cocoa production area and exclude the maize field. Agroforestry systems and intercropping practices are considered continuous production systems within a single plot, as they form part of the same integrated agricultural area and are managed as a coherent unit. A farm may consist of one or several plots of land, depending on its structure and ownership. Plots of land are strictly limited to the production area and do not include non-productive infrastructure such as households, storage facilities, or other buildings.

Polygon: a geo-referenced, digital representation of the perimeter of a plot of land where the commodity has been produced. Each polygon must correspond to one single plot of land. When a product originates from multiple plots of land, separate polygons must be provided for each plot within the same due diligence statement. A polygon cannot represent arbitrary areas that only partially include production plots. For plots larger than four hectares, geolocation data must be provided using polygons, with latitude and longitude coordinates recorded to six decimal places to accurately define the plot boundaries.

Point: a single pair of coordinates, expressed in latitude and longitude using decimal degrees with at least 6 decimal places (sub-meter tracking position). Points define a specific location within a plot. Point data may be used to represent plots of land smaller than four hectares. In such cases, operators and traders that are not SMEs may provide a single latitude and longitude coordinate located as close as possible to the center of the plot, so as to best represent its spatial position.

3.4 Risk assessment definitions

Buffer analysis: a spatial method used to approximate the area of a plot of land when only a single global positioning system (GPS) point is available, typically for plots smaller than four hectares. Since a single point does not indicate the actual boundaries, a circular buffer is created around it to simulate the likely extent of the plot. The buffer size usually ranges from one to two times the reported plot area. Although not required by the EUDR, buffer analysis can provide additional context and supporting evidence when assessing the non-negligible risk of deforestation. However, it has important limitations, as it represents only an estimated area and may introduce uncertainties or unrealistic boundaries compared to the true plot extent.

Negligible risk: a level of risk at which—based on the available information, assessment, and verification procedures, and considering the applicable cut-off date and the relevant legislation of the of producer's country—there is no cause for concern that a product may be linked to deforestation.

Non-negligible risk: a situation in which negligible risk cannot be demonstrated based on the available information, assessment, or verification procedures.

4 Methodology Overview

This document structures the Active Deforestation Risk Assessment Methodology around seven main components and their corresponding sections.

The Plot Data section ensures the collection of accurate, complete, and verifiable geolocation data for all plots of land. The Forest Baseline section focuses on compiling and validating the best available datasets to define the state of forest cover at the cut-off date. The Deforestation section describes how to overlay forest baselines, remote-sensing change detection layers, and plot boundaries to identify areas with a non-negligible risk of deforestation. The Legal Zoning section establishes procedures to cross-check official legal zoning data (such as protected area boundaries) with plot data to detect potential land-use–related legal risks. The Verification section provides guidance on visual and field verification of flagged plots, ensuring that results are documented and fed back into system improvements. Finally, the Mitigation section outlines preventive actions and post-risk response protocols for addressing plots confirmed to present a non-negligible risk of deforestation.

The methodology follows a stepwise process composed of seven main components:

1. **Plot Data Collection and Quality Assurance**: Collection and validation of geolocation data (points and polygons) to ensure spatial accuracy, consistency, and traceability.
2. **Forest Baseline Definition and Validation**: Establishment of a forest reference layer aligned with the applicable cut-off date, using one or multiple datasets and, where possible, a convergence of evidence approach.
3. **Plot Data Preparation for Risk Assessment**: Preparation of plot geometries and optional buffer analysis to support risk interpretation, particularly for point-based plots.
4. **Deforestation Overlay Analysis**: Combination of forest baseline layers, tree cover loss detections, and plot data to identify plots presenting a non-negligible risk of deforestation.
5. **Legal Zoning Analysis**: Assessment of potential overlaps with protected areas and other legally restricted zones to identify potential land-use legality risks.
6. **Verification**: Verification of flagged cases through high-resolution imagery, ancillary datasets, and/or field visits to reduce false positives and avoid unjust exclusion of producers.
7. **Mitigation and Corrective Actions**: Implementation of proportionate responses and corrective measures for plots verified as presenting non-negligible deforestation risk.

Requirements vs. recommendations

The methodology distinguishes between three levels of recommendations throughout the document:

- **Core methodological requirements:** Minimum elements required to ensure methodological consistency and alignment with the framework.
- **Recommended best practices:** Strongly encouraged approaches that improve robustness, transparency, and accuracy but may not always be feasible in all operational contexts.
- **Optional or context-specific enhancements:** Additional measures that may further strengthen implementation where data, resources, or institutional conditions allow.

Across the document, workflows shown inside dashed boxes, or workflow steps displayed with dashed outlines, should be interpreted as recommended best practices rather than core methodological components of the workflow.

Two overarching principles guide the methodology. First, while reducing the risk of sourcing cocoa associated with non-negligible deforestation is essential for regulatory compliance and sustainable sourcing, it is equally important to avoid the unjust exclusion of producers based on uncertain, incomplete, or unverified information.

Second, the methodology recognizes that no single dataset or mapping system can perfectly distinguish forests from agricultural land in all contexts, particularly in complex tropical landscapes and agroforestry systems.

Building on these overarching principles, the methodology promotes a series of recommended best practices intended to strengthen the robustness, transparency, consistency, and fairness of deforestation risk assessment systems. Consistent with EUDR requirements, this methodology also strongly recommends segregating cocoa identified as deforestation-free from cocoa associated with non-negligible deforestation risk to strengthen traceability and supply chain integrity. As a best practice, the assessment of deforestation risk and legal zoning should be conducted prior to the purchase of products, allowing potential risks to be identified and addressed before sourcing decisions are made. Early assessment reduces the likelihood of downstream remediation and supports more proactive risk management. Additional best practices include: the use of transparent assessment and verification procedures to support reliable decision-making; the combination of multiple sources of information and contextual interpretation of remote sensing results to improve the credibility of assessments; and the continuous refinement of monitoring systems over time through feedback loops and iterative improvement. The methodology also encourages the use of forest baseline information to: i) contextualize tree cover loss detections; ii) prioritize higher-quality geolocation data such as polygons, where feasible; iii) implement verification procedures before exclusion decisions are made; and iv) adopt proportionate mitigation and corrective actions aligned with the principles of the Accountability Framework Initiative (AFi).

5 Plot Data Collection and Quality Assurance

In compliance with the EUDR, all geolocation data must be accurate, standardized, and traceable.

5.1 Data Structure

5.1.1 Geolocation format

Core Methodological Requirement: Data must be provided in WGS84 projection (EPSG:4326) using decimal degrees (no degree symbols or N/S/E/W) with at least 6 decimal places.

5.1.2 Geolocation Data Quality Requirements

Core methodological requirements: Because positional accuracy varies depending on device quality and environmental conditions (e.g., canopy cover, terrain, satellite availability), data collectors should allow sufficient time for the device to stabilize before recording coordinates. Positional quality should be evaluated and recorded using the Estimated Positional Error (EPE) or horizontal accuracy metric displayed by the device.

Recommended best practices: As a best practice, coordinates should be recorded only when the EPE is 5 meters or less, which is consistent with the tolerance used elsewhere in this methodology for minor spatial discrepancies between plots. If this threshold cannot be achieved due to field conditions, the point may still be recorded but should be flagged as lower-confidence geolocation data and prioritized for improvement where relevant.

Optional/context-specific enhancements: When feasible, data collection can be further optimized by planning fieldwork at times when satellite geometry is favorable using Global Navigation Satellite System (GNSS) mission-planning tools. In challenging environments such as dense canopy or steep terrain, positional accuracy may also be improved by using external GNSS receivers connected to smartphones or tablets and by holding the receiver in a position with the clearest possible view of the sky.

5.1.3 Data format

Core Methodological Requirement: All coordinates should be stored in a consistent GIS data management structure, such as GeoPackage, Shapefile, GeoJSON, or spatial database systems such as PostgreSQL/PostGIS. The selected format should support consistent geometry management and attribute storage. **Note:** Within the scope of the EUDR, all coordinates must be submitted in a consolidated GeoJSON file, subject to the maximum file size limits defined by the regulation (currently 25 MB per file).

5.1.4 Data Update Frequency

Recommended best practices: To ensure data remains accurate and fit for purpose, the following update frequencies are recommended. These recommendations should be adapted to operational realities, with priority given, where feasible, to plots and supply chains presenting higher deforestation or data quality risks.

- New plots added to a supply chain should be incorporated into the geolocation database at least annually, meaning no more than one year should elapse between updates.
- Plot boundaries (points or polygons) identified as high risk, particularly those linked to potential deforestation risk as described in the Mitigation Protocol, should be updated at least annually.
- Plot boundaries in low-risk areas should be reviewed and updated at least every five years to account for gradual changes in land use or farm expansion.

5.1.5 Plot Geolocation Data Types

Core methodological requirements: Polygons are required for plots larger than 4 ha and should represent the exact perimeter of each production plot using coordinates recorded to at least six decimal places. Points may be used for plots under 4 ha to satisfy EUDR geolocation requirements. When point data are used, the point should be collected as close as possible to the true center of the production plot.

Recommended best practices: Polygons provide greater spatial context and reduce the risk of both overlooking deforestation within a plot and misattributing deforestation to the wrong plot. For this reason, polygons are recommended as the preferred data type for geolocation collection whenever feasible. If resources are limited and high-quality polygon collection cannot be ensured, a well-positioned point collected at the true center of the plot can be more reliable than a poorly captured polygon. In such contexts, point data may represent an acceptable alternative, provided that the plot area is under 4 ha and the reported plot area is included whenever possible. High-quality polygon data are particularly recommended in higher-risk areas, such as regions near forests or where deforestation pressure is elevated, as they provide greater spatial precision for downstream risk analysis.

Figure 1 below illustrates the workflow from raw ground data collection to the development of a curated, validated geolocation database, outlining each step required to ensure data quality, consistency, and readiness for deforestation risk assessment.

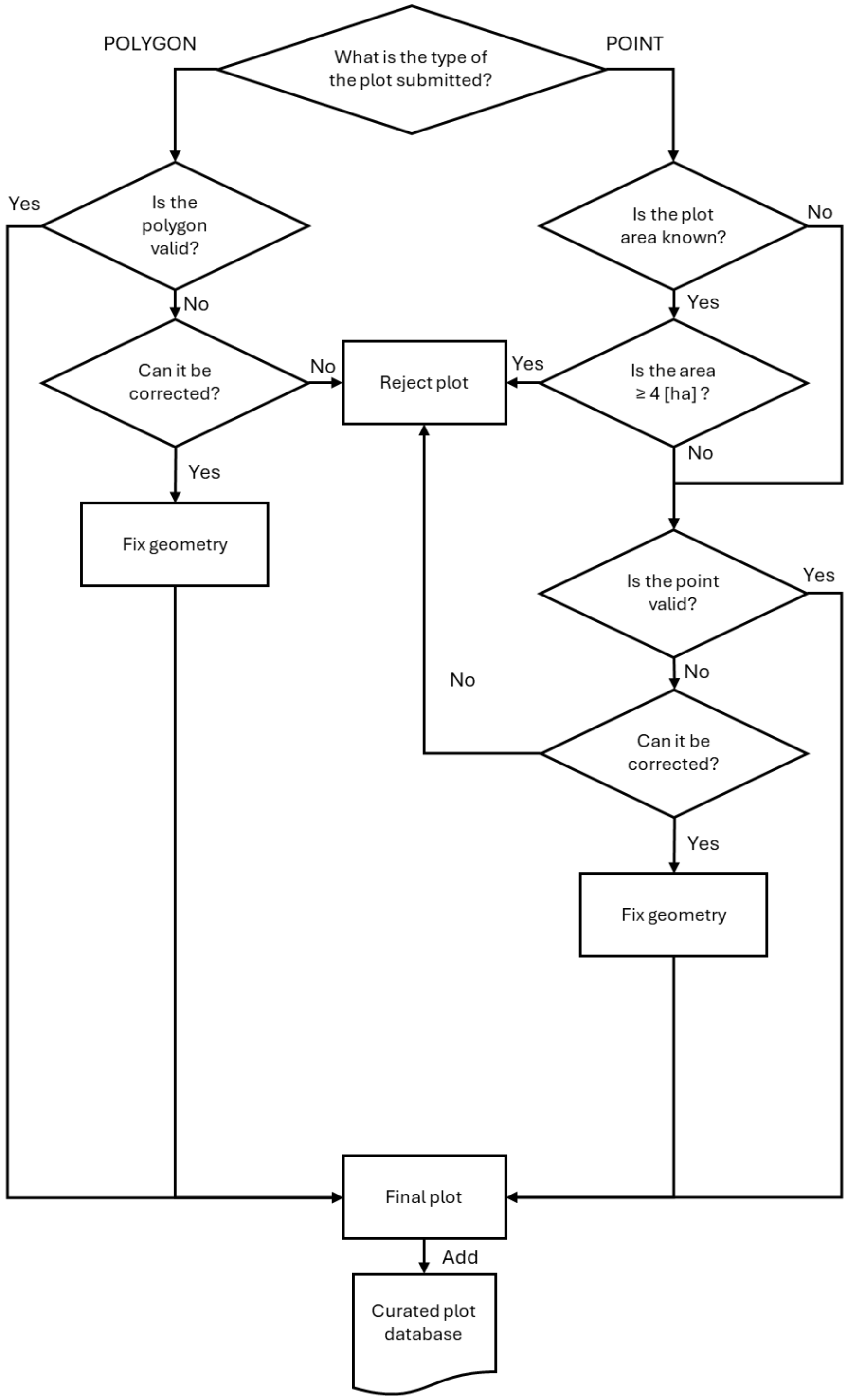

Figure 1. Workflow from raw to curated plot database

5.2 Minimum quality requirements

While the EUDR only requires polygons to have a valid geometry, defined as having at least four points and no self-intersections, additional quality checks are strongly recommended to ensure data accuracy and usability. These checks help identify inconsistencies, misplaced plots, and unrealistic geometries before proceeding with deforestation risk analysis.

Recommended quality checks include:

5.2.1 Point Quality Requirements

Core methodological requirements: When plot geolocation is provided as a single point, the point should be collected within the production plot and as close as possible to its center, so that it best represents the spatial location of the plot (Figure 2). Points should not be collected on houses, roads, or other non-productive features.

Figure 2. Examples of good (green) and problematic (red) point placement for the same plots. Images a1–a3 show appropriate point placement within the target plots. Corresponding images b1–b3 show problematic placement for the same plots, including a point located on a household structure (b1), on a road outside the plot (b2), and near the plot edge (b3).

5.2.2 Administrative consistency

Core methodological requirements: Verify that all polygons or points fall within the correct administrative boundaries (e.g., country, region, district) as indicated in the accompanying metadata.

5.2.3 Contextual overlay checks

Recommended best practices: Where reference datasets are available, polygons and points should also be overlaid with water body and urban area maps to flag plots that fall partially or fully within clearly non-agricultural land uses (Figure 3). Such cases should be reviewed, as they may indicate misplaced geometries or administrative inconsistencies in the underlying plot data.

Figure 3. Examples of plots partially overlapping with non-productive areas. a) a plot polygon overlapping with a water body, image b) a plot overlapping with an urban area.

