



CATCH in Practice:

Bridging Regulatory Intent and Operational Reality under Regulation (EU) 2023/2842

Convened under: EU Cluster of Food Traceability and Trust

Publication support: FoodGuard EU Horizon Project · ACT4FOOD Digital Europe Project

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Release Date:

June 2026

DISCLAIMER

This is a constructive contribution from the EU Cluster of Food Traceability and Trust. It translates operational experience from Seafood Europe issue tracking, operator experience, standards input and academic review. Its purpose is to make actionable recommendations towards the improvement of Regulation (EU) 2023/2842. *Publication support:* This whitepaper was prepared by the EU Cluster of Food Traceability and Trust Multidisciplinary Task Force, with publication and dissemination support from FoodGuard EU Horizon Project and ACT4FOOD Digital Europe Project. *Acknowledgment:* FoodGuard and ACT4FOOD are funded by the European Union. Views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union or the European Cybersecurity Industrial, Technology and Research Competence Center. Neither the European Union nor the granting authority can be held responsible for them.

Executive Summary

Central Thesis

Digital submission does not equal interoperability. The January 2026 CATCH mandate is a critical inflection point. The real opportunity lies in translating regulatory intent into practical digital infrastructure, building on what the Commission has already accomplished and identifying the concrete tools and mechanisms still needed to make the system work across governments, commercial operators, and global seafood supply chains.

From 10 January 2026, EU importers are required to submit catch certificates and related IUU documentation electronically via the CATCH module within TRACES NT, established by Articles 12a–12e of Regulation (EC) No 1005/2008 as inserted by Regulation (EU) 2023/2842. The Commission has made meaningful progress: Implementing Regulation (EU) 2025/1522 (July 2025) has harmonized port inspection benchmarks and updated certificate templates for CATCH compatibility. Implementing Regulation (EU) 2025/2196 (October 2025) has established detailed digital recording and reporting rules. These are significant steps towards digital traceability and electronic data.

The Commission has also published, in April 2026, a document titled ‘Interoperability and access to CATCH,’ which was updated on June 4th 2026, confirming that four countries, the Faroe Islands, Norway, Greenland, and Iceland, have established interoperability with CATCH for catch certificates and processing statements, and that the United Kingdom and New Zealand have done so for catch certificates. Eight further countries have been granted direct system access. It is worth noticing that on June 3rd 2026, the Commission also published guidance on completing weight information in catch certificates, processing statements, and importer declarations. We welcome these developments and ask the Commission for greater transparency about the technical scope, data coverage, and governance of the existing connections, and for an equivalent pathway for the much larger group of exporting nations and commercial systems.

In concrete terms, the gap is practical rather than conceptual: operators need a data dictionary, supported message formats, sample payloads, validation rules, error codes, access roles, versioning policy and conformance tests. Without these, CATCH will depend on manual transcription and case-by-case interpretation, while digital traceability across the supply chain will not be feasible.

A critical scope distinction is maintained throughout our work: CATCH is primarily an IUU import-control instrument. Article 58 of the amended Control Regulation creates broader obligations for supply-chain traceability, but those obligations sit with operators and are not exclusively fulfilled through CATCH. Therefore, we position CATCH as an import-control hub designed to interoperate with, rather than replace, the wider traceability ecosystem.

We make five recommendations below. Three can be delivered directly through Article 12c implementing powers; the remaining two require interpretive guidance, system development, and a medium-term roadmap:

- Publish operator-facing and connector-facing implementation artefacts for CATCH under Article 12c.
- Adopt binding technical definitions or interpretive guidance for key operational terms, as appropriate.
- Establish a Critical Tracking Event and Key Data Element framework as the basis for CATCH data requirements, aligned with internationally recognised implementation-compatible reference standards.
- Create a governed, tiered access framework for CATCH integrations, with clear governance and security parameters.
- Publish practical implementation guidance for SMEs, brokers, artisanal fisheries, and processing operators, and begin preparatory work for the 2028 EU Single Window connection.

We offer this paper as a constructive contribution from practitioners and researchers to the Commission's implementation process.

Regulatory Intent and CATCH Architecture

1.1 The Regulatory Framework

The CATCH module, within TRACES NT, is the electronic information management system established by Articles 12a–12e of Regulation (EC) No 1005/2008, as inserted by Regulation (EU) 2023/2842 (the EU Fisheries Control Regulation). From 10 January 2026, EU importers are required to submit catch certificates and related IUU documentation electronically via CATCH. Catch certificates validated before 10 January 2026 under the legacy paper-based regime may continue to be used in import procedures until 10 January 2028, creating a managed two-year transitional overlap.

Two principal instruments are amended in parallel by Regulation (EU) 2023/2842: Regulation (EC) No 1224/2009 (the Control Regulation), governing fishing activity, logbooks, landing declarations, sales notes, and traceability; and Regulation (EC) No 1005/2008 (the IUU Regulation), governing the catch certificate scheme and import controls for fishery products entering the EU from third countries.

Important Scope Note

CATCH is an IUU import-control instrument. It is not, and is not intended to be, the master system for all end-to-end seafood traceability within the EU. Article 58 of the amended Control Regulation places broader supply-chain traceability obligations on operators. Those obligations are complementary to CATCH but are not fulfilled exclusively through it. This distinction matters for the framing of interoperability requirements: we are asking CATCH to interoperate with the broader traceability ecosystem, not to replace it.

1.2 What the Key Articles Mandate

Article / Provision	Operative Requirement
Art. 12a (IUU Reg., as amended)	Establishes CATCH as the electronic information management system for catch certificate submissions and related documentation.
Art. 12b(1)	Defines CATCH functional requirements: electronic submission, quantity management mechanism, connection to EU Single Window (by 10 January 2028), electronic risk management and analysis.
Art. 12b(2)	Permits (not requires) CATCH to “interoperate with other systems relevant for the fight against IUU fishing, including through an interface with existing and functioning national IT systems.” Permissive language; no defined framework.

Art. 12c	Empowers Commission implementing acts defining the electronic data exchange mechanism, applicable standards, message structures, access conditions, data dictionaries, exchange protocols, and procedures. This is the primary legal vehicle for interoperability specifications.
Art. 12d	Mandatory CATCH use from 10 January 2026.
Art. 14 (IUU Reg.)	Requires a statement from processing plants endorsed by competent authorities for processed products, the structural link between catch certificates and processed-product import documentation. Template standardised by Delegated Regulation (EU) 2025/453.
Art. 16(1) (IUU Reg.)	Risk-management basis for competent authority checks. Risk criteria established in Regulation (EC) No 1010/2009, Art. 31 (as amended by Implementing Regulation (EU) 2025/1522).
Art. 58 (Control Reg., as amended)	Digital traceability for all fishery and aquaculture product lots across the supply chain. Lot assigned before placing on the market. <u>Distinct from CATCH scope but complementary.</u>
Art. 9 (Control Reg., as amended)	VMS/AIS for all vessels, including vessels under 12m by 10 January 2028. Technical rules established by Delegated Regulation (EU) 2025/1766.

1.3 What the Commission Has Already Done

Significant preparatory work has already been completed by the Commission. The following measures provide the legal and procedural foundation:

Instrument	Key Contribution
Commission Implementing Regulation (EU) 2025/1522 (28 July 2025)	Harmonises port inspection benchmarks for CATCH; updates simplified catch certificate template for CATCH compatibility; updates RFMO catch documentation scheme list; establishes eligibility rules for small-vessel simplified certificates; terminates legacy administrative arrangements incompatible with CATCH data requirements.
Commission Implementing Regulation (EU) 2025/2196 (17 October 2025)	Detailed rules for digital recording and reporting under the Control Regulation (Art. 1224/2009), covering ERS, VMS data transmission, inspection protocols, and digital inspection reports. Applies from 10 January 2026.
Commission Delegated Regulation (EU) 2025/453 (18 December 2024)	Establishes the template for the non-manipulation / single transport document referred to in Article 14(1)(b)(ii) of the IUU Regulation, the processing plant statement required for processed-product imports.
Commission Delegated Regulation (EU) 2025/1766 (27 August 2025)	Detailed rules on VMS monitoring, AIS, and ERS failure procedures under the Control Regulation. Applies from 10 January 2026.

Commission Implementing Regulation (EU) 2025/274 (12 February 2025)	Harmonised recreational fisheries data collection system, establishing cross-border interoperability requirements for recreational catch reporting.
Interoperability and access to CATCH (9 April 2026)	Published document listing countries with established interoperability (Faroe Islands, Norway, Greenland, Iceland — catch certificates and processing statements; UK, New Zealand — catch certificates) and countries with direct system access (Papua New Guinea, Uruguay, Mauritius, Venezuela, Egypt, Seychelles).
UN/CEFACT semantic foundation	CATCH leverages UN/CEFACT semantic modelling principles to structure catch certification information, providing a common and internationally recognized foundation for digital data exchange between operators and authorities.

Despite these advancements, the Commission has itself acknowledged in the FAQ (Q42b) that interoperability between CATCH and operator IT systems, ERP, WMS, customs broker platforms, and commercial traceability software “is not available for the time being” and “can be considered in the future.” This is the central gap this whitepaper addresses.