5.2.4 Geometry consistency

Recommended best practices: In addition to verifying that polygon geometries are technically valid, efforts should assess whether polygon shapes, sizes, and spatial configurations are realistic and consistent with expected agricultural plot patterns. The following checks can help identify potential data collection, digitization, or geometry processing errors:

- Ensure that polygon areas fall within realistic limits; unusually large or small polygons should be reviewed (Figure 4).
- Polygons with sharp angles, spikes, or irregular geometries may indicate errors in the data collection or digitization process (Figure 5). Common causes include missing vertices, extra points inadvertently recorded during field mapping (for example when collecting other on-farm features and accidentally including them in the boundary), or incorrect ordering of vertices, which can produce self-crossing polygons. Such geometries should be flagged for review and corrected where necessary.
- Identify and review polygons linking separate plots via thin connecting strips, which are sometimes recorded as a single feature.
- Outlier vertices and connecting strips can be detected using polygon shape metrics such as roundness (or compactness) scores and area-to-bounding-box ratios. These metrics are available in the vector geometry or analysis toolboxes of common GIS software such as QGIS and ArcGIS. Polygons with very low roundness scores (e.g., <0.1) or very small area-

to-bounding-box ratios (e.g., <0.2) may indicate elongated geometries or artificial connections between separate plots. These thresholds should be interpreted as screening indicators and may be adjusted based on the distribution of polygon shapes within the dataset or country context.

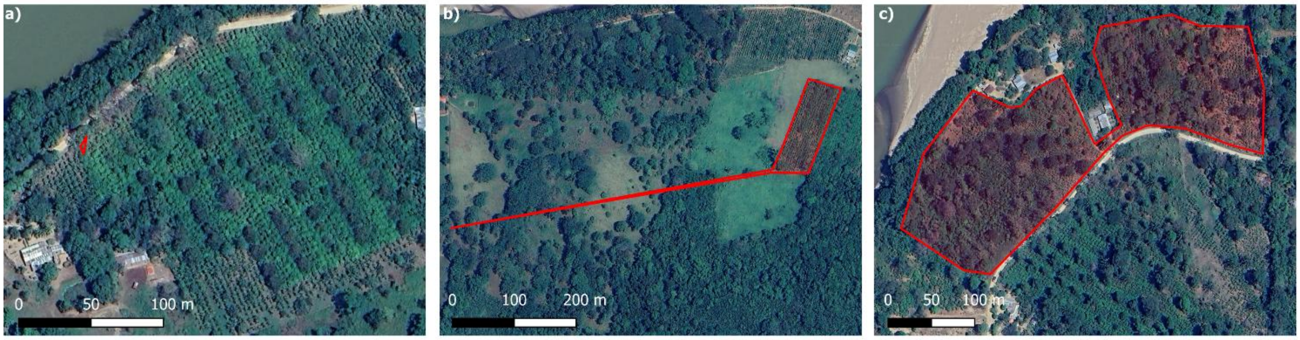

Figure 4. Examples of unrealistic or problematic polygon geometry. a) an unrealistically small polygon, b) a polygon with sharp angles and spike-like extensions, c) separate plots incorrectly linked by thin connecting strips.

Figure 5. Examples of invalid polygon geometries. a) Self-intersecting polygon; b) Polygon with crossing boundaries; c) Polygon with an unclosed or improperly connected boundary segment.

5.2.5 Polygon Overlap within the Database

Recommended best practices: While overlapping polygons should generally be avoided, a certain level of overlap is often unavoidable due to the inherent positional inaccuracies of GPS devices and data collection methods (Figure 6). While minor overlaps may be tolerated depending on the chosen data management approach, the long-term objective should be to maintain an integrated plot database in which polygon overlaps are progressively identified and eliminated. Achieving a non-overlapping plot database improves spatial accuracy, prevents double counting of production areas, and strengthens the reliability of deforestation risk assessments over time. To maintain database integrity and minimize duplication, the following procedures are recommended:

- **Minor overlaps (<10% of total area):** Minor overlaps are overlaps that are attributable to normal GPS positional uncertainty.

- Distance-based rule (<3 meters): Any overlap with a maximum width of 3 meters or less (e.g., narrow slivers along shared boundaries) is classified as a minor overlap, regardless of the percentage of polygon area it represents.
  - **Area-based rule (<10% of total area):** Overlaps with a width greater than 3 meters may still be classified as minor only if the overlap represents less than 10% of the area of at least one of the two overlapping polygons.

  Automatic handling: Minor overlaps can be handled in two different ways. One option is to retain the polygons as originally collected and allow minor overlaps to remain in the dataset. This approach avoids modifying plot geometries but requires careful handling during subsequent analyses to prevent double counting of areas or misattribution when identifying plots with non-negligible risk of deforestation. Alternatively, minor overlaps can be resolved automatically by removing the overlapping area from the polygon for which the overlap represents the smaller percentage of its area (i.e., typically the larger polygon). This approach prevents double counting while minimizing distortion of the smaller plot boundary. As a safeguard, automatic geometry corrections should not result in a change in the plot's classification (point vs. polygon) if the adjustment causes the polygon area to cross the 4-hectare threshold. Both approaches are considered acceptable under this methodology, provided that the chosen method is applied consistently within the dataset.

- **Major overlaps (>10% of total area):** These cases should be reviewed visually. High-resolution imagery or other reliable spatial references can help determine which polygon accurately represents the true plot boundary. The incorrect or less precise polygon should then be adjusted or removed. Polygons with substantial overlap are likely duplicates and should be flagged and removed from the database, retaining only the most accurate or complete version. To determine which polygon to retain, high-resolution imagery may be used as an initial reference to assess whether the mapped boundaries appear consistent with visible landscape features. However, in many contexts, particularly in West African cocoa landscapes, plot boundaries are often not clearly identifiable from desktop analysis alone. In such cases, field verification should be prioritized to confirm the correct boundaries and update the geometry based on direct observation and farmer consultation.

Figure 6. Examples of polygon overlap classification. a) Minor overlap (<3 m width); b) Minor overlap (>3 m width but <10% overlap area); c) Major overlap (>3 m width and >10% overlap area).

5.2.6 Data Quality in Protected Areas

Recommended best practices: As a non-mandatory best practice, when plots are located within or adjacent to legally protected or classified forest areas, the use of polygon-based geolocation is strongly recommended, regardless of the declared surface area. In such contexts, a single GPS point is generally insufficient to reliably assess potential illegal occupation or encroachment into protected forest land. Where production occurs in or near protected areas or other restricted forest classifications, plots should be represented by accurate polygons that precisely delimit the cultivated area. This allows for a more reliable assessment of compliance with national legal zoning requirements, including official boundaries of protected areas. As part of this best practice, any overlap between production plot polygons and areas with protected forest status should be treated as a high-risk signal requiring verification.

5.2.7 Production Capacity Consistency Check

Recommended best practices: As part of data quality assurance, an optional production capacity consistency check can be applied to assess whether reported sourcing volumes are plausible given the mapped production area. This check compares the total volume sourced from a single plot or set of plots (points or polygons) with the expected production capacity based on their combined area. Indicative upper and lower bounds of yield per hectare, informed by country, or region-specific agronomic knowledge, can be used to flag cases where reported volumes appear unrealistically high or low. Such discrepancies may indicate potential issues in plot mapping, volume reporting or mixing of cocoa from outside of the plot declared as the source.

5.2.8 Overlap Management Across Supply Chains

Recommended best practices: In the absence of a single authoritative geolocation source, overlaps between plot polygons are inevitable, particularly in smallholder contexts where boundaries are unclear and GPS accuracy is variable. Where polygons originate from the same provider or within the same supply-chain structure (e.g. within a cooperative), overlaps should be harmonized following the threshold presented above.

For polygons originating from different providers or supply chains, duplication and large overlaps should be avoided, while smaller overlaps may be addressed through a phased and risk-based approach, recognizing current operational constraints.

Optional/context-specific enhancements: Looking forward, the development of high-quality, integrated national traceability systems in producing countries represents a key long-term solution to reduce duplication, improve consistency, and streamline plot mapping across the sector.

5.2.9 Visual inspection

Recommended best practices: Visual inspection using high-resolution imagery is recommended for polygons and points that have been flagged by automated geospatial quality checks as presenting potential inconsistencies.

Typical triggers for visual inspection include polygons that:

- exhibit unusual size, shape, or geometry metrics; or

- cannot be confidently validated through automated spatial checks alone.

When performed, visual inspection using high-resolution imagery can help confirm whether a polygon corresponds to a visible production area or whether it represents a data quality or administrative error.

5.2.10 Recommended Metadata

Recommended best practices: To support data quality, traceability, and interpretation of plot geolocation data, plot geometries (polygons or points) should be accompanied by a basic set of metadata attributes, where available.

Recommended metadata may include, for example:

- year of establishment of the plantation
- date of mapping or data collection
- plot area (in particular for point data)
- crop management
- locality or administrative unit
- data provider or source
- a unique plot identifier
- a unique farmer identifier (e.g. national farmer ID, where applicable)

The availability and completeness of metadata may vary across contexts; however, even partial metadata can substantially improve confidence in the interpretation and use of geolocation data.

6 Baseline Definition and Validation

6.1 Baseline Definition

Core methodological requirements

The forest baseline serves as the reference layer against which potential deforestation is assessed. A forest baseline aligned with the selected regulatory or methodological cut-off date must be used as the reference layer for assessing potential deforestation. The baseline may be derived from a forest map, land-cover map, or equivalent dataset, provided that it identifies forest areas in accordance with the forest definition adopted in this methodology.

Regardless of the source or methodology used, the selected baseline must be transparent, documented, and appropriate for the local context, and its limitations should be clearly understood and communicated.

Recommended best practices

The forest baseline may be developed using a convergence of evidence approach, which combines multiple forest and tree crop datasets evaluated for quality, accuracy, and consistency. When applied, this approach helps reduce the limitations of any single source, as inconsistencies can be identified and addressed through comparison and harmonization of multiple datasets. The convergence of evidence approach is strongly recommended as a best practice, particularly in contexts where multiple reliable datasets are available or where discrimination of forests and cocoa lands is challenging. However, its use is not mandatory. In cases where a single forest or land-cover dataset is used, such as when relying on an integrated service provider that supplies both baseline and deforestation detection, the subsequent deforestation risk analysis should follow the same principles, steps, and decision logic described in this methodology.

While not mandatory, it is strongly recommended that all datasets included in the baseline are supported by an accuracy assessment conducted following recognized best practices, such as those described by Olofsson et al., (2014) for land cover map accuracy assessment. Where a credible and documented accuracy assessment already exists, this assessment may be referenced and does not need to be repeated.

To be considered reliable, an accuracy assessment should, at a minimum:

- be based on an independent validation dataset, not used in the map creation process, that was sampled from the map itself and designed with adequate spatial distribution and representative coverage of all relevant land-cover classes.
- report key accuracy metrics, including precision and recall (or user's and producer's accuracy), with an associated confidence interval or margin of error for each class.

When accuracy assessments are conducted, a stratified random sampling framework is recommended to ensure balanced representation of forest, non-forest, and relevant tree crop classes (Olofsson et al., 2013). Results should be transparently documented and, where feasible, accompanied by error estimates or confidence bounds.

At present, there is no widely accepted, peer-reviewed standard establishing minimum thresholds for overall accuracy, omission, or commission errors in this context. However, based on the evaluation work conducted on datasets in Ghana and Côte d'Ivoire (Reymondin et al., 2025), the following indicative classification framework is recommended to support dataset comparison and prioritization:

- ≥ 0.9: Excellent
- ≥ 0.8: Good
- ≥ 0.7: Limited
- < 0.7: Very limited

These thresholds are intended as indicative guidance only and should be interpreted considering the specific country context, dataset purpose, and intended use within the risk assessment workflow.

Independent third-party validation is strongly recommended, particularly for baseline layers used in high-risk contexts or as primary decision layers. However, third-party validation is not mandatory, provided that the accuracy assessment is methodologically sound, transparent, and independently verifiable.

6.2 Baseline Creation based on convergence of evidence

Recommended best practices

This section describes a recommended approach for developing an integrated forest baseline using a convergence of evidence methodology. This process should be guided by the measured accuracy of each dataset. Datasets with higher validated accuracy should be prioritized and given greater weight in the integration process. Official or nationally produced datasets, that demonstrate high accuracy can provide valuable local contextualization and should be prioritized within the convergence framework. However, we recommend avoiding single sources of information, as demonstrated in the WCF comparative assessment of datasets in Ghana and Côte d'Ivoire, where combining multiple sources produced more reliable and balanced results (Reymondin et al., 2025).

To support implementation, the following resources are available:

- A comprehensive catalogue of publicly available datasets suitable for forest and commodity baseline development is provided in Annexes 3 and 4.
- Benchmark analyses comparing the accuracy, strengths, and limitations of forest and commodity baseline datasets are available for Côte d'Ivoire and Ghana (Reymondin et al., 2025) and Colombia and Ecuador (Reymondin et al., 2026).
- Guidance on selecting and integrating datasets using a context-specific convergence of evidence approach is provided in Reymondin et al. (2025).
- Up-to-date benchmark results, dataset comparisons, and additional guidance on dataset selection are available through Sample Earth (2026).

Figure 7 provides an overview of the workflow, which is described in detail in the following sections.

6.2.1 Quality Assessment and Prioritization of Forest Layers

The process begins with a comprehensive quality assessment of all available forest datasets. Each dataset is reviewed for spatial resolution, temporal relevance, accuracy, and methodological transparency. Based on these criteria, datasets are prioritized to ensure that the most reliable and context-appropriate layers form the foundation of the baseline.

6.2.2 Quality Assessment and Prioritization of Tree Crop Layers

In parallel, all available tree crop datasets, including cocoa and other relevant perennial crops, undergo a similar quality review and prioritization. This step ensures that the datasets used to represent cultivated areas are consistent, aligned with the cutoff date, and spatially aligned with the forest data.

6.2.3 Compilation and Identification of Convergences and Divergences

Following quality assessment, datasets are compiled and compared to identify areas of convergence and divergence among sources. Convergence occurs where multiple datasets agree on land cover classification (e.g., forest or non-forest), while divergence highlights zones of uncertainty or potential misclassification. This comparison provides a first level of validation for both forest and tree crop datasets.

6.2.4 Integration of Forest and Tree Crop Baselines

The exact combination of datasets used in this step is country-specific, depending on the availability and quality of spatial data in each context. The integration should follow a decision tree or similar structured approach, in which datasets are weighted and combined based on their validated accuracy for representing forest and tree crop areas. Regardless of the specific datasets used, the goal is to produce at least three land-cover classes: forest, non-forest, and uncertain.

The uncertain class represents areas where the convergence toward forest and tree crops (e.g., cocoa) is not clear, for example, where both categories show a low degree of agreement across datasets.

The two intermediate baselines are cross-compared to identify combined convergence patterns.

- *High convergence toward forest / low convergence toward tree crops* areas are classified as forest.
- *Low convergence toward forest / high convergence toward tree crops* areas are classified as non-forest.
- *High convergence toward forest / high convergence toward tree crops* areas are marked as uncertain, pending further verification.
- *Low convergence toward forest / low convergence toward tree crops* areas are classified as non-forest.

While areas classified as uncertain represent disagreement between datasets, they are treated as forest in subsequent analyses. This conservative approach reduces the risk of overlooking non-negligible risk of deforestation, ensuring that potentially forested areas are not prematurely excluded from risk consideration.

6.2.5 Integration of Ancillary Data, Verified Compliant Plots, and Fallow Lands

To further refine the forest baseline, additional information sources are integrated to distinguish between true forest areas and tree-dense agricultural systems such as agroforestry or fallow lands. These ancillary datasets help reduce misclassification and improve the precision of the final classification.

a) Ancillary Data Quality Requirements

Ancillary datasets used to support, refine, or correct the forest baseline, such as data on agroforestry systems, fallow lands, or verified compliant plots, should meet basic quality and reliability criteria to ensure that baseline adjustments are credible and defensible. While ancillary data do not need to be formally certified in all cases, sources should be transparent, well-documented, and appropriate for the local context.

As a general principle, the use of trusted data sources is recommended. Trusted data may include datasets that:

- have been independently validated or audited, in full or through representative sampling.
- clearly document their data collection methods, spatial accuracy, and update frequency.

- adhere to recognized data quality standards, such as those recommended in this methodology for assessing spatial data quality.

In some cases, questions regarding data reliability arise. Confidence in the data can be strengthened through spot-check validation. For example, a sample of plots can be checked against high-resolution imagery using the same visual interpretation approaches described in this methodology. Validating a sample of plots allows users to assess consistency, positional accuracy, and plausibility without requiring full revalidation of the dataset.

b) Treatment of verified agroforestry plots

Ancillary datasets are compared directly with the forest and tree crop baselines. These may be derived from the manual digitalization of high-resolution imagery or from field-verified compliant plots. For example, they could be supported by geo-referenced photographs and on-site observations demonstrating the presence of well-established mature cocoa trees within an area recently flagged as deforestation.

Manual digitalization refers to the process of visually interpreting high-resolution satellite or aerial imagery and drawing (digitizing) polygons that represent visible agroforestry or agricultural plots. This method allows experts to identify canopy patterns and planting structures that distinguish agroforestry from natural forest. Current automatized AI-based systems may struggle to identify agroforestry land uses.

Plots may be verified as agroforestry systems established on land that was already classified as agricultural prior to the cut-off date and clearly shown not to contain forest at that time. Areas within those plots that were classified as forest in the baseline may be reclassified as non-forest.

In some countries, agroforestry systems established within areas that remain legally classified as forests may still be considered part of the forest estate under national law, even if agricultural activity is on-going under the canopy. In this case, the presence of agroforestry alone, whether identified through manual digitization or field observation, is not sufficient to demonstrate that the land should be classified as agricultural under national laws.

In such cases, manually digitized agroforestry polygons, even if they indicate establishment prior to the cut-off date, cannot on their own justify reclassification to non-forest. Additional evidence is required to demonstrate that the land was already designated and used as agricultural land prior to the cut-off date. This evidence may include, for example:

- cadastral or land-use records indicating longstanding agricultural designation.
- certification or audit documentation confirming legally recognized agricultural activity before the cut-off date.
- other official or verifiable records demonstrating that the area was not forest land at the cut-off date.

c) Treatment of Verified Compliant Plots

Plots that have been verified through high-resolution imagery, field visits, or ancillary documentation as being deforestation-free before the cut-off date are used to refine and correct the baseline. If verification demonstrates that these plots are agricultural or agroforestry areas and do not contain natural forest at the cut-off date, the corresponding areas can be removed from the forest baseline and reclassified accordingly. A full description of the verification methods and recommended protocols is provided in the Verification section of this document.

d) Treatment of Fallow Lands

Fallow lands, as defined in this methodology (see definition in section 3.1), refer to temporarily uncultivated agricultural areas kept at rest as part of the crop rotation cycle or for legitimate environmental, social, or legal reasons. Any area within a given plot identified as forest in the baseline should be reclassified as non-forest if: i) the plot has been demonstrated to meet this fallow definition, ii) the plot remains within the maximum fallow 10-year period defined in this methodology, and iii) the plot is verified as not containing forest. This prevents temporary agricultural rest periods from being mistaken for forest regeneration or, when production activities resume, from being misinterpreted as non-negligible risk of deforestation.

Conversely, if land remains uncultivated beyond the defined fallow period and has subsequently met the definition of forest, it should be treated as forest land. In such cases, any later conversion of that land back to agricultural use would be assessed as deforestation.

6.2.6 Creation of the Integrated Forest Baseline

The integrated forest baseline is the final output of the entire workflow illustrated in Figure 7. This integrated baseline results from the combination of all stages, from data quality assessment and comparison to integration of ancillary information and verified plots, bringing together all sources of evidence into a spatially consistent dataset. The integrated baseline serves as the reference layer for identifying post–cut-off-date tree cover loss and assessing non-negligible risk of deforestation across production plots.

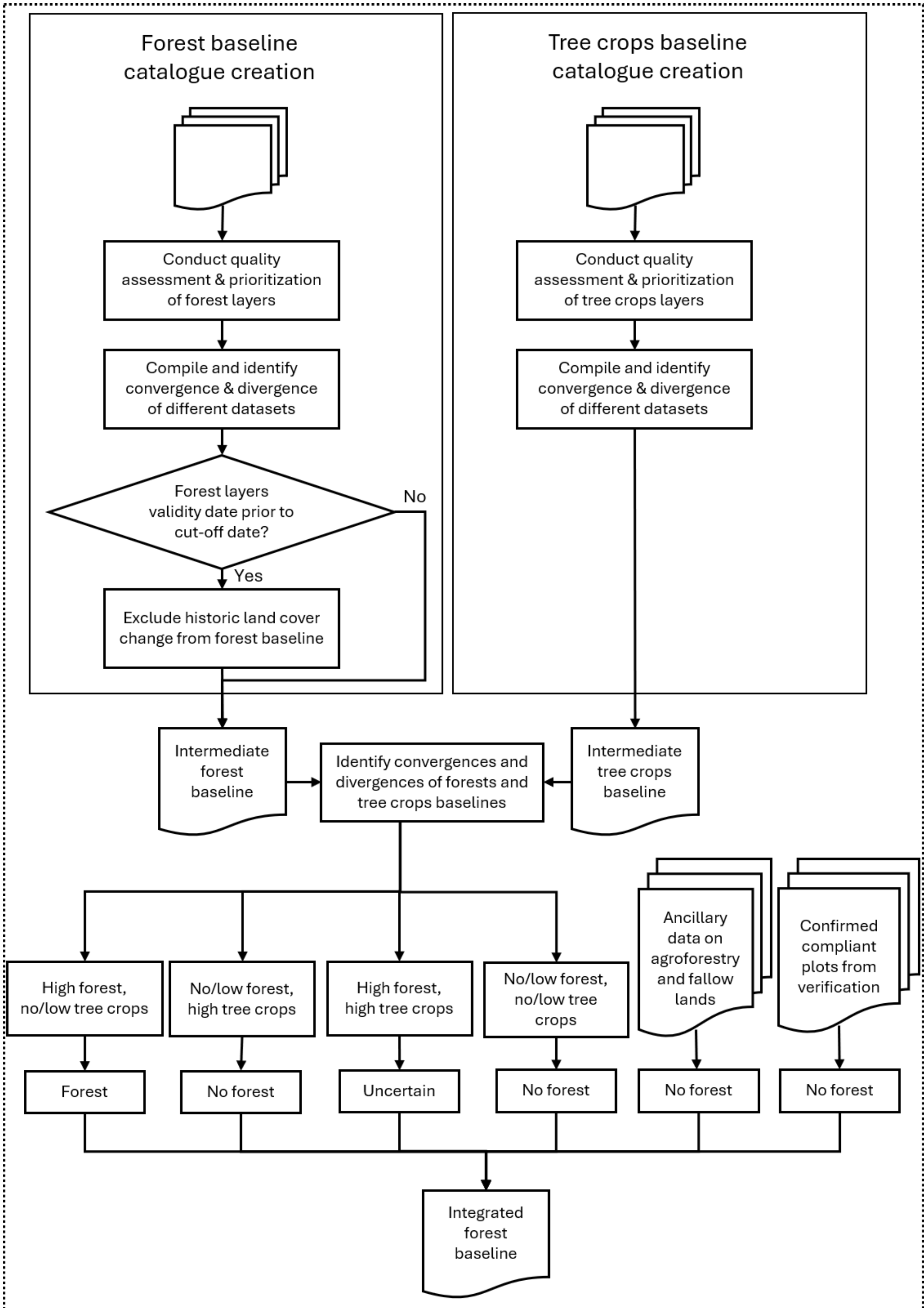

Figure 7. Workflow for creating an integrated forest baseline using a convergence of evidence approach.

7 Plot Data Preparation for Risk Assessment

Recommended best practices

The buffer methodology presented in this section, including all its sub-components, should be interpreted as a set of recommended best practices intended to support consistent identification of deforestation risks.

Though not required by EUDR, buffer analysis can provide additional spatial context when only a single point is available, helping to better assess the risk of deforestation. However, it remains an estimation and should be interpreted with caution due to possible boundary inaccuracies as the buffers used are circle shaped, and real plots are generally irregularly shaped.

To ensure consistent and fair risk assessment across different plot types, the methodology applies a harmonized buffer creation protocol that distinguishes between polygon-based plots and point-based plots, while ensuring that true plot geometries always take precedence over any buffer approximations. The full workflow for buffer creation is presented in Figure 8 below.

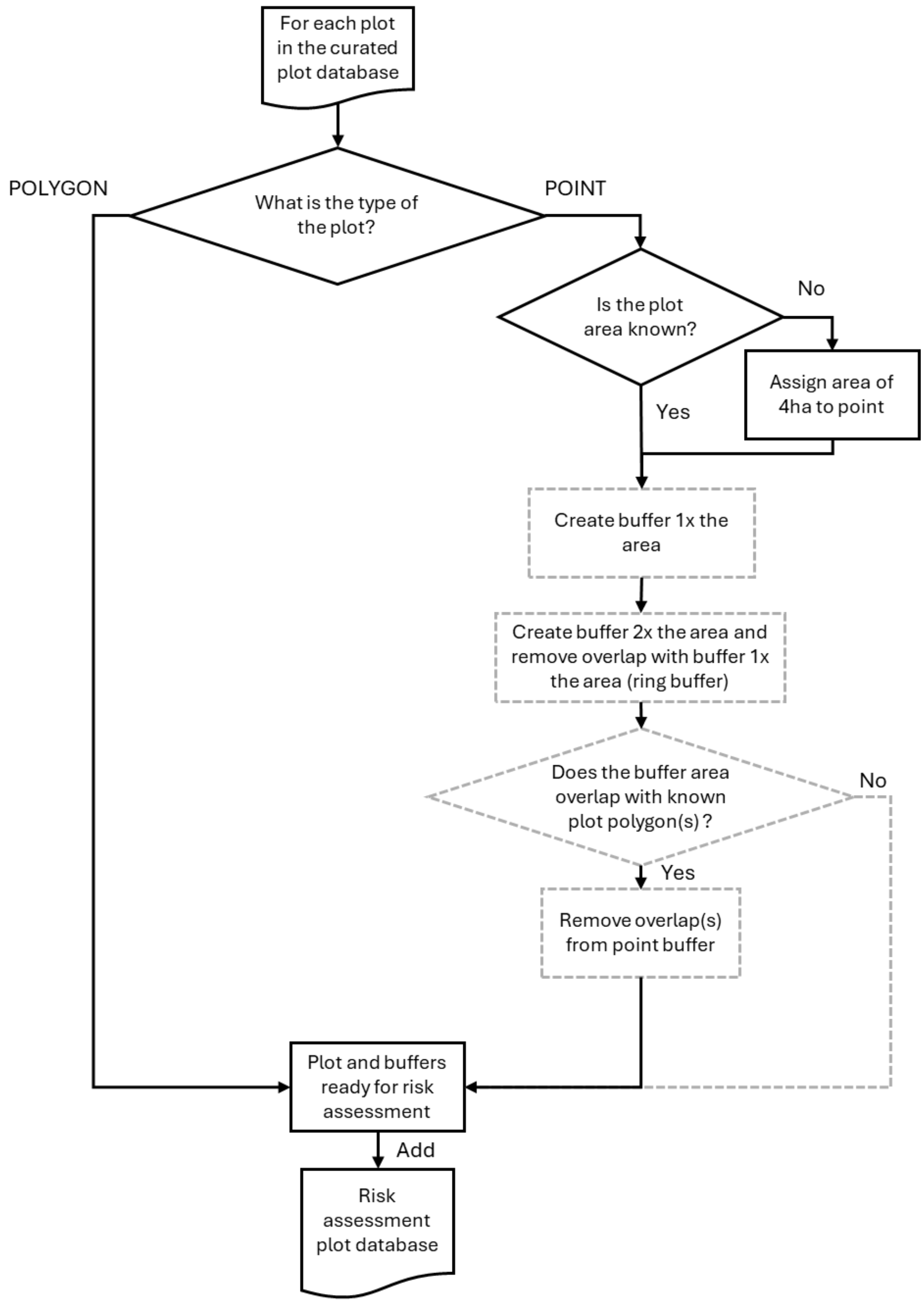

Figure 8. Plot data preparation for risk assessment. Steps shown with dashed outlines represent recommended best practices and are not core methodological requirements.

7.1 Buffers for Point Plots

To better characterize uncertainty driven by the lack of knowledge about the actual plot shape represented by point data and to reduce the risk of both false positives and false negatives, a three-tier buffer analysis is performed (Figure 9):

1. **0× buffer:** No buffer applied; analysis is performed solely on the point location.
2. **1× plot-area buffer:** Circular buffer equal to the reported plot area (or the default 4 ha if area is unknown).
3. **Ring buffer (1×–2× plot area):** A second buffer representing 2× the plot area is created and the inner 1× buffer is removed, producing a *ring* buffer used to assess risks beyond the immediate plot footprint. The additional ring buffer better accounts for the full spatial extent that an irregularly shaped plot could cover.