These instruments collectively establish the procedural, documentary, and data-field foundation for CATCH. Our focus is the operator-facing and connector-facing implementation tools that are crucial for translating these regulations into a practical integration architecture for importers, brokers, third-country authorities, and commercial systems.

1.4 The Commission’s Own Assessment

The Commission has itself noted that CATCH “has a potential to become a reference point as a digital environment for catch documentation schemes and international trade flows of fishery products thanks to its web-based approach and considerable interoperability opportunities.” We aim to help realize precisely that potential.

1.5 The Digital Transition Timeline

Instrument	Key Digital Requirement	Applicable From
Reg. (EU) 2023/2842 / IUU Reg.	Mandatory CATCH submission for catch certificates and IUU documents	10 January 2026
Control Reg. (as amended)	Electronic logbooks (Art. 14); landing declarations (Art. 23); sales notes (Art. 62)	10 January 2026
Impl. Reg. (EU) 2025/1522	Harmonised port inspection benchmarks; updated CATCH-compatible certificate templates	10 January 2026
Impl. Reg. (EU) 2025/2196	Detailed ERS/VMS digital reporting rules under 1224/2009	10 January 2026

Del. Reg. (EU) 2025/453	Standardised processing plant statement template (Art. 14 IUU Reg.)	10 January 2026
Control Reg. (as amended)	VMS/AIS for vessels under 12m; remote electronic monitoring	10 January 2028
IUU Reg. (Art. 12b(1)(c))	CATCH connection to EU Single Window for Member State and customs authorities	10 January 2028
Control Reg. (Art. 58)	Traceability for prepared/preserved fishery products and algae	10 January 2029

Current Operational Reality

2.1 How Catch Documentation Currently Flows

Across the majority of third-country trade relationships, catch documentation continues to flow as paper or PDF. The mandate has changed the submission endpoint, not the upstream process. The dominant formats encountered in practice are:

- Physical paper certificates with wet signatures;
- Scanned copies of paper certificates transmitted by email;
- PDF exports from national authority systems — including Canada (FCS), UK (IPAFFS), Norway (Fiskeridirektoratet), India (MPEDA), Ecuador (AUNAP/SIEP), and others, that are not structurally aligned with CATCH data fields;
- Outputs from bilateral electronic systems using country-specific schemas not mapped to CATCH requirements.

2.2 The Question of ‘Interoperability’ with Nordic and North Atlantic Nations

The Commission’s document ‘Interoperability and access to CATCH’ (9 April 2026) and its updated version (4 June 2026) list the Faroe Islands, Norway, Greenland, and Iceland as having established interoperability for catch certificates and processing statements and the United Kingdom and New Zealand for catch certificates. This is significant and welcome progress.

However, the document does not define what ‘interoperability’ technically means in this context. Specifically, the following questions remain unanswered in any publicly available source and are put to the Commission:

- Is the connection implemented through webservice API calls that transmit structured data automatically, or does it require manual triggering by an operator in the third-country system?
- Are all mandatory CATCH data fields, including vessel-level quantities, fishing trip IDs, gear types, FAO sub-areas, and captain/master details, transmitted in the data exchange, or are some fields still entered manually by EU importers?
- Are CTEs beyond the catch certificate, specifically the processing statement (Annex IV), transmitted through the same webservice mechanism, or only the catch certificate?
- What semantic mapping exists between each country’s national data model and the CATCH/UN/CEFACT data model? Is there a published crosswalk or equivalence table?
- What governance framework applies to these webservice connections? Are they governed by formal bilateral agreements, technical memoranda of understanding, or informal arrangements?
- Can a consignment originating from an interoperable third-country system be processed by EU importers entirely without manual re-entry, or is supplementary data entry still required?

Seafood Europe, as will be expanded in section 2.4, has compiled a CATCH register of issues (ANNEX B) that illustrate precisely why these questions matter: Industry evidence reviewed by the task force indicates that Norwegian catch certificate workflows may not provide every vessel-level data element in the form expected by CATCH and that Greenland has experienced intermittent operational availability. These examples should be presented as stakeholder-reported evidence requiring confirmation with the Commission and relevant competent authorities. They reinforce the need for country-specific descriptions of connection scope, field coverage, fallback procedures, and any residual manual completion.

Proposed Commission Action: Transparency on Existing Interoperability

The Commission should publish, for each country listed in the Interoperability and access to CATCH document, a brief technical description covering: (a) the connection mechanism (webservice / direct portal use / other); (b) which CATCH documents and data fields are covered; (c) which fields, if any, still require manual completion by EU importers; and (d) the governance framework applicable to the connection. This transparency will provide significant value to operators planning their compliance workflows, at no cost.

2.3 The Manual Re-Entry Problem

In the most common current workflow, an EU importer, customs broker, or agent receives documentation from a third-country exporter and manually transcribes the relevant data fields into CATCH and then has to repeat the process on their own system to maintain product traceability and provide associated information to retail etc. This creates a structural gap between the regulatory intent (electronic submission) and the operational reality (digitised paper re-entry). The result is a system that achieves the form of digital compliance without the substance.

The Structural Gap

Third-country certificate → Email/PDF to EU importer or broker → Manual re-entry into CATCH → Submission → Manual re-entry into commercial system. The certificate is 'digital' in the sense that it arrives in CATCH. It is not digital in any operationally meaningful sense: no data has flowed; it has been typed or copied.

Risk Category	Operational Manifestation
High cost-to-comply	Manual re-entry requires skilled staff time. Cost is disproportionately borne by SME importers without dedicated compliance teams.
Duplicated data entry	Identical data is entered multiple times: in the third-country authority system, in the exporter's documentation, in the importer's ERP / Traceability System, and again in CATCH. Seafood Europe issue register (Issue CATCH-21) confirms this persists even within CATCH itself.
Clearance delays	Manual entry queues and CATCH validation failures create delays at the border, with acute consequences for chilled and fresh product shipments.

Higher error rates	Transcription errors in vessel identifiers, species codes, FAO areas, and quantities are operationally common. Issues CATCH-13 and CATCH-14 confirm that master data gaps force operators into workarounds.
Inconsistent Member State interpretation	Without harmonised validation rules, identical submissions may be accepted at one port and queried at another. Seafood Europe issue register (Issue CATCH-18) documents active Member State divergence.
SME inequality	Large operators can invest in bespoke compliance infrastructure. SMEs cannot. The current approach structurally disadvantages smaller operators. To illustrate the scale of the manual re-entry challenge: a single export consignment of frozen sockeye salmon loaded into 22 refrigerated containers involved product collected through 44 tender vessels from 454 fishing vessels and supported by 2,970 official fish-ticket records. The current CATCH system's practical limit of approximately 26 vessels per certificate illustrates the mismatch between the system's capacity and the operational reality of supply chains involving more than 600 vessels. The challenge is not the absence of traceability information, it exists at high granularity at the source, but the practical impossibility of reproducing vessel-level and ticket-level data manually within CATCH's shipment-level workflows.



Image 1: Physical documentation requiring manual entry into CATCH for three consignments from a Peruvian squid exporter. Source: Seafood Europe, used with permission. Shown here as illustrative evidence of the physical scale of manual transcription described in this section.

2.4 Evidence from the Seafood Europe Industry Issue Register

Within the first two weeks of CATCH going live on 10 January 2026, Seafood Europe, the representative organization for European seafood processors, compiled an industry issue register documenting 27 distinct operational challenges encountered in early live use.

This section does not present the register as a definitive inventory of current CATCH failures. Some issues may have been addressed through system updates or guidance clarifications in the months since January 2026. Rather, the register is treated as structured early evidence of the systemic design and governance gaps that CATCH's architecture created at launch.

The issues cluster into four categories, each pointing to a specific class of Commission action.

Cluster A: Data Quality and Master Data Gaps

The largest and most operationally immediate category concerns CATCH's reference data layer: species codes, FAO codes, vessel registries, and operator address records. Argentina silus (silver smelt, FAO code ARU, CN 03049999) was absent from the species database, blocking imports outright. Several FAO codes were missing, forcing incorrect product declarations. Operators were required to register vessels not yet present in the CATCH vessel registry. Address duplication restrictions prevented re-registration of operators with updated addresses. Valid postal codes for key ports, including Bergen, Norway, could not be selected in the system.

Some of these observations may have reflected launch-period conditions and may subsequently have been corrected. Persistent gaps in species, gear, vessel, or operator reference data would justify publication of maintained code lists, crosswalks, ownership rules, and change-control procedures. For example, the Norwegian postal code and vessel data issues are particularly significant given that Norway is simultaneously listed as an 'interoperable' country, suggesting that interoperability has not resolved data completeness problems at the field level.

In addition, CATCH requires fishing gear selection using ISSCFG 2016 abbreviations (e.g., "TM" for midwater trawl), which are not fully aligned with the gear categories defined under Regulation (EU) No 1379/2013 on the common organisation of the markets in fishery and aquaculture products. This creates gear terminology in catch certificates that is not explicitly recognised under the EU legal framework, generating legal ambiguity and potential downstream labelling and compliance issues for operators using catch certificate data in EU market documentation. This issue should be explicitly addressed in the Article 12c data dictionary, with a published crosswalk between CATCH gear codes and Regulation 1379/2013 gear categories.