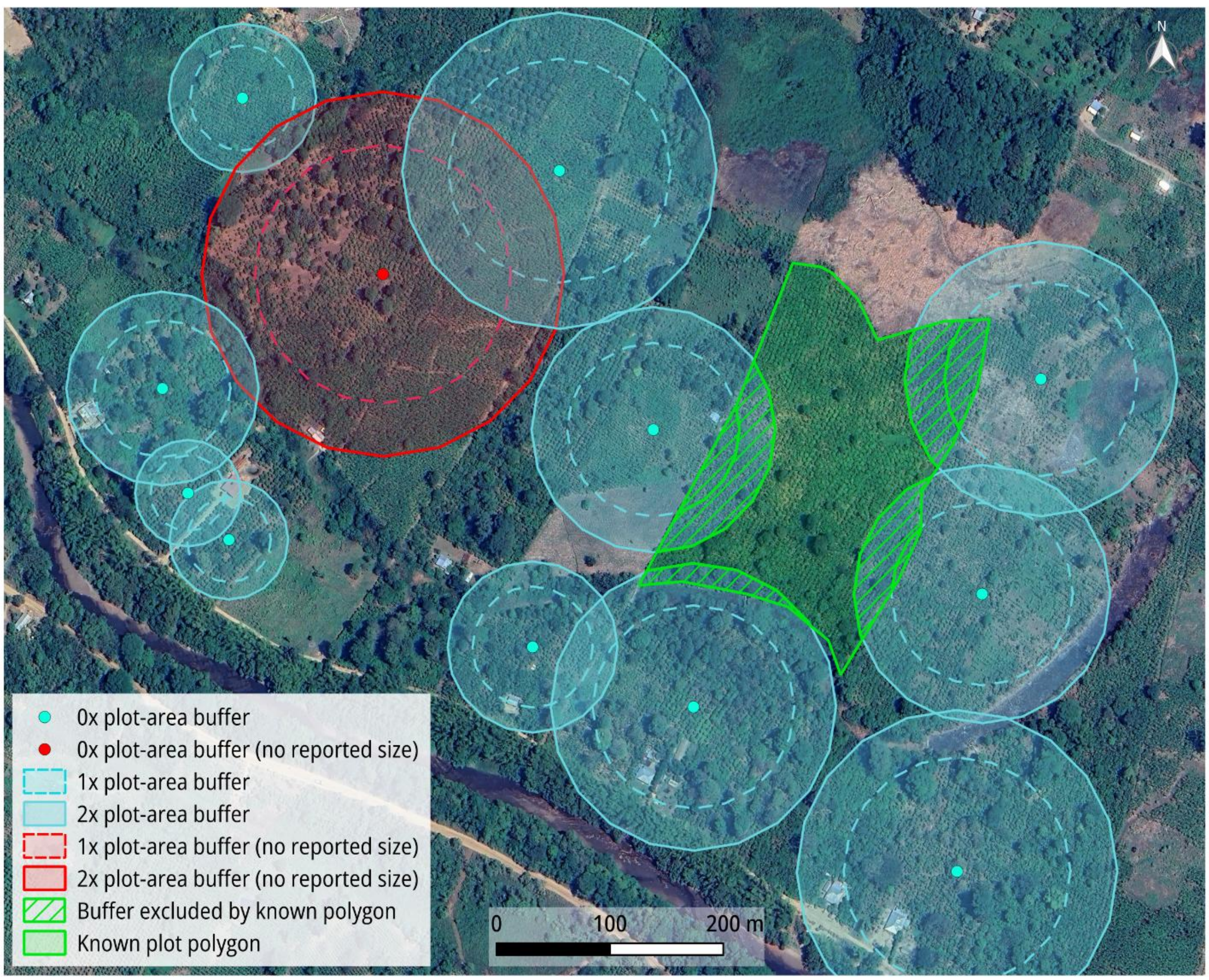

Figure 9. Example of point-based plot buffers.

Most GIS software generates circular buffers using the radius as the input parameter. The radius corresponding to a given plot area can be calculated using the standard circle-area formula:

$$r = \sqrt{\frac{Area}{\pi}} \quad (1)$$

This tiered structure helps assess deforestation risks in densely farmed landscapes with small, adjacent point plots.

7.1.1 Overlap handling

- If a point buffer overlaps with a known polygon plot, the polygon geometry takes precedence, and the point buffer is clipped.
- Other types of overlap should not be removed.

7.2 Output for Risk Assessment

After resolving all overlaps:

- Cleaned buffers and plots are compiled into the risk assessment plot database.
- Buffers are used only to support due-diligence risk assessment, not as a proxy for plot boundaries in due-diligence statements.

8 Deforestation Overlay Analysis

Core methodological requirements

The deforestation analysis identifies plots with a non-negligible risk of deforestation by combining remote sensing tree cover loss data with the integrated forest baseline and the curated plot database. This process ensures that all potential forest loss occurring after the regulatory cut-off date is consistently and transparently assessed. The steps shown in Figure 10 are described below.

8.1 Tree Cover Loss Detection

Core methodological requirements

The analysis begins with tree cover loss data derived from remote sensing change detection systems. These datasets identify areas where tree cover has been removed since the cut-off date (e.g., 31 December 2020 for EUDR compliance). ***Tree cover loss does not automatically indicate deforestation***; further spatial context is required to determine whether the loss occurred within forested areas.

Optional/context-specific enhancements

Within this methodology, stakeholders ensure compliance through annual assessments based on historical tree cover loss data since the cut-off date. Near real-time deforestation alert systems may also be used as a complementary tool to support more timely monitoring and response, but they are not required under this methodology.

8.2 Integration with the Forest Baseline

Core methodological requirements

Tree cover loss data are then combined with the integrated forest baseline, which includes both forest and uncertain areas. Any tree cover loss detected outside the areas classified as forest or uncertain is excluded from the analysis. By intersecting these datasets, the analysis identifies potential deforestation events occurring in zones that were forested (or potentially forested) at the cut-off date. This step generates the first layer of non-negligible deforestation risk.

8.3 Plot Intersection with the Forest Baseline

Core methodological requirements

Each plot in the curated plot database is compared with the integrated forest baseline to determine whether it overlaps with forest or uncertain areas. Plots with no overlap are considered to have no forest present at the cut-off date and therefore no deforestation risk. Plots overlapping with forest or uncertain areas proceed to the next step of analysis.

8.4 Intersection with the Non-negligible Risk Layer

Core methodological requirements

Plots overlapping forest or uncertain areas—defined as locations where the convergence of evidence process does not result in a single, confident land-cover classification (see Figure 7)—are further intersected with the non-negligible deforestation risk layer, which combines the forest baseline and tree cover loss data. This step determines whether any tree cover loss after the cut-off date occurred within or near the plot boundaries.

8.5 Classification of Plot Status

Core methodological requirements

If a plot polygon and its associated buffer show no overlap with areas of non-negligible deforestation risk, the likelihood that deforestation is associated with this plot is considered very low.

8.5.1 Point-Specific Buffer Analysis Procedure

By applying a tiered and conservative attribution logic, the point-specific buffer analysis shown in Figure 1111 determines whether a plot represented as a point is associated with a non-negligible deforestation event.

Core methodological requirements

A point-based plot is considered potentially linked to deforestation only when the deforestation event directly overlaps the point location itself (0× buffer). The analysis therefore begins by checking whether the detected deforestation event directly intersects the point coordinate (0× buffer).

Recommended best practices

If no direct intersection exists, the 1× buffer is assessed. But the point is flagged only if this 1× buffer overlaps the event and no other point's 0× buffer touches the same event. Finally, the 2× buffer (or 1×-2× ring) is evaluated under the same principle: the point is flagged only if this outer 2× ring buffer overlaps the event and no other point's 0× or 1× buffer intersects it. In practice, this procedure ensures that responsibility for a deforestation event is always assigned to the point with the spatial evidence, while reducing cases where multiple points could be incorrectly linked to the same event. However, when a deforestation event is attributed to a point based on the 0× buffer analysis, neighboring points whose 1× or 2× buffers overlap the same event should not automatically be considered fully cleared. In cases where the attribution remains uncertain, these neighboring points should be flagged for visual monitoring or additional verification to confirm that the deforestation event is not associated with their corresponding plots.

Further guidance on verification procedures and evidence requirements is provided in section 10.

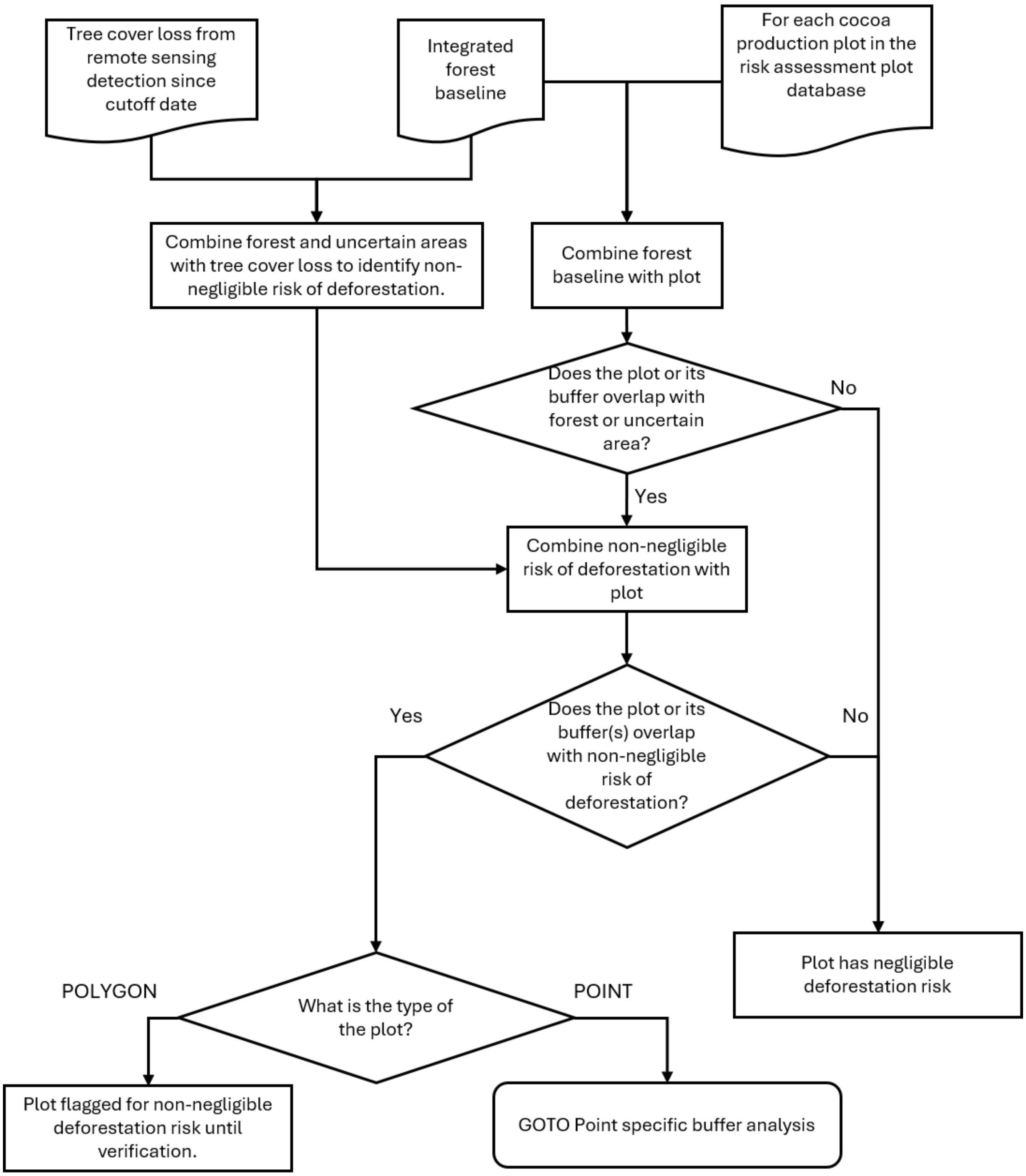

Figure 10 Workflow for deforestation analysis and identification of non-negligible risk of deforestation.

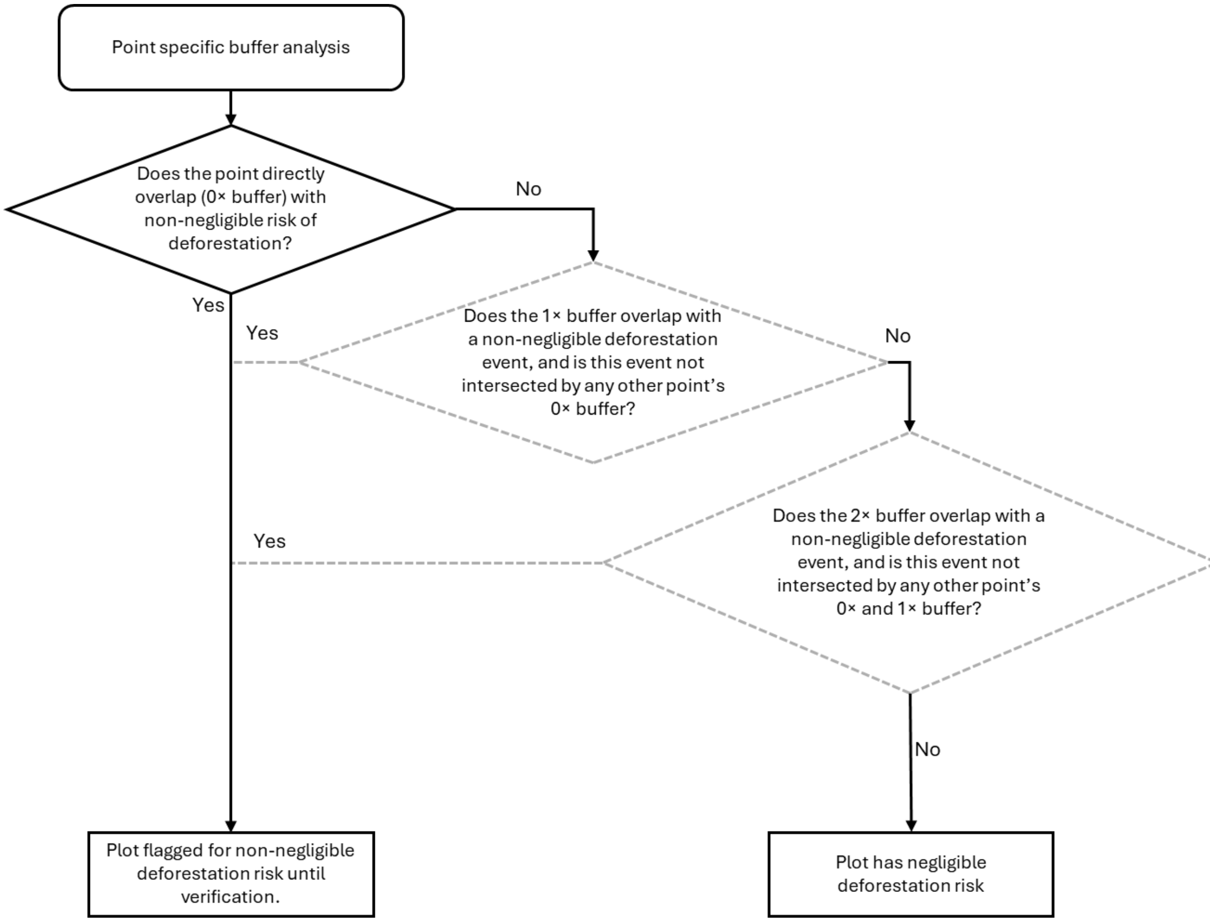

Figure 11. Workflow for deforestation analysis and identification of non-negligible risk of deforestation for points. Steps shown with dashed outlines represent recommended best practices and are not core methodological requirements.

9 Legal Zoning Analysis

The legal zoning analysis ensures that each production plot complies with national and local land-use regulations. It identifies potential conflicts with protected areas, indigenous territories, or special use zones, and verifies whether agricultural activity within these areas is legally permitted. The steps illustrated in Figure 1212 are described below.

9.1 Quality and Use of Legal Zoning Data

Core methodological requirements

Legal zoning datasets used in this methodology, such as protected areas, indigenous or community territories, forest reserves, or other legally designated zones, should follow the same data quality and reliability principles applied to other spatial datasets.

Recommended best practices

Formal third-party certification is not required; however, the use of authoritative and well-documented sources is strongly recommended.

As a best practice, legal zoning layers should be:

- sourced from official or nationally recognized institutions responsible for land-use governance.
- up to date, or the most recent version available.
- accompanied by documentation describing their legal basis, scope, and limitations.

In some contexts, legal zoning datasets may present accuracy or completeness limitations, including imprecise or shifted boundaries, incorrect coordinate systems, outdated designations, or inconsistencies between sources. When such limitations are identified, zoning layers should be used as screening tools to flag potential legal risk, rather than as definitive indicators of non-compliance.

An overlap between a production plot and a protected area or other legally designated zone does not in itself determine non-compliance. Protected area boundaries should therefore be interpreted as indicators of potential legal risk, not as automatic exclusion zones. They should be evaluated within the full local legal context.

A Data Catalogue provided in Annex 4 complements this section by listing the official repositories and datasets used for legal zoning analysis. Where available, it includes direct links to authoritative national or regional sources for protected areas, indigenous lands, and other legally designated zones.

9.1.1 Compilation of Legal Zoning Layers

Core methodological requirements

The process begins with the collection and harmonization of all relevant legal zoning datasets. The scope and content of the legal zoning analysis are country-specific. The analysis must be guided by an assessment of the national and sub-national legal framework governing land use and agricultural activities. Relevant legal zoning layers may include, but are not limited to, protected areas, indigenous or community lands, forest reserves, special-use zones, and other legally designated areas. The selection of which zoning layers to include in the analysis should be informed by an understanding of which legal designations impose restrictions or conditions on agricultural production in the producing country.

Recommended best practices

These datasets should be sourced from official or nationally recognized institutions and be up-to-date, ensuring legal accuracy.

9.1.2 Intersection of Zoning Layers with Plot Database

Each plot in the curated database is spatially compared with the legal zoning layers to identify potential overlaps. This step determines whether a production area lies fully or partially within a zone that is legally restricted or under controlled management.

9.1.3 Identification of Overlaps

Plots that do not overlap with any restricted area are automatically classified as compliant with respect to legal zoning.

Plots that overlap with protected or restricted zones should be classified as non-compliant from a legal status perspective until otherwise verified.

9.1.4 Verification of Farm Legal Status

Core methodological requirements

An overlap between a production plot and a protected area or other legally designated zone does not in itself determine non-compliance. The legal implications of such overlaps must be assessed on a case-by-case basis, taking into account the specific category of the zone, the type of agricultural activity, the date of establishment of the farm, and any applicable legal exemptions or rights under national law. As a result, protected area boundaries should be interpreted as indicators of potential legal risk, rather than as automatic exclusion zones, and must be evaluated within the full local legal context.

Recommended best practices

Thus, for plots with overlaps, the analyst must verify the legal status of the farm to determine whether agricultural activity is explicitly authorized or legally granted within the concerned zone. Evidence may include land-use permits, concession documents, tenure rights, or local government authorizations.

As a best practice, any field verification conducted within protected areas should be carried out in coordination with the competent institutions responsible for managing the forest area, in accordance with applicable national regulations and access requirements.

9.1.5 Classification of Plot Compliance

Core methodological requirements

If legal evidence confirms that agricultural activity is permitted, the plot is classified as compliant with legal zoning. Legal compliance with zoning regulations does not exempt the plot from other EUDR requirements, including non-spatially explicit legal requirements. Such plots must still undergo deforestation analysis and demonstrate no forest conversion after the cut-off date to be fully compliant.

If the verification process showed no legal permission was provided to the farm, the plot is flagged as non-compliant with respect to land-use regulations.

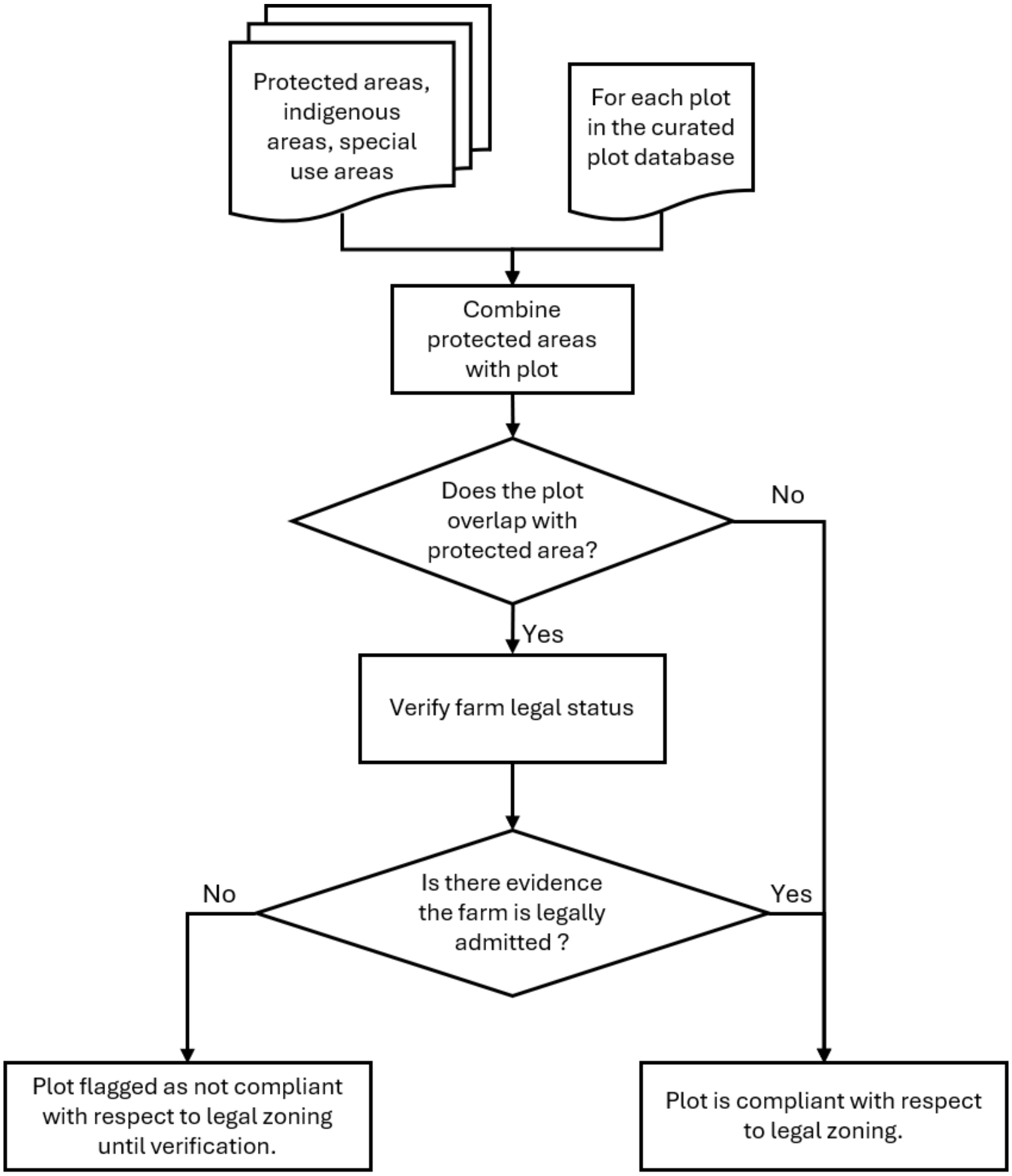

Figure 12. Workflow for legal zoning analysis to determine compliance of plots with land-use regulations.

9.2 Point data near protected areas

Recommended best practices

This subsection outlines the procedure for identifying and addressing point-based plots that may overlap with protected or legally restricted areas. Since single GPS points lack boundary precision, such cases require further investigation to confirm their legal status. Figure 13 describes the steps to detect potential overlaps and to prioritize follow-up actions.

9.2.1 Identify Relevant Datasets

The process begins with the compilation of all available and officially recognized legal zoning datasets, including protected areas, indigenous territories, and special use zones. These datasets serve as the reference for verifying whether plots fall within or near legally restricted areas.

9.2.2 Buffering and Spatial Intersection

Each point from the curated plot database is assigned a buffer area representing the estimated extent of the production plot (2× the reported plot size, or 4 hectares if unspecified). This buffered area is then intersected with the legal zoning layers to check for possible spatial overlaps.

9.2.3 Detect Overlap with Protected Areas

If a point's buffer overlaps with a protected area, indigenous territory, or other special use zone, the plot is considered non-compliant under legal zoning until its actual boundaries and legal status are verified.

9.2.4 Prioritize Polygon Data Collection

Plots identified as potentially overlapping restricted areas are prioritized for polygon data collection. Obtaining accurate perimeter data allows for a more reliable reassessment to confirm whether the farm is located inside or outside the restricted zone and whether agricultural activity is legally permitted.

Plots with no overlap detected between their buffers and legal zoning layers are considered compliant but should remain subject to periodic review as zoning data are updated.

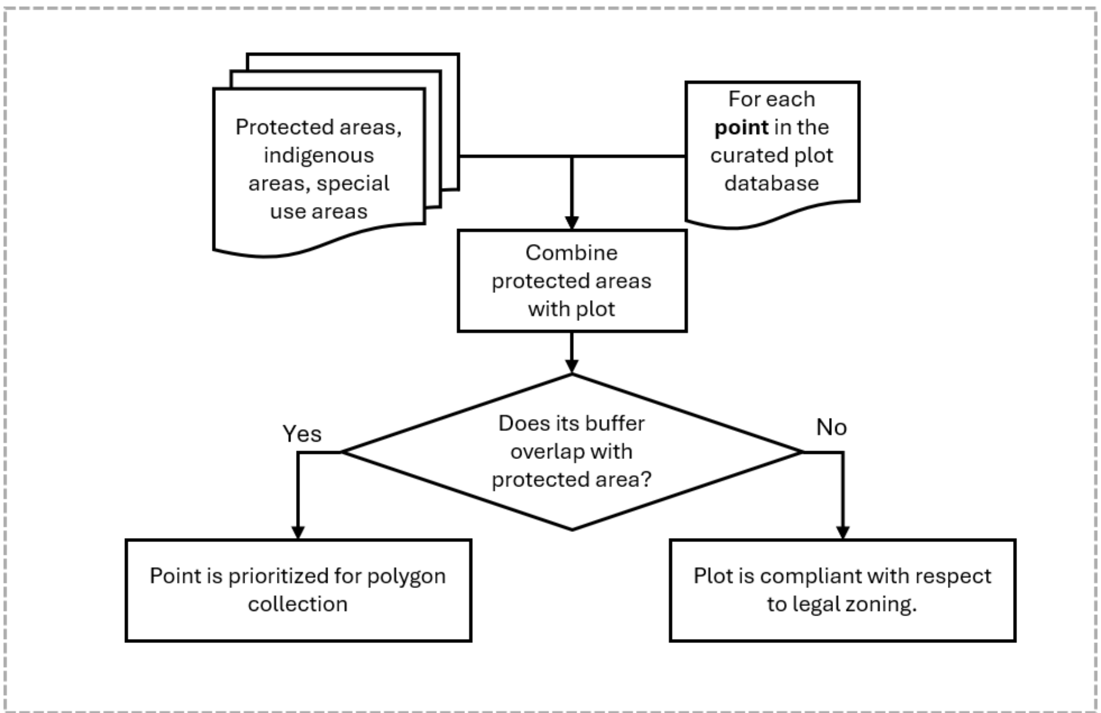

Figure 13. Workflow for management of point data overlapping protected areas.

10 Verification

Verification—a critical step in the deforestation risk assessment process—ensures that remote sensing-based results are accurate and fair. Minimizing the risk of including products from areas with non-negligible risk of deforestation is central to compliance regulations such as EUDR. However, it is equally important to avoid the unjust exclusion of smallholder producers from EU markets based on unverified or uncertain data. To achieve this balance, this protocol strongly recommends implementation of robust verification protocols to mitigate the risk of wrongful exclusion.

Recommended best practices

Desk-based verification using remote sensing and available documentation or high-resolution satellite imagery may be sufficient to support the redirection of production to an alternative pipeline (e.g., a non-EU market pipeline in the context of the EUDR). However, temporary or permanent exclusion of a farmer from a supply chain should ideally occur only after field verification has been conducted. See more details in the mitigation protocol presented in section 11.

10.1 Verification Using High-Resolution Imagery

Core methodological requirement: Verification using high-resolution imagery should be integrated into the deforestation risk assessment process to support the confirmation or rejection of suspected deforestation events identified through automated analyses (Figure 14). Recognizing operational and data availability constraints, companies may define and document a risk-based approach to prioritize which cases are subject to high-resolution imagery verification. This requirement applies only where suitable high-resolution imagery is reasonably available for the relevant location and period.

When available, historic high-resolution imagery can serve as a powerful verification tool. It can demonstrate that agricultural activity was already established before the cut-off date, confirming that no deforestation occurred in violation of the protocol. This approach is particularly valuable when land cover changes occurred several years ago, and on-the-ground evidence is no longer visible.

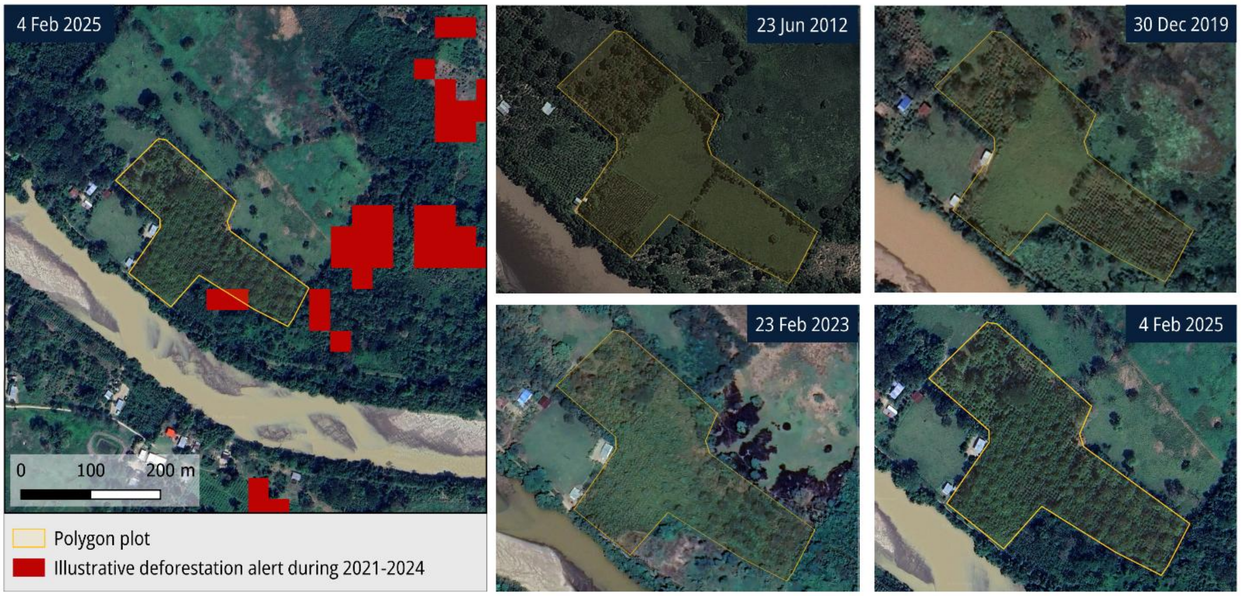

Figure 14. Verification of deforestation alerts using historical high-resolution imagery. In this example, the imagery clearly shows that deforestation did not occur after 2020, indicating that the forest baseline should be corrected.