Cluster B: System Functionality and Workflow Design

A second cluster documents issues in CATCH's own workflow design. Information entered in catch certificate may not be automatically carried over to subsequent workflow steps, processing statements, and importer declarations, hence requiring re-entry of data already in the system, contradicting the Commission FAQ's description of automatic data transfer. The system did not reliably notify users when competent authorities added comments or requests for additional information, causing operators to miss deadlines. Search functionality incompatibilities produced the contradictory situation of a certificate that could not be found by search but was flagged as a duplicate on creation. It's worth noting that performance degraded significantly with multiple vessels, up to five minutes per refresh for large consignments.

Some of these issues, particularly search inconsistencies and notification failures, are plausibly resolvable through software updates and may have been addressed since January 2026. The data carry-over gap (CATCH-21) and performance degradation at scale (CATCH-26) are more structural and should be confirmed as resolved before the Commission can claim a fully functional digital workflow.

Cluster C: Interoperability and Cross-System Coherence

A third cluster documents and raises concerns regarding the connectivity or boundaries between CATCH and other systems: between CATCH and TRACES NT, between CATCH and customs systems, and between CATCH instances in different Member States. TRACES NT required prior IUU/CATCH data to be present before allowing import workflow progression, creating technical blockages unrelated to substantive compliance. Customs systems could not record CATCH certificate numbers within TRACES, requiring workarounds. Spanish TRACES-issued catch certificates for products from Spanish vessels arriving from third countries could not be linked to CATCH.

These cross-system failures are important because they partly undermine the Commission's own argument that CATCH provides a 'centralised digital management environment' for IUU certification. If data does not flow coherently between CATCH, TRACES NT, and customs systems within the EU, the integrity of the quantity management mechanism, the central anti-fraud function of CATCH under Article 12b(1), may be compromised.

Cluster D: Legal Interpretation, Governance, and Member State Divergence

The fourth and most structurally significant cluster concerns legal interpretation inconsistencies and governance failures. Some operators were asked for catch certificates for intra-EU trade, despite the regulation applying only to third-country imports. The system interpreted Annex I incorrectly for Argentina silus, blocking permissible imports. One Member State (Netherlands) appeared to require CATCH-issued catch certificates for products exported to the UK, beyond what the regulation requires. It is also worth noting that Member States were developing divergent fixes to CATCH implementation problems without EU-level coordination.

Most significantly, Issue CATCH-23 documents a workflow deadlock: when a catch certificate enters 'pending modification' status, downstream operators cannot correct it, while the system prevents creation of a replacement certificate. This is a supply chain blockage with no documented resolution pathway, and it is structural in nature.

Legal interpretation and governance issues of this nature are unlikely to be resolved by software updates alone. They require interpretive guidance from the Commission, which is exactly what Recommendation 2 proposes, and harmonised validation rules across Member States, which Recommendation 1 addresses through the data dictionary and validation rule catalogue.

Key Observation: The Issue Register as Evidence

The Seafood Europe issue register was compiled within the first two weeks of live CATCH operation. It represents a snapshot of early implementation, not a permanent indictment of the system. Early operational evidence of this kind is standard in any major digital transition and does not, on its own, indicate systemic failure. What it does indicate, and what we argue, is that specific structural gaps in CATCH's design require deliberate Commission action to close: a published data dictionary, harmonised validation rules, a cross-system coherence interoperability framework, and interpretive guidance on legal scope.

2.5 The Broker and Intermediary Dimension

A significant proportion of CATCH submissions are made by customs brokers, freight forwarders, and trade agents acting on behalf of importers. This intermediary layer is operationally critical but underrepresented in policy discussions, partly because brokers regard their compliance workflows as proprietary service differentiators and are therefore reluctant to disclose operational pain points directly.

The evidence available through industry associations and processor consultations indicates that broker-mediated submissions are a primary vector for the manual re-entry problem. Brokers typically receive scanned or PDF certificates and enter the relevant fields into CATCH on behalf of their clients, performing a data-conversion function that structured interoperability would make unnecessary. Any interoperability framework that does not address the broker workflow will leave a significant share of submissions outside its scope.

2.6 Unintended Consequences of the Legislation: Fraud Risk and Regulatory Arbitrage

Regulation (EU) 2023/2842 is intended to strengthen controls against Illegal, Unreported and Unregulated (IUU) fishing and improve traceability. Yet, experience from other highly regulated food sectors suggests that increased compliance requirements can also create new incentives for fraud and regulatory arbitrage. Seafood fraud is already known to occur through a variety of ways¹ such as species substitution, false declarations of geographic origin, misrepresentation of production method, illegal transshipment, document falsification, quantity inflation, and the laundering of IUU-caught fish through complex processing and aggregation chains.

It is likely that the transition to mandatory electronic submission will reduce some forms of documentary fraud; however, it may simultaneously increase incentives to manipulate upstream data before entry into CATCH. Where data originates from paper certificates, PDFs, or national systems that are not fully interoperable with CATCH, inaccurate or deliberately falsified information may be digitised and thereby acquire a perception of legitimacy. The risk is particularly acute in multi-vessel aggregation, processing, and re-export supply chains where traceability links can be weak and deliberately obscured.

Differing levels of interoperability between exporting nations may also create opportunities for regulatory arbitrage, with trade potentially shifting towards jurisdictions where data verification is less rigorous or where digital controls remain weaker. In the absence of harmonised system

¹ <https://ift.onlinelibrary.wiley.com/doi/10.1111/1541-4337.12998>

interoperability, robust cross-system data verification, and risk-based analytics, there is a possibility that fraudulent operators will adapt their methods to exploit gaps between national systems rather than abandon their fraudulent activities.

Beyond document falsification and origin laundering, several less obvious fraud vectors deserve attention as rogue actors adapt to the new compliance system. The certificate-reuse problem is the one that could be worrisome for the Commission. Once a catch certificate is validated, the same certified volume could be claimed against more than one shipment as a consignment gets split, aggregated, processed, and re-exported across several jurisdictions, and unless mass-balance reconciliation is actually enforced, not just nominally required, at every Member State and third-country touchpoint, that gap stays open.

A few second order effects are worth flagging. Processing-country laundering becomes more attractive as harvesting-stage scrutiny tightens, fraudsters simply relocate to wherever the processing statement gets weaker verification. Jurisdiction shopping is the EU-internal version of the same logic: trade drifts toward whichever port or Member State is perceived to check least, which is already a known pattern in other trade-control systems. And wherever the system is genuinely hard to use correctly, a market in document-preparation "compliance" services tends to show up.

Cyber risk is the one nobody has really modelled yet. Once traceability lives in a digital record, the record itself becomes the target: database tampering, altered entries, identity theft of legitimate operators. That's a different threat model from everything else on this list, and it deserves its own dedicated assessment.

The most significant unintended consequence may be that fraud shifts from the physical product to the digital record. Historically, seafood fraud has often involved substituting fish, mislabelling species, or falsifying paper documents. Under a digitised regime, criminals may increasingly focus on creating apparently legitimate digital traceability records that conceal illegal activities. In such a scenario, a system may appear to be highly compliant while still containing fraudulent data. This reinforces the need for EU CATCH and Control Reg. (Art. 58) to evolve beyond document digitization towards a structured traceability and interoperability framework with clear definitions and standards, allowing for intelligence-led verification, anomaly detection, cross-system validation, and risk-based fraud analytics.

The Definitional Gap

Regulation (EU) 2023/2842 mandates digital records and electronic submission. It does not define what these terms mean with the technical specificity required for consistent and interoperable implementation. This section proposes practical definitions or interpretive frameworks for key operational terms. These may be adopted through binding technical definitions in implementing acts, binding legal definitions in delegated acts where the empowerment is clear, or interpretive guidance documents, as appropriate to the nature of each term and the available legal basis.

3.1 What is “Electronic”?

The regulation requires “electronic” submission and exchange. As currently used, the term encompasses materially different technical states that have very different operational and traceability implications:

Format Type	Assessment for CATCH Purposes
Scanned paper certificate (image PDF)	Does not constitute meaningful electronic submission. Not structured; not machine-readable; requires full manual re-entry.
PDF with unstructured text	Does not constitute meaningful electronic submission. Human-readable but not machine-processable without OCR, with no guarantee of data integrity.
Structured electronic form (CATCH portal entry)	Partial compliance. Data is captured in CATCH, but re-entry is still required from upstream documents.
Machine-readable JSON message	Substantive electronic exchange. Structured and machine-processable data that can be exchanged without manual transcription. However, interoperability depends on the use of common data definitions and standards.
API-based exchange	Full electronic exchange. Automated, governed, auditable data transfer between authorised systems.
EPCIS/GS1 event-based traceability record (JSON)	Full electronic exchange. A machine-readable, standards-based traceability record that provides a common semantic model for supply chain events, enabling interoperability, traceability, and linkage of lot identifiers across organisations and systems.

PROPOSED DEFINITION: “ELECTRONIC”	<i>“Electronic” means that required data exists in a structured, machine-readable and validated common semantic model for supply chain events capable of being exchanged, processed, re-used, and audited across</i>
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systems without manual transcription. The upload or submission of a scanned document or unstructured PDF does not constitute electronic submission for the purposes of the implementing acts under Article 12c.

3.2 What is “Immediate”?

Several provisions of the regulatory framework imply concepts of immediacy in data availability or transmission. Without operational definition, “immediate” is interpreted differently by authorities, importers, brokers, and technology systems. The ambiguity creates uneven compliance expectations across Member States and supply chain actors.

**PROPOSED
DEFINITION:
“IMMEDIATE”**

“Immediate” means that required data is available to an authorised party in the form and format needed to fulfil a regulatory obligation at the point in the supply chain where that obligation arises, without manual reconstruction or re-entry at the time of the request, without undue delay. Recommendation: Implementing acts under Article 12c should specify the applicable time window or SLA for each Critical Tracking Event and each category of authorised party.

3.3 What is “Interoperable”?

Article 12b(2) uses the term “interoperate” once, in a permissive and undefined form. No definition of interoperability is provided anywhere in the regulatory text. The concept must be understood at multiple levels, drawing on established EU policy frameworks and extending them to cover the commercial system dimension.

The European Interoperability Framework (EIF, COM(2017)134), now given statutory form through the Interoperable Europe Act (Regulation (EU) 2024/903), defines four interoperability layers for public sector systems: legal, organisational, semantic, and technical. These cover all government-to-government (A2A) and government-to-business (A2B) interactions relevant to CATCH.

Neither the EIF nor the Interoperable Europe Act were designed to govern business-to-business interoperability between private operators, which constitutes the majority of exchanges towards end-to-end traceability: the data exchange between ERP systems, traceability platforms, customs broker software, and CATCH. This commercial dimension requires a fifth level, grounded in the EU Data Act (Regulation (EU) 2023/2854, applicable from 12 September 2025), which establishes the legal framework for B2B data access and the Commission’s power to mandate interoperability standards for data space participants.

Level	Scope and Definition	Policy Grounding
1. Legal	Common interpretation of CATCH obligations across all 27 Member States. Harmonised	EIF / Interoperable Europe Act (Reg. (EU) 2024/903) — A2A

	validation rules. No fragmentation by port of entry.	and A2B scope. Art. 12c implementing acts.
2. Organisational	Aligned workflows between competent authorities, importers, brokers, and third-country systems. Defined roles, responsibilities, and authorisations within CATCH.	EIF / Interoperable Europe Act. Guidance documents under Art. 12c.
3. Semantic	Shared meaning of all data fields, code lists, species identifiers, vessel identifiers, certificate statuses, and product descriptions. Single EU data dictionary for CATCH. No translation ambiguity.	EIF / Interoperable Europe Act. Art. 12c data dictionary mandate. To be grounded in ETSI TC Data standardisation work under JTC 25.
4. Technical	Published API specifications, message formats (XML/JSON), authentication standards, sandbox environment, validation rules, versioning policy, change-management procedures, and error catalogues.	EIF / Interoperable Europe Act. Art. 12c implementing acts. CEN/CENELEC JTC 25 Trusted Data Transactions standards (in development; expected 2027).
5. Commercial System	Ability for authorised ERP, WMS, traceability platforms, customs broker systems, and certified connectors to exchange data with CATCH through governed, documented mechanisms. This layer is outside EIF scope and requires the EU Data Act framework.	EU Data Act (Reg. (EU) 2023/2854), applicable 12 September 2025. IDSA Dataspace Protocol (submitted for ISO/IEC PAS standardisation, December 2025). Gaia-X Trust Framework (European industry-led initiative; not a legally binding EU instrument). Seafood domain interoperability framework: does not yet exist.

Important Nuances on Level 5

The EU Data Act covers B2B data access and establishes the Commission's power to mandate interoperability standards for data spaces. However, no seafood-specific domain interoperability framework (DIF) currently exists under these instruments. The IDSA Dataspace Protocol and Gaia-X Trust Framework are important industry-led technical standards, but Gaia-X is not a legally binding EU regulatory instrument. Level 5 interoperability for CATCH should be presented as a medium-term objective (2027–2028), not a prerequisite for 2026 compliance.

Observation: The strategic goal of end-to-end traceability and transparency as stated in Art. 58 of the control regulation can only be achieved if all above levels are implemented and maintained.

PROPOSED DEFINITION: "INTEROPERABLE"

"Interoperable" means the ability of authorised public and commercial systems to exchange, interpret, validate, and re-use required traceability and catch-certificate data through governed, documented, secure, and standardised mechanisms, without unnecessary manual re-entry or loss of data meaning, and where the conformance of such mechanisms is verifiable through published standards, testing environments, and certification procedures accessible to authorised market participants.

3.4 What is “end-to-end”?

End-to-end traceability is implicit throughout the regulatory framework but not explicitly defined. For CATCH purposes, end-to-end traceability must cover all Critical Tracking Events from catching or harvesting to retail stage (as referenced in Art. 58 of the control regulation). The obligation to maintain traceability beyond that point, through processing and distribution, falls under Article 58 of the Control Regulation and rests with operators.

PROPOSED DEFINITION: “END- TO-END” TRACEABILITY

“End-to-end” traceability means the preservation of structured, machine-readable data linkages across all Critical Tracking Events from point of catch to the EU import control point and then to retail stage, with preserved links between lots, certificates, operators, locations, and product transformations. A traceability chain that requires manual reconstruction to be traversed does not meet this requirement.

Note

For CATCH purposes, ‘end-to-end’ continuity means preserving links between relevant catch, certificate, processing, transport, importer-declaration, and import-control data from origin to the EU import decision. Traceability after import through EU distribution and retail is governed principally by the applicable Control Regulation traceability obligations and operator systems. The two layers should interoperate, but CATCH should not be presented as the sole system responsible for downstream Article 58 compliance.

3.5 What is a “Lot”?

Article 4(20) of Regulation (EC) No 1005/2008 defines a lot by reference to species, geographic area, vessel, and presentation. This definition is operationally insufficient for supply chains that routinely involve aggregation, splitting, transformation, and re-export. Rather than seeking to replace the legal definition, which would require legislative action, we propose a complementary “lot identity and transformation data model” that gives practical effect to the legal concept across the supply chain.

PROPOSED: LOT IDENTITY AND TRANSFORMATION

A lot is a defined quantity of fishery or aquaculture product that shares a common traceability identity, linked to one or more origin events, operators, locations, time periods, and product characteristics, and whose identity is preserved or transformed through subsequent supply-chain events. The lot identifier must be assigned at first landing and propagated forward through all subsequent CTEs. Aggregation and transformation are recognised as legitimate lot-transforming events, each constituting a Critical Tracking Event requiring defined Key Data Elements. Transformation through commingling is not treated as a traceability vulnerability; it is treated as a defined event requiring quantity attribution logic, and a list of contributing vessels or production units.

3.6 What is an Aggregation event?

The lot identity and transformation model proposed in Section 3.5 requires the distinction between events that simply rearrange Lot grouping and events that fundamentally change the Lot. This section (Aggregation event) defines the first, lower-risk case, i.e., grouping distinct traceable lots into a larger logistical unit without altering their individual identity; Section 3.7 (Transformation event) defines the second.

PROPOSED: AGGREGATION EVENT

An Aggregation Event is a supply-chain event in which two or more distinct traceable lots are physically combined into a larger logistical unit for storage, handling, or transport. The constituent lot identities are preserved and remain independent. The event is reversible: constituent lots can be disaggregated without loss of traceability information. Seafood examples: palletisation of certified cartons; container consolidation where each lot's catch certificate reference is preserved.

3.7 What is a Transformation event?

In GS1/EPCIS terms, aggregation is reversible (distinct lots physically grouped, e.g. palletisation, that can be separated without loss of identity). Commingling or batch mixing is irreversible (pooling that destroys individual lot identities). First-mile seafood operators commonly use 'aggregation' to describe what GS1/EPCIS would term an irreversible transformation. This distinction matters for enforcement: reversible aggregation preserves individual lot identities and is lower risk; irreversible commingling destroys individual lot identities. Multi-vessel harvest pooling common in artisanal and pelagic fisheries, is an irreversible event and should be a Transformation event, very much similar to the permanent changes that occur during LOT processing.

PROPOSED: TRANSFORMATION EVENT

A Transformation Event is a supply-chain event in which the traceable identities of two or more input lots are permanently incorporated into one or more new output lots with a new traceable identity. The event is irreversible: original constituent identities do not persist in the output and must be preserved through documented input-to-output linkage. A transformation event changes a product's form, composition, or traceable identity and creates one or more output lots linked to documented input lots and quantities. Examples include filleting, cooking, freezing into a new production lot, canning, or commingling where constituent lot identities no longer remain independently recoverable (e.g., multi-vessel catch pooling through tender vessels; bulk landing of artisanal fleet combined into a single export batch).