10.2 Verification Using Ancillary Data

Verification can also rely on documentary or spatial evidence from trusted sources. Cadastral data can prove that land was under agricultural use before the cut-off date. Certification audit records can confirm deforestation-free production. This evidence can be used to validate compliance and challenge false detections from remote sensing analyses. These ancillary datasets provide an additional layer of confidence, particularly where satellite interpretation is ambiguous.

Verification may also rely on proxy data sources, such as agricultural surveys, extension service records, or similar datasets, provided they can be reliably linked to a specific geographic location. When used, such proxy data should be documented and assessed for relevance, spatial accuracy, and temporal consistency with the period under review.

10.3 Verification Through Field Visits

Recommended best practices

Temporary or permanent exclusion of a farmer from a supply chain should ideally occur only after field verification has been conducted, particularly where uncertainty remains regarding the extent, location, or legality of the detected deforestation event.

Furthermore, field verification should be reserved for specific cases. These cases include situations where high-resolution imagery close to the baseline date is unavailable, or where recent imagery needed to validate detected non-negligible deforestation risk has not yet been released. Field verification is also recommended for complex land-use situations, such as fallow lands or dense agroforestry systems, where remote sensing interpretation alone might prove insufficient to make a reliable decision. Field verification is particularly effective when recent deforestation signals are detected and physical evidence remains visible on the ground. Field visits allow for direct observation of vegetation, land use, and farm management practices, helping to confirm or refute suspected deforestation events.

10.4 Documentation and Feedback

All verification activities must be systematically documented, detailing the methods, data sources, and conclusions used to confirm or reject potential deforestation events. Importantly, results, especially those proving plots to be compliant and free of forest cover, should be shared through a structured feedback loop with the producers of forest baseline and change detection datasets. This process helps refine future maps, reduce false positives, and continuously improve detection accuracy across the monitoring system. Digital field-based tools, such as the Deforestation Verification App developed by Mars Wrigley and shared through the World Cocoa Foundation, illustrate best-practice approaches for supporting deforestation verification (WCF, 2023). Such tools can help systematically document verification activities by linking geo-referenced field observations, photographs, and metadata to specific locations. When appropriately implemented, these tools can improve consistency, traceability, and transparency in the verification process. They complement other evidence sources.

11 Mitigation Protocol

Recommended best practices

The mitigation protocol presented in this section, including all its sub-components, should be interpreted as a set of recommended best practices intended to support consistent and proportionate responses to identified deforestation risks. These recommendations may be adapted to operational realities, local contexts, and the specific roles and capacities of the actors involved.

11.1 Plots verified as having a non-negligible risk of deforestation

This Mitigation Protocol defines a standardized response procedure for handling plots verified as having a non-negligible risk of deforestation. Its purpose is to ensure that all cases are managed transparently and consistently while maintaining fairness toward producers and ensuring compliance with EUDR requirements.

The steps outlined in Figure 15 describe the recommended sequence of actions in cases where non-negligible deforestation risk is identified.

We acknowledge the role of industry in preventing cocoa-driven deforestation. However, specific corrective measures should be bilaterally agreed upon between buyers and sellers to ensure that mitigation actions are proportionate to each party's operational scope, responsibilities, and financial capabilities. All stakeholders should contribute effectively to the prevention and remediation of deforestation risks.

11.1.1 Identification of Plots with Verified Non-negligible Risk

The process begins with plots confirmed through verification—by remote sensing, ancillary data, or field checks—as having a non-negligible risk of deforestation.

11.1.2 Determination of Plot Type

The type of geolocation data, polygon or point, guides the next steps:

Polygon plots can be more confidently assessed and are therefore redirected to non-EU markets if non-negligible risk is verified.

Point-based plots flagged due to non-negligible risk of deforestation within their 0× buffer (i.e., at the point coordinate) should be temporarily redirected to non-EU market pipelines and enter enhanced due diligence. This should include priority polygon data collection within the year to improve spatial precision and allow for a more accurate reassessment. Once updated polygon boundaries are available, the plot should be re-evaluated to determine whether it still overlaps with areas of non-negligible deforestation risk. If the reassessment confirms compliance, the plot may be reintegrated into the EU market pipeline. If the plot remains non-compliant, it should proceed to the final removal and mitigation steps.

Point-based plots flagged due to buffer-related uncertainty should also enter enhanced due diligence, including priority polygon data collection within the year. In these cases, purchases do not need to be suspended, as the plots are not classified as non-compliant. Instead, operators should apply additional monitoring measures and reassess compliance once accurate polygon geometries become available.

11.1.3 Removal and Mitigation Procedures

Plots that remain non-compliant after verification and polygon reassessment must be redirected to non-EU market pipelines. Operators should then initiate mitigation procedures, which are described in the next section.

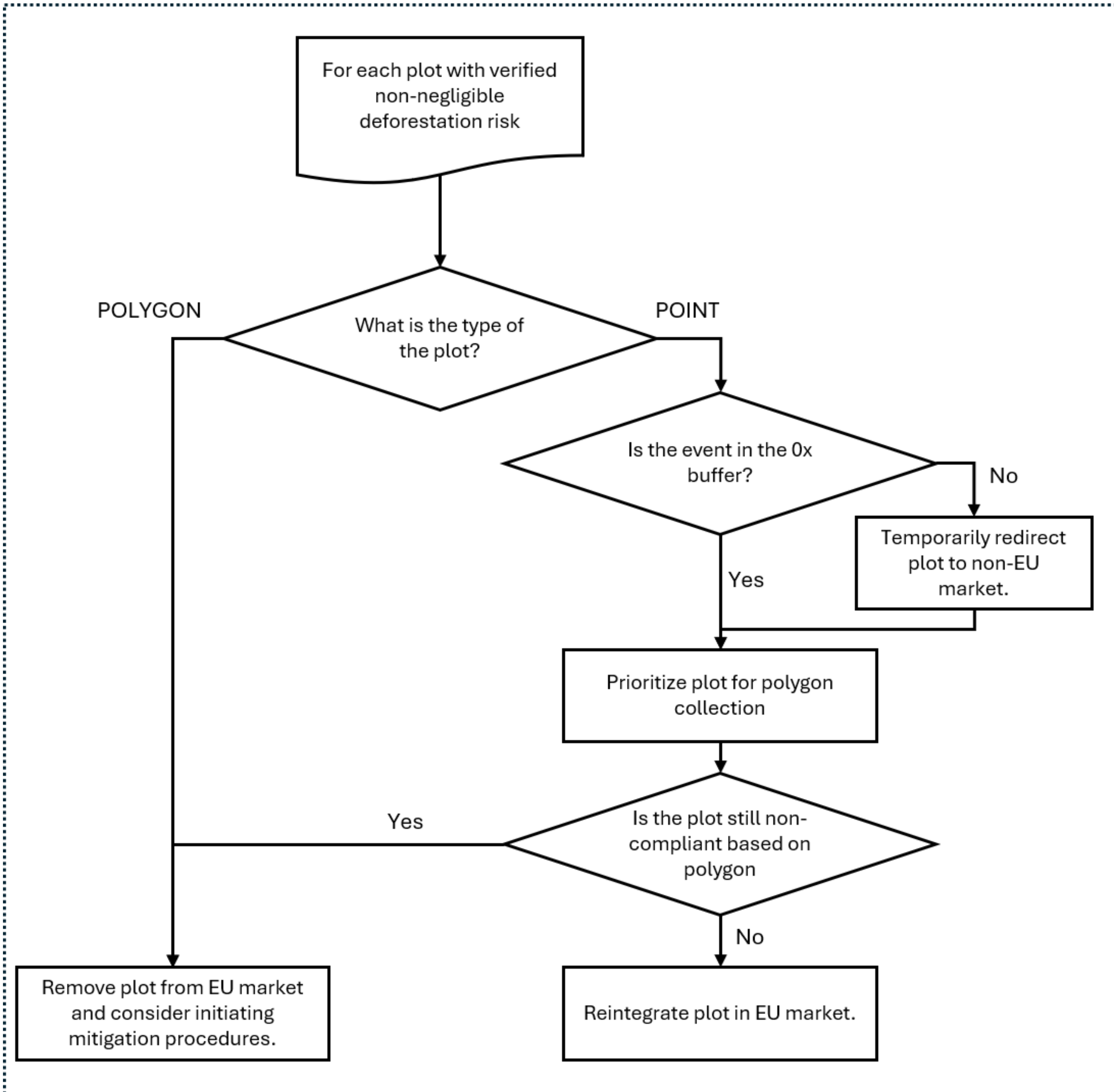

Figure 15. Workflow for the Mitigation Protocol applied to plots with verified non-negligible deforestation risk.

11.2 Corrective Actions for Plots Removed from the EU Market

This section outlines the decision-making process and corrective actions for plots that have been removed from the EU market following verification of a non-negligible risk of deforestation. The procedure ensures a proportionate and transparent response, balancing accountability with opportunities for improvement. Figure 16 below illustrates the main steps.

11.2.1 Identification of Removed Plots

The process begins with plots that were removed from the EU market after being confirmed as non-compliant due to verified deforestation. These plots are reviewed individually to determine whether additional mitigation or engagement actions should be taken.

11.2.2 Assessment of Deforestation History

The first decision point assesses whether the farmer has a history of involvement in deforestation.

Procurement from a farm should be stopped indefinitely if the farmer has been previously linked to deforestation events since the cutoff date, as defined by this methodology. This situation indicates a recurring compliance issue. Although not required for the EUDR, stopping procurement is a best practice for risk management under these circumstances.

If this is the first recorded instance, the process continues to evaluate the extent of the deforested area.

11.2.3 Evaluation of Deforested Area

The extent of deforestation is then analyzed to determine the appropriate level of response:

This mitigation protocol is based on the Accountability Framework Initiative (Afi). AFi does not prescribe fixed hectare-based thresholds to determine the appropriate response to deforestation events. Instead, it refers to the concept of a "minimal level" of deforestation and promotes a proportionate, risk-based approach, where the severity of non-compliance is assessed through dimensions such as scale, intensity, and persistence. AFi further specifies that deforestation and conversion should be assessed cumulatively over space and time, noting that "multiple small instances of conversion may lead to a producer being considered non-compliant with commitments" (AFi, 2026), Definitions, "Minimal level".

The extent of deforestation is therefore analyzed using one of the following two approaches to determine the appropriate level of response:

a) Fixed absolute threshold

If the cumulative deforested area exceeds 0.25 hectares, which represents 10% of the average area of cocoa plot, procurement from the farm should be suspended for one year. During the suspension period, corrective actions such as restoration, replanting, or capacity-building measures are implemented to prevent recurrence. After one year, the affected production may be redirected to non-EU markets

If the deforested area is equal to or smaller than 0.25 hectares, the affected production may be redirected to non-EU markets. In such cases, corrective actions should still be initiated to address the issue, ensure no further deforestation, and strengthen monitoring and compliance.

b) Relative threshold based on plot size

If the cumulative deforested area exceeds 10% of the production area (plot size), capped at a maximum of 1 hectare, procurement from the farm should be suspended for one year. During the suspension period, corrective actions such as restoration, replanting, or capacity-building measures are implemented to prevent recurrence. After one year, the affected production may be redirected to non-EU markets.

If the deforested area is equal to or smaller than this threshold, the affected production may be redirected to non-EU markets. In such cases, corrective actions should still be initiated to address the issue, ensure no further deforestation, and strengthen monitoring and compliance.

Companies should select one of these two approaches and apply it consistently across their operations and supply chains. Mixing approaches on a case-by-case basis should be avoided to ensure transparency, fairness, and comparability of implementation.

11.2.4 Implementation of Corrective Actions

For all applicable cases, producers and supply chain partners should work together to design and implement corrective action plans. These may include improved farm mapping, training on land-use regulations, adoption of no-deforestation commitments, or participation in landscape restoration efforts.

Corrective actions and restoration approaches should be developed in line with the principles and recommendations outlined in the Accountability Framework Initiative (AFi) Operational Guidance on Environmental Restoration and Compensation, particularly Section 2 on effective environmental restoration and conservation (AFi, 2019). The AFi guidance provides further recommendations regarding proportionality of restoration efforts, ecological equivalence, use of native species, long-term monitoring, landscape-level considerations, and the design of context-appropriate restoration and compensation measures, including those in smallholder settings.

11.2.5 Follow up after Implementation

Stakeholders should ensure appropriate follow-up activities after restoration actions are completed. Once restoration is finalized and the non-compliant portion of the plot has been removed or restored, the remaining productive area should be remapped with the updated polygons recorded in the database. Without this update, satellite monitoring systems may continue to associate the original plot geometry with the detected deforestation event, causing the plot to remain incorrectly flagged as non-compliant in subsequent analyses.

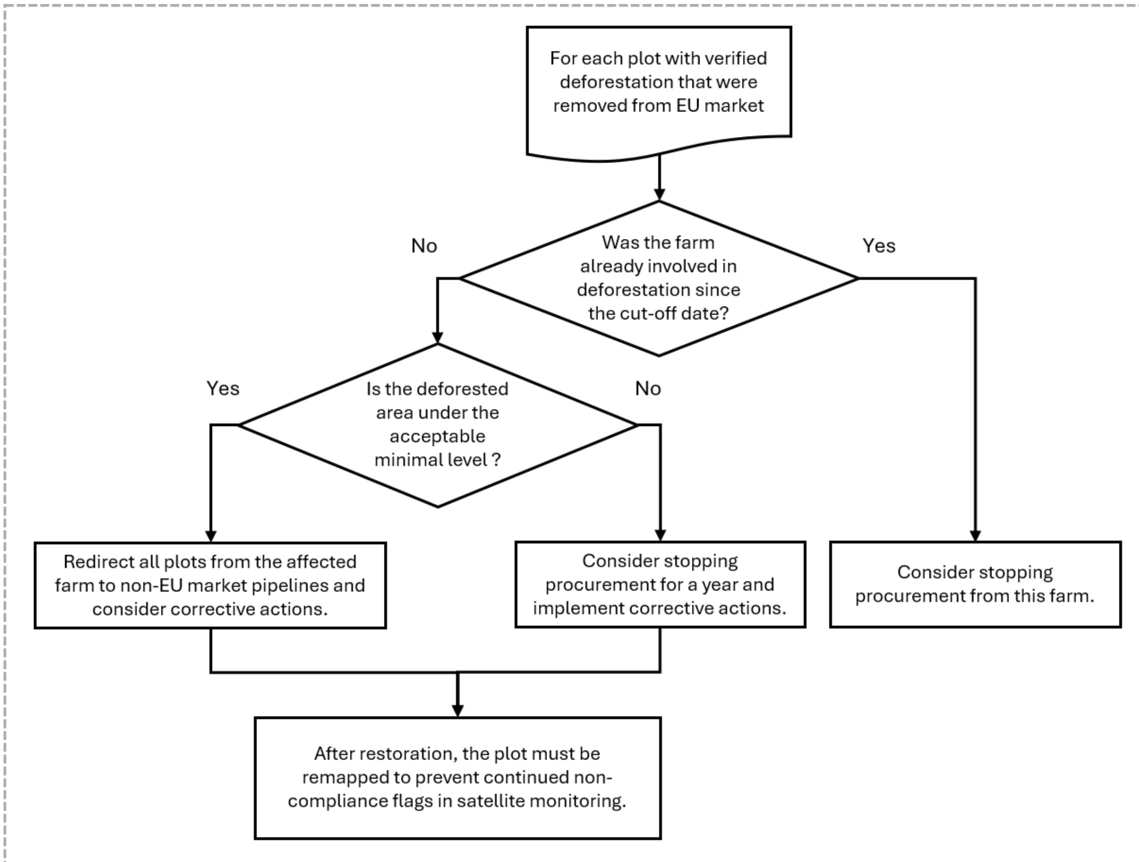

Figure 16. Workflow for mitigation actions on plots removed from the EU market due to verified non-negligible deforestation risk.