Operational Interoperability Gaps

Beyond the definitional gap, a series of specific operational and technical gaps prevent CATCH from functioning as a genuinely interoperable system. Each gap is identified below, with the associated regulatory provision, a practical framing of the issue, and a recommended approach.

4.1 Operator-Facing Implementation Artefacts

Article 12c empowers the Commission to adopt implementing acts defining the data exchange mechanism, standards, message structures, access conditions, data dictionaries, protocols, and procedures. The urgent need is not for additional regulatory text but for the concrete implementation artefacts that translate those specifications into working tools. These include:

- A published CATCH data dictionary: field names, data types, code lists, mandatory/optional status, and alignment with Annex II of the amended IUU Regulation;
- Sample payloads for each certificate type (standard catch certificate, simplified certificate, re-export certificate, processing statement) in JSON format;
- A published validation rule catalogue: all rules applied by CATCH on submission, with rule identifiers, triggering conditions, and expected error responses;
- An error response catalogue: standardised error codes, descriptions, and guidance on resolution;
- A versioning and change-management policy: how CATCH specifications will evolve, with what notice, and how backwards compatibility will be managed.

Why This Matters

Without these artefacts, prospective integrators may need to infer CATCH behaviour through testing, bilateral exchanges, or manual mapping. Publishing them would reduce implementation uncertainty, although access, cybersecurity, data protection, liability, support capacity, and change governance remain legitimate policy and operational considerations.

Operator feedback gathered from Seafood Europe also points to an adjacent gap that the same publication effort could close. The completion guidance for catch certificates does not appear to have reliably reached third-country exporters and authorities, and an incorrectly completed certificate can block a file and delay certification regardless of whether the underlying catch is fully documented and lawful; the implementation artefacts proposed above should therefore be published in a form, and through channels, that reach third-country issuing authorities directly, not only EU-based importers and brokers.

4.2 Access Governance and the Connectivity Model

Article 12b permits CATCH to “provide for the possibility of exchanging information, data, and documents relevant for importation, re-exportation” with “with other authorities of the Member States and with the customs authorities of Member States through the EU Single Window”. This provision is permissive and does not define who may connect, under what conditions, or subject to what governance. No publicly available access framework currently exists.

Recognizing that opening CATCH to commercial system access is a necessary step for end-to-end traceability, we propose a tiered access model rather than a single universal API:

	Participants and Governance Approach
Tier A: Competent Authority Access	Competent authority systems already within the intended scope of Art. 12b. Access governed by formal bilateral or multilateral arrangements with the Commission. Full read/write access within their jurisdiction.
Tier B: EU Importer Direct Submission	EU importers submitting on their own account. Access via authenticated portal (existing) and, where implemented, via secured API. Governance through TRACES NT registration and EU importer accreditation.
Tier C: Authorised Agent / Broker Access	Customs brokers and agents acting under a documented power of attorney from an EU importer. Access scoped to submissions on behalf of accredited principals. Governance through broker registration and client-specific authorisation tokens.
Tier D: Certified System Connectors	Traceability platforms , ERP, WMS, and third-party software providers seeking programmatic integration. Access subject to conformance testing, published certification (ie GDST capable etc), signed data processing agreements, and security review. This tier should be developed as a medium-term objective with a published roadmap.

Sensitive Area: Commercial API Access

Tier D is the hardest ask and the most sensitive for the Commission. Opening CATCH to commercial system access raises governance, security, data protection, support burden, and liability questions. The recommendation is not to demand immediate open API access, but to ask the Commission to publish a roadmap and governance framework for Tier D access with a target date, so that commercial system developers can plan. A published ‘intent to certify’ has significant market value even before the certification framework is live.

4.3 Sandbox and Conformance Testing

Without a sandbox environment, sample payloads, and a validation rule catalogue, commercial system providers and third-country authority systems cannot develop, test, or verify CATCH integrations before the mandatory date. This is a fundamental barrier. The recommendation is for the Commission to establish:

- A CATCH sandbox environment accessible to all four tiers described above, with realistic but anonymised test scenarios;
- A published certification pathway for Tier D connectors, including conformance test suites, pass/fail criteria, and recertification requirements on specification change;
- A Member State test scenario library to support harmonised implementation across competent authorities.

4.4 Semantic Harmonisation and the Data Dictionary

Article 12c explicitly references “data dictionaries” as a subject for implementing acts. No published data dictionary currently exists for CATCH. The following code lists and identifier definitions require harmonised EU-level specifications to prevent semantic divergence across Member States and third-country systems:

- Species codes (FAO alpha-3, CN/HS codes, and the alignment between them);
- FAO fishing area and sub-area codes;
- Vessel identifiers (IMO number, UVI, flag state registration number) and their cross-reference rules;
- Product presentation and processing type codes;
- Certificate status values and lot status values;
- Transformation type codes and aggregation type codes.
- Gear type codes: A public cross reference that maps the FAO International Standard Statistical Classification of Fishing Gear (ISSCFG 2016) with the broader fishing gear categories defined in Annex III of Regulation (EU) No 1379/2013 for consumer information purposes, to prevent downstream labelling issues.
- Multiple processed product semantic gap: Multiple processed products derived from a single batch of raw material can be problematic in recording. For example, if 100 kg of fish sourced from a third country is processed into three separate products falling under three different tariff headings, ie 40 kg of fillets, 50 kg of steaks, and 10 kg of cheeks, the system will sum them into a hypothetical raw material input of 300kg. An explicit data model linking each output product to a shared input-lot reference (and proportion) would resolve this with.

4.5 Traceability Design: Multi-Vessel Supply Chains and the Vessel-Level Quantities Problem

Seafood Europe Issue Register documents (CATCH-19) a structural mismatch between CATCH’s data requirements and Norwegian catch certificate practice. CATCH field 3 requires vessel-level quantities and captain information. It is noteworthy that Norwegian catch certificates do not currently provide this data in CATCH-compatible format. This issue affects a country listed as ‘interoperable’ with CATCH, which means that interoperability at the connection level has not resolved the data completeness problem at the field level. In the Issue Register, CATCH-04 raises the same problem more broadly for any multi-vessel supply chain involving batch mixing. The CTE/KDE framework proposed in Section 5.2 directly addresses this by defining minimum KDEs at the individual vessel level within a Transformation / Aggregation lot structure.

Operators have reported that manually transcribing a single third-country certificate into CATCH can take anywhere from around fifty minutes to several hours, depending on the complexity of the underlying consignment, and that this is consistently described as a burden of repeated handling of already-documented information rather than a gap in the documentation itself.

4.6 Transformation and Artisanal Fisheries

Many supply chains, particularly in developing exporting nations, aggregate / transform catches from multiple small vessels before export. This is a legitimate and common practice, but the current framework does not explicitly recognise this transformation.

Sensitive Area: Transformation

Transformation is legitimate only when supported by defined Key Data Elements, including the list of contributing vessels and trip identifiers and quantity attribution logic

A related structural gap concerns the simplified catch certificate itself. The simplified certificate is currently available only to third countries, which means that intra-Union exports involving a non-EU destination cannot use it even where the underlying operational pattern is identical to the artisanal aggregation problem described above. Spanish small-scale octopus vessels exporting to the United Kingdom illustrate the point: with average landings of approximately 4 kg per fishing trip, a single 20-tonne container may require in the order of 5,000 individual catch certificates. This is not a third-country capacity gap; it is a gap in CATCH's own certificate framework, since the exact same catch would qualify for a simple catch certificate had the destination been a third country rather than the UK.

Recommendation

Extend simplified certificate eligibility to small-scale, low-volume EU exports regardless of destination to remove the asymmetry.

A separate question arises for the inverse case: a single small-scale vessel landing several distinct species from the same fishing trip, for example octopus, cuttlefish, and squid taken together in one haul.

Recommendation

CTE/KDE artefacts should be provided to specify if a single-vessel, multi-species trip should generate one fishing event record per species or one record carrying multiple species

4.7 Member State Consistency

Without harmonised validation rules published under Article 12c, identical CATCH submissions may be processed differently across Member States, accepted at one port and queried at another. The implementing acts should define a common validation rule set and a common error-handling protocol that apply uniformly across all competent authorities. Member States retain enforcement discretion; validation rules should not.

The implementation of CATCH has highlighted an **information-governance gap** between the European Commission, Member State authorities and economic operators. Operational clarifications, temporary arrangements and exemptions may be communicated by the Commission to national administrations, which are then expected to transmit the relevant information to businesses. While this approach reflects the respective institutional

responsibilities, it does not always ensure that information reaches all operators in a timely, consistent and easily verifiable manner. That is because businesses do need clear authoritative reference before changing procedures, instructing suppliers or signing contracts. Without it, they may be uncertain whether consignments will be accepted, exemptions apply, or specific documents are required, creating delays, planning disruptions and avoidable costs, or it may also affect commercial relationships with third-country suppliers. The current communication chain can also create unequal conditions across Member States, as authorities may share guidance at different times, through different channels and with varying levels of detail. This increases the risk of inconsistent interpretation and implementation.

Recommendation

A coordinated EU-level information mechanism would help address these concerns, providing a single point of reference for validated operational clarifications, exemptions and transitional arrangements. It should also clearly indicate legal or administrative status, scope, duration and conditions of application. Where full publication is not legally appropriate, a formal notice, reference number or harmonised summary could still provide operators with an authoritative and traceable basis for compliance and contractual purposes. This approach would not alter the division of responsibilities between the Commission and Member States. It would strengthen consistency, transparency and predictability. It would also support uniform implementation, timely compliance and a level playing field for economic operators throughout the Union.

05 — A FRAMEWORK FOR PRACTICAL INTEROPERABILITY

A Framework for Practical Interoperability

5.1 The Layered Interoperability Model

The interoperability framework outlined in Section 3.3 interprets the European Interoperability Framework (EIF) within the specific context of CATCH. The first four levels correspond directly to the legal, organisational, semantic, and technical interoperability layers recognised by the EIF and reinforced through the Interoperable Europe Act. A fifth layer, commercial system interoperability, extends beyond the public-sector focus of the EIF to address integration with the commercial systems that generate and manage seafood traceability information.

Interoperability is partly technical, but it fails in practice if legal duties, roles, data definitions and operating procedures do not line up. The sections below therefore separate legal, organisational, semantic, technical and commercial system issues.

5.1.1 Legal Interoperability

Within the CATCH context, the principal legal interoperability challenge is ensuring that obligations are interpreted consistently across all Member States. An importer should not encounter materially different requirements, validation outcomes, or evidentiary expectations depending on the Member State through which a product enters the Union. Achieving this objective requires harmonised implementing measures, common validation rules, and clear

interpretive guidance under Article 12c. Legal interoperability is therefore the mechanism that prevents regulatory fragmentation within a digitally connected system.

5.1.2 Organisational Interoperability

Organisational interoperability concerns the alignment of workflows and responsibilities among competent authorities, importers, customs brokers, exporters, processors, and third-country authorities. Even where legal obligations are harmonised, interoperability can fail if participants follow different operational procedures or maintain incompatible governance structures.

For CATCH, organisational interoperability requires clear definitions of user roles, permissions, authorisations, and responsibilities. It also requires mechanisms for coordinating changes across participating organisations as the system evolves.

5.1.3 Semantic Interoperability

Semantic interoperability ensures that every participant interprets exchanged information in the same way. This requires more than common terminology; it requires a shared and authoritative definition of every data element used within the system.

For CATCH, semantic interoperability should be achieved through a single EU data dictionary defining required data fields, permissible values, code lists, identifiers, statuses, and business terms. Species codes, vessel identifiers, product descriptions, processing activities, certificate statuses, and country codes should be interpreted identically regardless of the software platform or jurisdiction involved.

To the extent possible, this data dictionary should align with existing international standards and code lists that are already widely implemented in food and seafood supply chains, including GS1 EPCIS/CBV (ISO/IEC 1987 and ISO/IEC 19988) and relevant FAO reference lists such as ASFIS species codes, ISSCFG gear classifications, and country codes. Some of these references are already reflected in parts of the CATCH interface, but they are not consistently exposed through a single implementation-facing specification. A unified data dictionary would allow competent authorities, software providers, and industry IT systems to map local terminology and internal data structures to CATCH requirements in a consistent manner.

Different actors will continue to use different systems, languages, and operational terminology. The interoperability objective is not to eliminate that diversity; it is to ensure that local terms can be mapped to a common semantic model. This semantic layer provides the foundation for the event-based CTE/KDE framework discussed in Section 5.2.

On GDST/EPCIS: Implementation-Compatible Reference Standards

GDST/EPCIS and GS1 standards should be recognised as implementation-compatible reference standards for interoperable traceability. Compliance should not require use of a single prescribed technical pathway, but any alternative approach must demonstrate equivalence by supporting the same core data elements, event-based traceability logic, identifier structures, and machine-readable data exchange needed for systems to interoperate in practice.

5.1.4 Technical Interoperability

Technical interoperability requires the implementation artefacts necessary for independent systems to connect to CATCH reliably and consistently. At present, limited information has been

published regarding the technical specifications underpinning existing interoperability arrangements.

Practical interoperability requires publication of a complete implementation package, including:

- API specifications;
- JSON message schemas;
- Authentication and authorisation requirements;
- Validation rules;
- Error catalogues;
- Versioning policies;
- Change-management procedures;
- Sandbox environments; and
- Conformance testing mechanisms.

These artefacts are essential for software developers, national authorities, customs intermediaries, and commercial solution providers seeking to integrate with CATCH. Without them, data exchange remains dependent upon bilateral arrangements and manual data re-entry rather than repeatable implementation processes.

5.1.5 Commercial System Interoperability

The first four layers of the framework are derived from the EIF and primarily address interoperability among public-sector actors. However, seafood supply chains are dependent upon commercial software platforms that sit outside government interoperability models.

Traceability Solutions, enterprise resource planning (ERP) systems, warehouse management systems (WMS), customs brokerage platforms, and data exchange providers frequently generate and manage the information that ultimately is necessary for end-to-end traceability and CATCH submissions. Practical interoperability therefore requires mechanisms through which authorised commercial systems can exchange information with CATCH and subsequent transactions within the EU supply chain, using documented and governed interfaces.

In addition, enabling business-to-government (B2G) interface as foreseen under Article 3 of Regulation (EU) 2022/2399, would enable the immediate reduction of heavy manual data re-entry for CATCH, even before horizontal interoperability is achieved.

Commercial System Interoperability: Immediate Benefits

By enabling interoperability with available traceability systems, seafood FBOs will be able to leverage currently available software components for automatised text recognition from paper-based documents (OCR), automatised pre-filling of entry-fields and AI-based entry-field recognition. This would translate to businesses immediately benefiting and reducing their current data entry overhead associated with CATCH.

This layer falls largely outside the scope of the EIF and aligns more closely with the objectives of the EU Data Act and emerging European data-space initiatives. While not necessary for January 2026 compliance, it represents the logical next stage in the evolution of

CATCH from a regulatory platform to an interoperable component of the broader digital seafood ecosystem.

5.1.6 CATCH Within the Broader Seafood Data Ecosystem

CATCH should not be viewed as a standalone repository or comprehensive traceability platform. Its purpose is to support import-control requirements under the IUU Regulation. Many of the data elements required by CATCH originate elsewhere in the supply chain and are already captured within software solutions used by fishers, processors, importers, and exporters, among other supply chain actors.

Accordingly, interoperability should enable information to flow between authorised systems rather than requiring repeated data entry into CATCH. Data captured and validated once should be reusable for regulatory reporting and import-control purposes through standardised and governed exchange mechanisms.

Information may also flow directly between national authorities, customs systems, brokers, and commercial platforms. The diagram illustrates the principle that *CATCH should operate as an interoperable node within a broader ecosystem*.

Operating CATCH as an interoperable component of this ecosystem reduces duplication, improves data quality, lowers implementation costs, and creates a foundation for future integration with the EU Single Window Environment and broader European data-space initiatives.

5.2 The CTE/KDE Framework for Seafood Interoperability

Semantic end-to-end interoperability requires more than a shared vocabulary; it requires a common structure for organising information. Event-based traceability provides that structure.

Current catch certificate requirements are largely document-oriented. Software systems, however, operate most effectively when data requirements are organised around business events and the information associated with those events. Documents are outputs. Events are the underlying reality.

Business Event	Document OutPut
Harvest/Commissioning	Catch Certificate
Processing/Transformation	Processing Statement
Export/Shipping	Customs Declaration

A CTE/KDE framework does not replace regulatory documents. Rather, it provides a common implementation model through which those documents can be generated, exchanged, validated, and reused across systems.

Although CATCH is a seafood-specific regulatory system, the interoperability principles underpinning it are not seafood-specific. The EIF, the Interoperable Europe Act, and the broader EU digital governance architecture are designed to operate across sectors, commodities, and regulatory domains. For this reason, the CATCH interoperability model should be built around a commodity-agnostic event architecture wherever possible.

A commodity-agnostic approach offers several advantages:

1. Consistency with other traceability initiatives operating within Europe and internationally.
2. Lower implementation complexity for software providers supporting multiple commodities.
3. Reuse of common interoperability infrastructure across current and future regulatory systems, including the EU Single Window Environment for Customs.
4. Compatibility with real-world operators, logistics providers, customs intermediaries, and technology platforms that frequently handle multiple product categories rather than a single commodity.

This principle is increasingly reflected at other international regulatory practice and industry standards. The U.S. FDA's Food Safety Modernization Act (FSMA) Section 204 Food Traceability Rule uses a Critical Tracking Event / Key Data Element structure to define traceability requirements for high-risk foods. This provides international regulatory precedent that the CTE/KDE architecture is not a European theoretical construct but an approach independently validated by a major food safety regulator. Both the Global Dialogue on Seafood Traceability (GDST) and the Global Traceability Framework for Beef and Leather (GTFBL) as well as UNTP (UN Transparency Protocol) organise traceability requirements around common business events and associated data elements rather than commodity-specific document structures. Commodity-specific applications are mapped to a shared core event architecture, with additional sector-specific KDEs layered on top where necessary.