11.3 Management of Point Data with future risk of Non-Compliance

11.3.1 Point data near forests

This subsection outlines the preventive procedure for identifying and managing point data plots that, while currently compliant, are located near forested or uncertain areas and may therefore present a potential risk of future non-compliance. The goal is to anticipate and address these risks through improved data precision and monitoring. The main steps illustrated in Figure 17 are described below.

a) Identification of Point Data Plots

The process applies specifically to plots represented by a single GPS point, typically those smaller than four hectares. These plots are extracted from the curated plot database for targeted analysis, given their higher level of spatial uncertainty compared to polygon data.

b) Buffering and Spatial Comparison

Each point is surrounded by its buffer area (2× the reported plot size, or 4 hectares when no area is specified) to simulate the likely extent of the plot. The integrated forest baseline is then combined with this buffered area to determine whether the plot is located close to or within forest or uncertain zones.

c) Threshold for Potential Risk

If 10% or more of the buffered area overlaps with forest or uncertain zones, the plot is considered to have a potential future risk of non-compliance.

d) Prioritization for Polygon Data Collection

Plots identified as high-risk are prioritized for polygon data collection to improve spatial accuracy and allow for more reliable deforestation risk assessments. This step ensures that, in future monitoring cycles, the plot's status can be determined with greater confidence.

Plots with less than 10% overlap are considered compliant but should remain part of ongoing monitoring to detect any new changes that might affect their compliance over time.

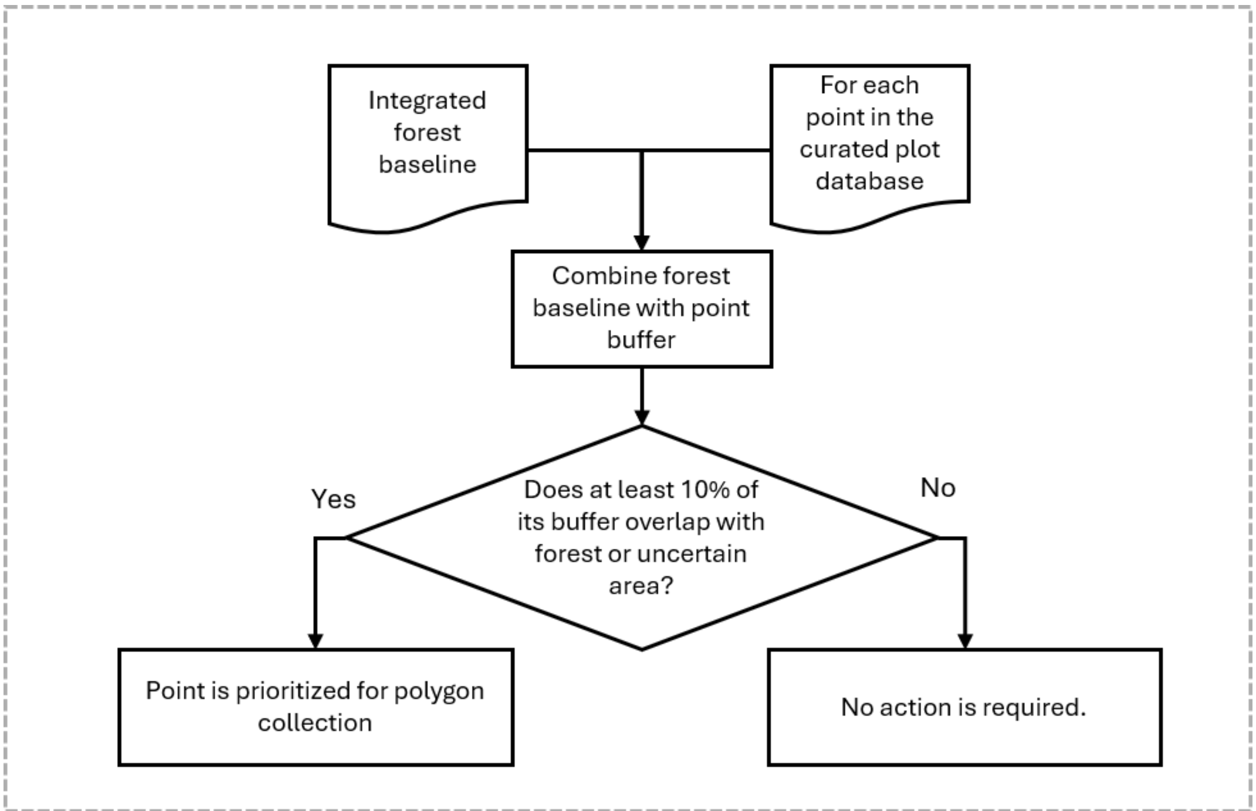

Figure 17 Workflow for management of point data close to forests.

In addition, plots represented by polygons for which deforestation has been detected within their buffer area during the risk assessment step should be prioritized for updating their boundaries, to better capture potential plot expansion or boundary inaccuracies.

11.3.2 Enforcement context and prioritization

The level of management and enforcement in and around forested areas can vary significantly across and within countries. Where information on enforcement strength, management plans, or boundary monitoring is available, it may be used to help prioritize polygon data collection, particularly for plots located near forested zones with weak or inconsistent enforcement.

In such contexts, prioritization can support more targeted risk management. The effort may help identify opportunities for collaboration with national or local systems to strengthen boundary enforcement and reduce future deforestation risk. This consideration is recommended as a complementary input where relevant information exists, recognizing that enforcement-related data are not consistently available across all producing countries.

11.4 Polygon Boundary Update and Maintenance

Polygon plots already provide the most reliable representation of plot boundaries. To help manage the risk of deforestation that may occur after plot boundaries were collected in the field, particularly in cases where polygons are not updated on an annual basis, the methodology recommends generating a 30-meter buffer around each polygon (Figure 18). The 30-meter buffer distance was selected as a compromise, wide enough to capture potential near-boundary deforestation or plot expansion, while remaining sufficiently limited to avoid attributing deforestation risk that is unlikely to be linked to the plot.

This buffer is intended to capture potential nearby deforestation associated with plot expansion into adjacent forested areas over time. It does not replace or modify the polygon itself and is used solely to contextualize nearby risks for internal company due diligence and to inform potential mitigation or follow-up actions.

The use of a polygon buffer is considered good practice under this methodology but is not mandatory nor required for EUDR compliance. Companies may adopt its use as they see fit based on update frequency of plot boundaries, local deforestation dynamics, and their internal risk management procedures.

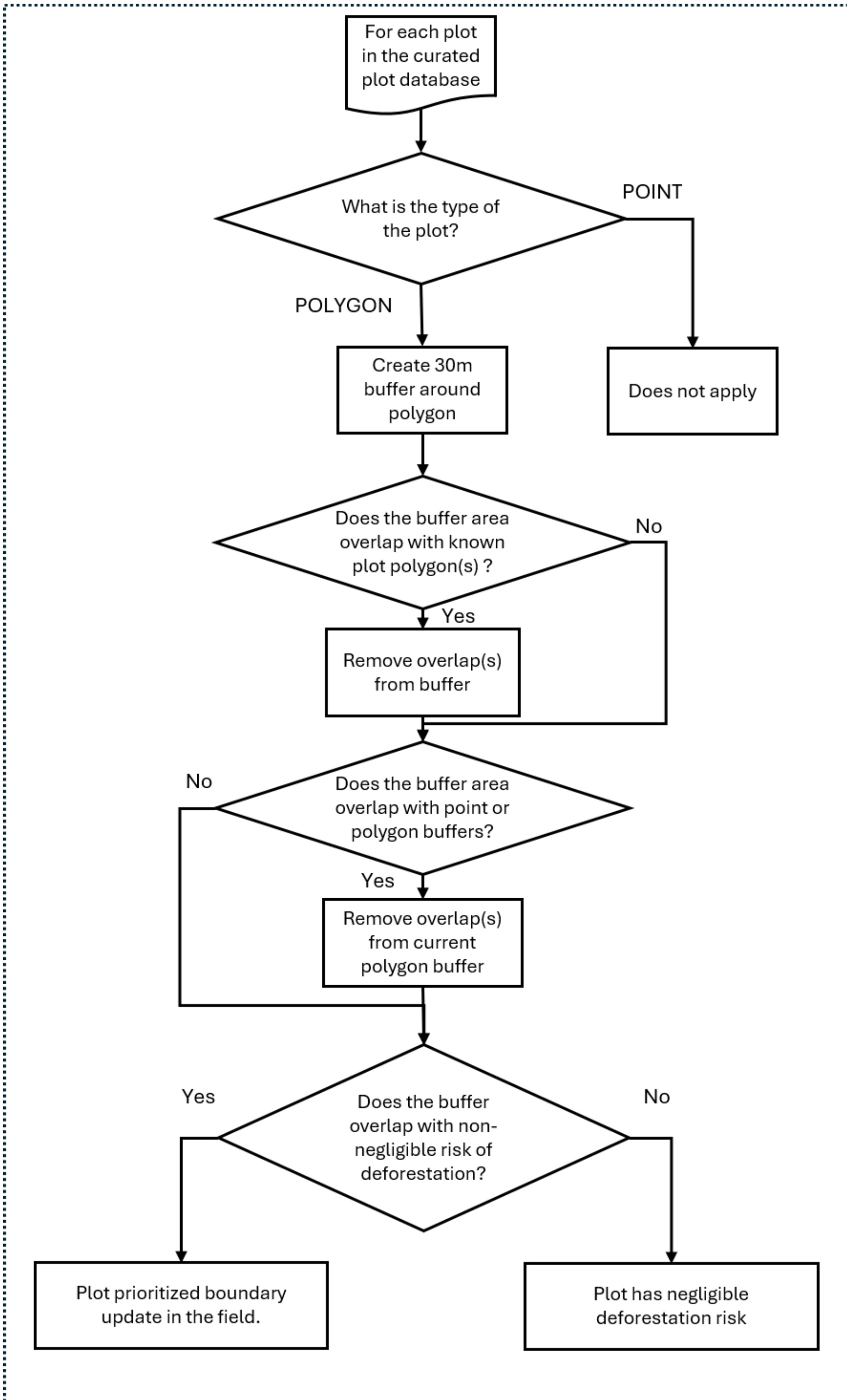

Figure 18. Workflow polygon boundary update and maintenance.

11.4.1 Overlap handling

- If the polygon buffer overlaps with known polygon boundaries from other plots, those overlapping sections are removed from the buffer.
- If the polygon buffer overlaps with *point buffers*, the point buffer boundaries take precedence, and the polygon buffer is clipped accordingly.

11.4.2 Buffer overlaps with non-negligible risk of deforestation

If the polygon buffer overlaps with areas of non-negligible deforestation risk, this should primarily be interpreted as an indicator that the plot boundaries may require updating, rather than as direct evidence of deforestation within the registered plot. Deforestation detected in the buffer area may signal that the cultivated area has expanded beyond the originally recorded boundaries after the plot was mapped. In such cases, the plot should be prioritized for boundary update campaigns, after which the deforestation risk assessment can be repeated using the updated geometry.

12 References and Annexes

12.1 References

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12.2 Annex 1 – Summary of core methodological requirements

5 Plot Data Collection and Quality Assurance	
5.1.1 Geolocation format	Data must be provided in WGS84 projection (EPSG:4326) using decimal degrees (no degree symbols or N/S/E/W) with at least 6 decimal places.
5.1.2 Geolocation Data Quality Requirements	Because positional accuracy varies depending on device quality and environmental conditions (e.g., canopy cover, terrain, satellite availability), data collectors should allow sufficient time for the device to stabilize before recording coordinates. Positional quality should be evaluated and recorded using the Estimated Positional Error (EPE) or horizontal accuracy metric displayed by the device.
5.1.3 Data format	All coordinates should be stored in a consistent GIS data management structure, such as GeoPackage, Shapefile, GeoJSON, or spatial database systems such as PostgreSQL/PostGIS. The selected format should support consistent geometry management and attribute storage. **Note:** Within the scope of the EUDR, all coordinates must be submitted in a consolidated GeoJSON file, subject to the maximum file size limits defined by the regulation (currently 25 MB per file).
5.1.5 Plot Geolocation Data Types	Polygons are required for plots larger than 4 ha and should represent the exact perimeter of each production plot using coordinates recorded to at least six decimal places. Points may be used for plots under 4 ha to satisfy EUDR geolocation requirements. When point data are used, the point should be collected as close as possible to the true center of the production plot.
5.2.1 Point Quality Requirements	When plot geolocation is provided as a single point, the point should be collected within the production plot and as close as possible to its center, so that it best represents the spatial location of the plot. Points should not be collected on houses, roads, or other non-productive features.
5.2.2 Administrative consistency	Verify that all polygons or points fall within the correct administrative boundaries (e.g., country, region, district) as indicated in the accompanying metadata.
6 Baseline Definition and Validation	
6.1 Baseline Definition	The forest baseline serves as the reference layer against which potential deforestation is assessed. A forest baseline aligned with the selected regulatory or methodological cut-off date must be used as the reference layer for assessing potential deforestation. The baseline may be derived from a forest map, land-cover map, or equivalent dataset, provided that it identifies forest areas in accordance with the forest definition adopted in this methodology. Regardless of the source or methodology used, the selected baseline must be transparent, documented, and appropriate

	for the local context, and its limitations should be clearly understood and communicated.
8 Deforestation Overlay Analysis	
8 Deforestation Overlay Analysis	The deforestation analysis identifies plots with a non-negligible risk of deforestation by combining remote sensing tree cover loss data with the integrated forest baseline and the curated plot database. This process ensures that all potential forest loss occurring after the regulatory cut-off date is consistently and transparently assessed.
8.1 Tree Cover Loss Detection	The analysis begins with tree cover loss data derived from remote sensing change detection systems. These datasets identify areas where tree cover has been removed since the cut-off date (e.g., 31 December 2020 for EUDR compliance). Tree cover loss does not automatically indicate deforestation; further spatial context is required to determine whether the loss occurred within forested areas.
8.2 Integration with the Forest Baseline	Tree cover loss data are then combined with the integrated forest baseline, which includes both forest and uncertain areas. Any tree cover loss detected outside the areas classified as forest or uncertain is excluded from the analysis. By intersecting these datasets, the analysis identifies potential deforestation events occurring in zones that were forested (or potentially forested) at the cut-off date. This step generates the first layer of non-negligible deforestation risk.
8.3 Plot Intersection with the Forest Baseline	Each plot in the curated plot database is compared with the integrated forest baseline to determine whether it overlaps with forest or uncertain areas. Plots with no overlap are considered to have no forest present at the cut-off date and therefore no deforestation risk. Plots overlapping with forest or uncertain areas proceed to the next step of analysis.
8.4 Intersection with the Non-negligible Risk Layer	Plots overlapping forest or uncertain areas are further intersected with the non-negligible deforestation risk layer, the combined output of the forest baseline and tree cover loss data. This step determines whether any tree cover loss after the cut-off date occurred within or near the plot boundaries.
8.5 Classification of Plot Status	If a plot polygon shows no overlap with areas of non-negligible deforestation risk, the likelihood that deforestation is associated with this plot is considered very low