Accordingly, we propose that CATCH data requirements should be organised around a core set of interoperable business events that are applicable across commodity sectors, with seafood-specific requirements mapped to those events and additional CATCH-relevant KDEs layered onto that common framework.

5.2.1 Core CTEs

CTEs identify the points in a supply chain where traceability data must be captured. A small set of standardised event profiles is sufficient to describe most supply-chain movements and transformations across commodities.

Core CTE	Purpose	Seafood Examples
Commission	Creates or introduces a traceable object into the supply chain.	Catching (wild capture), hatching or larval rearing (aquaculture)
Ship	Transfers custody or possession to another actor or location.	Export shipment, transshipment, internal facility transfer
Receive	Records receipt of a shipment or transferred object.	Landing receipt, import receipt, transshipment receipt

Transform	Changes product form, composition, identity, or packaging.	On-vessel processing, land-based processing, repacking, commingling / batch mixing, farm harvest processing
Aggregate	Combines distinct traceable objects into a larger unit, where the constituent lot identities are preserved and remain independent.	Palletisation, master-carton assembly
Disaggregate	Separates previously aggregated objects into smaller units.	Pallet breakdown, carton breakdown
Decommission	Removes a traceable object from the supply chain.	Disposal, destruction, withdrawal

Under this model, seafood activities are represented as implementations of core event categories rather than as entirely separate event types. This preserves seafood-specific operational requirements while maintaining compatibility with broader interoperability frameworks.

5.2.2 Core KDEs

KDEs are the pieces of information captured at each CTE that make a product traceable through the supply chain. Rather than prescribing commodity-specific fields for every event, a common framework can organise KDEs into a small number of reusable categories.

KDE Type	Core KDEs
Product	Product ID, lot or batch identifier, description, classification, quantity
Event	Event ID, event date/time, business step, event type
Location	Location ID, location classification, location name, address, geolocation
Party	Party ID, Party Name

These core KDE categories are applicable across seafood (and other) supply chains and are recorded at each CTE as relevant to the event being performed. They provide a common structure for identifying what product was involved, what occurred, where it occurred, when it occurred, and who performed the activity. This common foundation supports semantic interoperability by ensuring that information is organised consistently across systems and sectors.

Commodity-specific KDEs are then layered onto this common structure and associated with the events where they are relevant. For seafood, these may include species identifiers, vessel

identifiers, fishing areas, gear types, catch certificate references, and authorisation data. For example, gear type is relevant to a fishing event but would not normally be recorded during processing or export activities. Similarly, catch certificate references may first be associated with specific harvest, landing, or export-related events before being carried forward through subsequent processes.

Organising KDEs in this manner also supports organisational interoperability. By associating data requirements with specific events, responsibility for data collection becomes clearer: the actor performing the event records the corresponding information. This provides a practical mechanism for allocating responsibilities across supply-chain participants while reducing duplication and uncertainty regarding data ownership and maintenance.

The GDST standard provides a practical example of this layered approach using underlying GS1/ISO standards. CATCH requires some data elements beyond the current GDST profile, but the overall structure and implementation approach can remain compatible.

06 — RECOMMENDATIONS TO THE COMMISSION

Recommendations to the European Commission

The following five recommendations are addressed to the European Commission and are mapped to the legal instruments through which each can be implemented. Implementing and delegated act powers already established by Regulation (EU) 2023/2842 and the existing Article 12c mandate should be adequate for their implementation. No new legislative action is required.

Recommendation 1 — Publish operator-facing and connector-facing implementation artefacts for CATCH

Under Article 12c, the Commission should publish the concrete implementation artefacts that operators, brokers, third-country authorities, and system providers need to integrate with CATCH: (a) a CATCH data dictionary aligned with Annex II of the amended IUU Regulation; (b) sample payloads for each certificate type in JSON format; (c) a validation rule catalogue with rule identifiers, triggering conditions, and error descriptions; (d) a standardised error response catalogue; (e) a role and access model defining who may interact with CATCH and in what capacity; and (f) a versioning and change-management policy. A stakeholder consultation draft should be published.

Recommendation 2 — Adopt binding technical definitions or interpretive guidance for key operational terms

The Commission should adopt binding technical definitions in implementing acts under Article 12c, or interpretive guidance documents as appropriate, for the following terms: ‘electronic’ (distinguishing structured machine-readable exchange from PDF/scanned submission); ‘immediate’; ‘interoperable’ (adopting the five-level framework proposed in Section 3.3); ‘end-to-end’ (defined within CATCH’s IUU import-control scope); and a “lot identity and transformation data model”, complementing the existing legal definition. Where the power to adopt binding definitions in delegated acts is not clearly available, interpretive guidance achieving the same operational clarity is an acceptable alternative.

Recommendation 3 — Establish a CTE/KDE framework and conformance testing environment

The Commission should map current CATCH data requirements to a proportionate CTE/KDE model and publish conformance scenarios for catch-certificate, processing, transport, and importer-declaration workflows. GDST/EPCIS and GS1 standards should be recognized as implementation-compatible reference standards for interoperable traceability. Compliance should not require use of a single prescribed technical pathway, but any alternative approach should demonstrate equivalence by supporting the same core data elements, event-based traceability logic, identifier structures, and machine-readable data exchange needed for systems to interoperate in practice. Any conformance environment should test semantic equivalence, quantity integrity, identifiers, security, and error handling.

Recommendation 4 — Publish a tiered access governance framework and roadmap

The Commission should publish a tiered access framework for CATCH connectivity (Tiers A–D as described in Section 4.2), including the governance conditions, authentication requirements, security standards, data protection obligations, and certification criteria applicable to each tier. For Tier D (commercial system connectors), an ‘intent to certify’ roadmap with a target date provides significant market value even before the certification framework is live. This approach acknowledges the legitimate security, liability, and governance concerns while creating a clear pathway for commercial integration.

A related but separate action is to establish a single, dated EU-level reference point for operational clarifications, exemptions, and transitional arrangements issued during the implementation of CATCH, so that operators and third-country suppliers across the Union can rely on one authoritative source rather than awaiting transmission through national channels of varying speed and detail.

Recommendation 5 — Publish practical implementation guidance and begin Single Window preparatory work

The Commission should publish practical, non-binding guidance for SMEs, brokers, multi-vessel and artisanal consignments, processing statements. The guidance should explain how each document type relates to CATCH data and quantity management and how it should be handled under the CTE/KDE framework. In parallel, the Commission should publish milestones for the required January 2028 EU Single Window connection, including data model alignment and testing.

Annexes

Annex A — Key Regulatory Provisions and Implementing Acts

Instrument	Key Content and EUR-Lex Reference
Regulation (EU) 2023/2842 (22 Nov. 2023)	Primary amending regulation. Inserts Arts. 12a–12e into IUU Reg. 1005/2008; amends Control Reg. 1224/2009. OJ L 2023/2842.
Art. 12a (amended IUU Reg.)	Establishes CATCH as the electronic information management system for catch certificates.
Art. 12b (amended IUU Reg.)	Defines CATCH functional requirements; permits (not requires) interoperability; mandates Single Window connection by 2028.
Art. 12c (amended IUU Reg.)	Empowers Commission implementing acts on data exchange, standards, message structures, access conditions, data dictionaries.
Art. 12d (amended IUU Reg.)	Mandatory CATCH use from 10 January 2026.
Art. 14 (amended IUU Reg.)	Processing plant statement requirement for processed-product imports.
Art. 16(1) (amended IUU Reg.)	Risk-management basis for competent authority checks.
Art. 58 (amended Control Reg.)	Digital traceability for all lots; lot assigned before placing on market.
Del. Reg. (EU) 2025/453 (18 Dec. 2024)	Template for Art. 14(1)(b)(ii) non-manipulation / transport document. OJ L 2025/453, 6.3.2025.
Impl. Reg. (EU) 2025/1522 (28 Jul. 2025)	Harmonised port inspection benchmarks; CATCH-compatible certificate templates; RFMO scheme list update; simplified certificate rules. OJ L 2025/1522, 29.7.2025.
Impl. Reg. (EU) 2025/2196 (17 Oct. 2025)	Detailed rules for ERS/VMS digital reporting under Control Regulation 1224/2009. Repeals Impl. Reg. (EU) No 404/2011.
Del. Reg. (EU) 2025/1766 (27 Aug. 2025)	VMS monitoring, AIS, and ERS failure procedures under Control Regulation.
Impl. Reg. (EU) 2025/274 (12 Feb. 2025)	Harmonised recreational fisheries catch data collection with cross-border interoperability requirements.

Annex B — Seafood Europe Industry Issue Register Summary

The following 27 issues were compiled by Seafood Europe and forwarded to the task force with permission (May 2026). Full details are available in the accompanying Excel register.