8.5.1 Point-Specific Buffer Analysis Procedure	A point-based plot is considered potentially linked to deforestation only when the deforestation event directly overlaps the point location itself (0× buffer). The analysis therefore begins by checking whether the detected deforestation event directly intersects the point coordinate (0× buffer).
9 Legal Zoning Analysis	
9.1 Quality and Use of Legal Zoning Data	Legal zoning datasets used in this methodology, such as protected areas, indigenous or community territories, forest reserves, or other legally designated zones, should follow the same data quality and reliability principles applied to other spatial datasets.
9.1.1 Compilation of Legal Zoning Layers	The process begins with the collection and harmonization of all relevant legal zoning datasets. The scope and content of the legal zoning analysis are country-specific. The analysis must be guided by an assessment of the national and sub-national legal framework governing land use and agricultural activities. Relevant legal zoning layers may include, but are not limited to, protected areas, indigenous or community lands, forest reserves, special-use zones, and other legally designated areas. The selection of which zoning layers to include in the analysis should be informed by an understanding of which legal designations impose restrictions or conditions on agricultural production in the producing country.
9.1.5 Classification of Plot Compliance	If legal evidence confirms that agricultural activity is permitted, the plot is classified as compliant with legal zoning. Legal compliance with zoning regulations does not exempt the plot from other EUDR requirements, including non-spatially explicit legal requirements. Such plots must still undergo deforestation analysis and demonstrate no forest conversion after the cut-off date to be fully compliant. If the verification process showed no legal admission was provided to the farm, the plot is flagged as non-compliant with respect to land-use regulations.
10 Verification	
10.1 Verification Using High-Resolution Imagery	Verification using high-resolution imagery should be integrated into the deforestation risk assessment process to support the confirmation or rejection of suspected deforestation events identified through automated analyses. Recognizing operational and data availability constraints, companies may define and document a risk-based approach to prioritize which cases are subject to high-resolution imagery verification. This requirement applies only where suitable high-resolution imagery is reasonably available for the relevant location and period.

12.3 Annex 2 – Summary of recommended best practices

5 Plot Data Collection and Quality Assurance	
5.1.2 Geolocation Data Quality Requirements	Monitor geolocation accuracy during data collection. Record coordinates only when horizontal accuracy (EPE) is ≤5 m where feasible, and flag lower-accuracy records for potential future improvement.
5.1.4 Data Update Frequency	Maintain up-to-date geolocation data through periodic updates. Incorporate new plots into geolocation databases at least annually, prioritize annual updates for high-risk plots, and review geolocation data in lower-risk areas at least every five years.
5.1.5 Plot Geolocation Data Types	Polygons provide greater spatial context and reduce the risk of both overlooking deforestation within a plot and misattributing deforestation to the wrong plot. For this reason, polygons are recommended as the preferred data type for geolocation collection whenever feasible. If resources are limited and high-quality polygon collection cannot be ensured, a well-positioned point collected at the true center of the plot can be more reliable than a poorly captured polygon. In such contexts, point data may represent an acceptable alternative, provided that the plot area is under 4 ha and the reported plot area is included whenever possible. High-quality polygon data are particularly recommended in higher-risk areas, such as regions near forests or where deforestation pressure is elevated, as they provide greater spatial precision for downstream risk analysis.
5.2.3 Contextual overlay checks	Where reference datasets are available, polygons and points should also be overlaid with water body and urban area maps to flag plots that fall partially or fully within clearly non-agricultural land uses. Such cases should be reviewed, as they may indicate misplaced geometries or administrative inconsistencies in the underlying plot data.
5.2.4 Geometry consistency	Review polygon geometry realism and consistency by checking for unrealistic plot sizes, sharp angles, spikes, self-intersections, artificial connecting strips, and other irregular shapes that may indicate data collection or digitization errors. Polygon shape metrics (e.g., roundness and area-to-bounding-box ratios) can be used as screening tools to identify polygons requiring review.
5.2.5 Polygon Overlap within the Database	Identify and progressively eliminate overlapping polygons. Minor overlaps attributable to GPS uncertainty may be tolerated or corrected automatically using consistent rules, while major overlaps should be reviewed using imagery and, where necessary, field verification to confirm correct boundaries and remove duplicates.
5.2.6 Data Quality in Protected Areas	Use polygon-based geolocation for plots located within or adjacent to protected or classified forest areas, regardless of their size, and verify any overlap with protected forest zones.
5.2.7 Production Capacity Consistency Check	Conduct production capacity consistency checks by comparing reported sourcing volumes with the expected production potential of the mapped production area. Use indicative yield ranges to identify implausibly high or low volumes that may indicate mapping errors, reporting inconsistencies, or sourcing from undeclared plots.

5.2.8 Overlap Management Across Supply Chains	Manage overlapping plots across supply chains using a risk-based approach. Harmonize overlaps within the same provider or supply-chain structure, and progressively identify and resolve duplication and major overlaps between different providers while recognizing current operational constraints.
5.2.9 Visual inspection	Perform visual inspection using high-resolution imagery for plots flagged by automated quality checks. Prioritize polygons or points with unusual geometries, sizes, or other inconsistencies that cannot be confidently assessed through automated spatial analysis alone.
5.2.10 Recommended Metadata	Maintain key metadata alongside plot geolocation data. Where available, record information such as mapping date, plot area, establishment year, administrative location, data source, and unique plot or farmer identifiers to improve data quality, traceability, and interpretation.
6 Baseline Definition and Validation	
6.1 Baseline Definition	Develop forest baselines using a convergence of evidence approach. Combine multiple forest and tree crop datasets, weighted by their quality and accuracy, to reduce the limitations of individual sources and improve the reliability of forest classification, particularly in complex cocoa and agroforestry landscapes.
6.1 Baseline Definition	Conduct and document independent accuracy assessments for forest baseline datasets. Use representative validation samples, report class-level accuracy metrics with confidence intervals, and prioritize datasets with higher validated accuracy. Independent third-party validation is encouraged, particularly for datasets used as primary decision layers.
6.2.5 Integration of Ancillary Data, Verified Compliant Plots, and Fallow Lands	Use ancillary datasets to refine forest baselines. Incorporate reliable information on agroforestry systems, fallow lands, and verified compliant plots to reduce misclassification between forests and agricultural land. Prioritize trusted ancillary data sources. Use datasets with documented collection methods, known spatial accuracy, regular updates, and, where possible, independent validation or audit. Conduct spot-check validation of ancillary datasets. Validate a representative sample using high-resolution imagery or other independent evidence to assess consistency and reliability. Use verified agroforestry and compliant plot information to correct forest baselines. Reclassify areas identified as agricultural prior to the cut-off date where sufficient evidence demonstrates that forest was not present at that time. Consider legal land designation when interpreting agroforestry systems. In countries where agroforestry may occur within legally designated forest land, support any reclassification with additional evidence of historical agricultural designation and use. Account for fallow land in baseline refinement. Reclassify verified fallow areas as non-forest when they meet the methodology's fallow definition and remain within the allowable fallow period; treat long-abandoned areas that have reverted to forest as forest land.
7 Plot Data Preparation for Risk Assessment	

7.1 Buffers for Point Plots	Use buffer analysis for point-based plots to better characterize spatial uncertainty and support deforestation risk assessment. Apply a tiered buffer approach around point locations while ensuring that known polygon boundaries always take precedence over buffer-based approximations.
8 Deforestation Overlay Analysis	
8.1 Tree Cover Loss Detection	Optional/context-specific enhancement: Use near real-time deforestation alert systems to complement annual compliance assessments. Real-time alerts can support more timely monitoring, verification, and response to potential deforestation events but are not required under this methodology.
8.5.1 Point-Specific Buffer Analysis Procedure	Use a hierarchical attribution approach when assessing deforestation risk around point-based plots. Attribute deforestation events to the point with the strongest spatial evidence (0×, then 1×, then 2× buffers) while flagging neighboring points for additional monitoring or verification when attribution remains uncertain.
9 Legal Zoning Analysis	
9.1 Quality and Use of Legal Zoning Data	Use authoritative and well-documented legal zoning datasets. Prioritize official, up-to-date sources with clear documentation, and treat legal zoning layers as indicators of potential legal risk rather than automatic indicators of non-compliance, particularly where boundary accuracy or completeness is uncertain.
9.1.4 Verification of Farm Legal Status	Verify the legal status of plots overlapping protected or restricted areas. Review available evidence (e.g., permits, tenure rights, concessions, or government authorizations) to determine whether agricultural activity is legally authorized.
9.1.4 Verification of Farm Legal Status	Coordinate field verification with competent authorities when working in protected areas. Conduct field visits in accordance with applicable regulations and access requirements established by the institutions responsible for managing the area.
9.2 Point data near protected areas	Apply enhanced legal zoning checks to point-based plots near protected or restricted areas. Use buffered point analysis to identify potential overlaps, treat flagged cases as requiring further verification, and prioritize polygon collection to confirm legal status and boundary location.
10 Verification	
10 Verification	Use a graduated verification approach. Desk-based verification may support redirection of production to alternative market pipelines, while temporary or permanent exclusion of farmers from a supply chain should be based on field verification.
10.3 Verification Through Field Visits	Use field verification for complex or uncertain cases. Prioritize field visits when high-resolution imagery is unavailable or inconclusive, for complex land-use situations (e.g., fallow land or agroforestry), and before temporary or permanent exclusion of farmers from a supply chain.
11 Mitigation Protocol	
11.1 Plots verified as having a non-negligible risk of deforestation	Apply a proportionate mitigation protocol for plots verified as having a non-negligible risk of deforestation. Adapt corrective actions to the severity of the case, local context, and the operational and financial capacities of the actors involved.

	Redirect non-compliant production to alternative market pipelines. Reassess point-based plots after polygon collection and verification before determining final compliance status.
11.2 Corrective Actions for Plots Removed from the EU Market	Apply corrective actions proportionate to the scale and recurrence of deforestation. Consider both the cumulative extent of deforestation and any history of repeated non-compliance when determining responses. Develop corrective action plans jointly with producers and supply-chain partners. Actions may include improved mapping, training, no-deforestation commitments, restoration, and other preventive measures. Align restoration and remediation efforts with Accountability Framework Initiative (AFI) guidance. Design restoration activities that are proportionate, context-appropriate, and environmentally credible. Remap plots after restoration or boundary changes. Update plot geometries to prevent continued misclassification by future monitoring systems.
11.3 Management of Point Data with future risk of Non-Compliance	Prioritize polygon collection for point-based plots linked to potential deforestation. Use improved geolocation data to confirm compliance status before making long-term decisions.
11.4 Polygon Boundary Update and Maintenance	Use polygon buffers to support long-term boundary maintenance and risk management. Treat deforestation detected within polygon buffers primarily as a signal that plot boundaries may need updating rather than as direct evidence of non-compliance.

12.4 Annex 3 – Land Cover Data Catalog

Title	Type	Geographical scope	Land covers	Publisher	Link
Land Cover Map of Ivory Coast 2020	Official	Cote d'Ivoire	Cocoa, Forest, non forest natural lands	Bureau d'Études Techniques et de Développement	https://africageoportal.maps.arcgis.com/home/item.html?id=46348aa12a3d46e592584737de64f72a
The national land use map for Ghana	Official	Ghana	Cocoa, Forest, non forest natural lands	Forestry Commission	https://ghana-national-landuse.knust.ourecosystem.com/interface/
2020 Forest cover map of the cocoa growing regions of Ghana for EUDR	Official	Ghana	Forest	Forestry Commission	https://experience.arcgis.com/experience/757e84dd5ffe4490a860222c98853bac
Ecuador forest map 2020	Official	Ecuador	Forest	Ministerio de Ambiente y Energía	http://certificacionpuntoverde.ambiente.gob.ec/libraries/EAlfresco/?doc=workspace://SpacesStore/c8763c69-b7a5-4b65-900a-e5501bc1158c
Sistema de Monitoreo de las Coberturas de la Tierra	Official	Colombia	Forest	IDEAM - SIMCOT	https://storymaps.arcgis.com/stories/6b45024fb7a247219c33adc524345589
ETH high-resolution maps of cocoa	Research	Côte d'Ivoire, Ghana	Cocoa	Kalischek et al.	https://www.research-collection.ethz.ch/handle/20.500.11850/654400
Hansen Global Forest Change	Research	Global	Tree cover	Hansen et al.	https://storage.googleapis.com/earthenginepartners-hansen/GFC-2023-v1.11/download.html
Tropical Moist Forests product – Annual Change 2020	Research	Global	Tropical Moist Forests	Vancutsem et al	https://forobs.jrc.ec.europa.eu/TMF
JRC Global forest cover 2020 V3	Research	Global	Forest	Bourgoin et al	https://data.jrc.ec.europa.eu/dataset/8c561543-31df-4e1b-9994-e529afecaf54
ESA World Cover	Research	Global	Tree cover	Zanaga et al	https://esa-worldcover.org/en/data-access
GLAD Forest extent, 2020	Research	Global	Tree cover	Potapov et al	https://glad.umd.edu/dataset/GLCLUC2020
Global 30-meter Land Cover Change Dataset	Research	Global	Tree cover	Liu et al	https://gee-community-catalog.org/projects/glc_fcs/

Cocoa Probability model 2025a	Research	Global	Cocoa	Forest Data Partnership	https://developers.google.com/earth-engine/datasets/publisher/forestdatapartnership
Cocoa Probability model 2025b	Research	Global	Cocoa	Forest Data Partnership	https://developers.google.com/earth-engine/datasets/publisher/forestdatapartnership
Dynamic World	Research	Global	Tree cover	Brown et al	https://developers.google.com/earth-engine/datasets/catalog/GOOGLE_DYNAMICWORLD_V1
SBTN Natural Lands Map 2020 v1.1	Research	Global	Forest, non forest natural lands	Mazur et al	https://developers.google.com/earth-engine/datasets/catalog/WRI_SBTN_naturalLands_v1#description
Global Pasture Watch	Research	Global	Non forest natural lands	Parente et al	https://zenodo.org/records/11281157

12.5 Annex 4 – Protected Areas Data Catalog

Country	***Publisher***	***Link to repository***
Colombia	IDEAM - SIMCOT	https://runap.parquesnacionales.gov.co/
Ecuador	Ministerio de Ambiente y Energía	http://ide.ambiente.gob.ec/mapainteractivo/
Côte d'Ivoire	Bureau d'Études Techniques et de Développement	https://services8.arcgis.com/oTalEaSXAuyNT7xf/arcgis/rest/services/Habitat_humain_et_infrastructures_WFL1/FeatureServer