Issue ID	Category	Topic (abbreviated)
CATCH-01	Legal interpretation	CC requested incorrectly for intra-EU trade

CATCH-02	Legal interpretation	Incorrect Annex I interpretation for Argentina silus
CATCH-03	Traceability design	Unique fishing trip number undefined
CATCH-04	Traceability design	Multi-vessel batch mixing traceability
CATCH-05	IT functionality	Baltic mandatory fields failure (LT/LV/EE)
CATCH-06	IT functionality	No draft monitoring by authorities
CATCH-07	Traceability design	Automatic validation without human review
CATCH-08	Interoperability	Certificate not visible cross-MS until upload
CATCH-09	Interoperability	TRACES dependency blocking import workflow
CATCH-10	Interoperability	No CATCH/CC link for export customs
CATCH-11	Access / onboarding	EORI requirement unknown to third-country operators
CATCH-12	Preparedness	Low operator awareness in several countries
CATCH-13	Master data	Species missing (Argentina silus / ARU / CN 03049999)
CATCH-14	Master data	FAO codes missing from system
CATCH-15	Master data	Vessel registry gaps
CATCH-16	Master data	Address duplication restriction blocks re-registration
CATCH-17	Master data	ZIP code unavailable (Bergen NO 5020)
CATCH-18	Governance	Fragmented and divergent Member State implementation
CATCH-19	Traceability design	Norwegian CC vessel data mismatch (field 3)
CATCH-20	Legal interpretation	CATCH required for UK exports beyond legal obligation
CATCH-21	IT functionality	No automatic data carry-over between workflow steps
CATCH-22	IT functionality	No alerts for authority requests/comments
CATCH-23	Governance	Amendment locks downstream operators; no replacement pathway
CATCH-24	IT functionality	Search inconsistency: not found but flagged as duplicate
CATCH-25	IT functionality	No search by container number
CATCH-26	IT functionality	Performance degradation with multiple vessels
CATCH-27	Interoperability	Spanish TRACES certificates cannot link to CATCH

Annex C — Interoperability Policy Instruments

Instrument	Description and Relevance to CATCH
EIF (COM(2017)134, 23 March 2017)	European Interoperability Framework. Defines four interoperability layers (legal, organisational, semantic, technical) for public sector systems. Covers A2A and A2B interactions relevant to CATCH. Does not cover B2B commercial system interoperability.
Interoperable Europe Act (Reg. (EU) 2024/903, OJ L 2024/903, 22.3.2024)	Gives statutory form to EIF. Applicable from 12 July 2024. Scope: EU entities and public sector bodies. Mandates interoperability assessments; establishes Interoperable Europe Board to develop new EIF. Covers government-facing interoperability only.
EU Data Act (Reg. (EU) 2023/2854, OJ L 2023/2854, 22.12.2023)	Establishes harmonised rules for fair access to and use of data. Entered into force 11 January 2024; applicable from 12 September 2025. Covers B2C, B2B, and B2G data sharing. Art. 33 establishes essential requirements for data space interoperability. Legal foundation for Level 5 commercial system interoperability.
CEN/CENELEC JTC 25	Joint Technical Committee 25 on Data Management, Dataspaces, Cloud and Edge. Developing Trusted Data Transactions standards (Parts 1–3) under the Data Act Art. 33 mandate. Standards expected by end of 2027. When cited in OJEU, will create presumption of conformity with Data Act interoperability requirements.
IDSA Dataspace Protocol (DSP)	Technical protocol for sovereign inter-organisational data sharing, developed by IDSA, maintained by Eclipse Dataspace Working Group. Submitted for ISO/IEC PAS standardisation December 2025. Implementation-compatible reference standard for Level 5.
Gaia-X Trust Framework	European industry-led initiative providing trust, identity, and compliance verification mechanisms for data space participants. Not a legally binding EU instrument. ‘Danube’ release (2025) enables cross-ecosystem interoperability. Implementation-compatible reference for Level 5.
GDST / GS1 EPCIS (ISO/IEC 19987:2024)	Global Dialogue on Seafood Traceability standards; GS1 Electronic Product Code Information Services standard. Most widely adopted commercial implementation of CTE/KDE model in global seafood supply chains. Recognized as implementation-compatible reference standards

Annex D — Abbreviations

Term	Definition
AIS	Automatic Identification System
API	Application Programming Interface
CATCH	Catch And Traceability Control Hub (TRACES NT module)
CTE	Critical Tracking Event
DIF	Domain Interoperability Framework

DSP	Dataspace Protocol (IDSA/Eclipse)
EIF	European Interoperability Framework
EPCIS	Electronic Product Code Information Services (GS1)
ERP	Enterprise Resource Planning
GDST	Global Dialogue on Seafood Traceability
IDSA	International Data Spaces Association
IUU	Illegal, Unreported and Unregulated (fishing)
JTC 25	CEN/CENELEC Joint Technical Committee 25
KDE	Key Data Element
MPEDA	Marine Products Export Development Authority (India)
RFMO	Regional Fisheries Management Organisation
TRACES NT	Trade Control and Expert System (New Technology) — European Commission
UVI	Unique Vessel Identifier
VMS	Vessel Monitoring System
WMS	Warehouse Management System

Annex E — Evidence Base and Consultation Notes

Drafting coordinated by Agritrack SA on behalf of the task force with the whitepaper drawing on the following evidence sources. All industry evidence has been handled in accordance with the attribution preferences agreed with contributing organisations.

- Industry association evidence: Seafood Europe (Katarina Sipic) & German Association of Fish Processing and Fish Wholesale Industry - Bundesverband der deutschen Fischindustrie und des Fischgroßhandels e.V (Dr. Stefan Meyer & Dr. Fabian Schäfer);
- Technology evidence / Traceability Systems: Agritrack SA (Vlasis Tsezos, CEO; Panos Tsakanikas, CSO; George Skrimpas, CTO);
- Standards input: Institute of Food Technologists (IFT), Global Food Traceability Center (Dr. Blake Harris; Dr. Sara Bratager);
- Academic input: Thammasat University / Queen's University Belfast (Prof. Chris Elliott); University of Thessaly (Prof. Ioannis Boziaris; Assoc. Prof. Foteini Parlapani); Agricultural University of Athens (Assoc. Prof. Nikos Chorianopoulos); University of Coimbra (Dr. Sara Leston);
- EU Research Projects - **FoodGuard Horizon Project** — EU Horizon Europe research project on microbiome applications and food loss reduction & **ACT4FOOD Digital Europe Project** — EU Digital Programme project on cybersecurity for critical food supply chains
- Task Force consultation — EU Cluster of Food Traceability and Trust multidisciplinary working group (March–June 2026);
- Regulatory text — Regulation (EU) 2023/2842; Regulation (EC) No 1005/2008; Regulation (EC) No 1224/2009 as amended; all implementing and delegated acts cited in Annex A;

- Interoperability policy — EIF (COM(2017)134); Interoperable Europe Act (Regulation (EU) 2024/903); EU Data Act (Regulation (EU) 2023/2854);
- Standards — GDST 1.2 and 2.0 (forthcoming); GS1 EPCIS 2.0 (ISO/IEC 19987:2024); IDSA Dataspace Protocol; CEN/CENELEC JTC 25 work programme.

Annex F — Interoperability Maturity Model for CATCH

Not all participants in the CATCH ecosystem will achieve the same level of digital capability at the same time. Third-country authorities, supply chain actors, customs intermediaries, and software providers vary considerably in their technical capacity, resources, and existing digital infrastructure. As a result, interoperability should be viewed as a progressive process.

The objective of practical interoperability is therefore not to require all actors to achieve full system integration immediately. Rather, CATCH should support a range of implementation pathways that allow participants to advance gradually from manual processes toward increasingly automated and interoperable models.

Expressing CATCH requirements through a standardised event-based framework can further accelerate this progression. By expressing CATCH requirements in a manner that is compatible with internationally recognized, event-based traceability frameworks, stakeholders can leverage existing open-source software tools, reference implementations, and technical expertise rather than developing solutions from scratch, reducing implementation costs and lowering barriers to interoperability.

Table 3 outlines a proposed digital maturity model for CATCH. The model recognises that paper-based and manually entered submissions will remain necessary in some circumstances, particularly during the transition period. At the same time, it provides a roadmap toward fully interoperable, event-based information exchange in which data can flow directly between authorised commercial and regulatory systems with minimal manual intervention. Importantly, higher maturity levels build upon, rather than replace, the regulatory requirements that already exist within CATCH.

Table 3

Maturity Level	Description and Target Actors
Level 1: Paper / Scanned	Certificates exist as paper or image PDFs. Full manual re-entry into CATCH required. No data linkage. Current state for most third-country submissions.
Level 2: Structured Entry	Data entered directly into CATCH web portal by importer or broker. No upstream integration; re-entry still required from source documents. Current best practice for many EU operators.
Level 3: Semi-Automated	Third-country systems or commercial platforms generate structured outputs (XML/JSON) partially compatible with CATCH. Some manual field mapping remains. Near-term achievable target.
Level 4: Integrated	Third-country authority systems or commercial platforms connect to CATCH via documented API (Tier A/B/C). Structured data exchanged automatically. CATCH reference number linked to commercial lot ID. Target for 2027. Six countries (Faroe Islands, Norway, Greenland, Iceland, UK, New Zealand) have a webservice connection in place, but the field-level completeness of that connection is unconfirmed. As documented in Section 2.2, it is not yet publicly confirmed whether

	these connections cover all mandatory CATCH data fields or whether manual data completion by EU importers is still required for some fields.
Level 5: Fully Interoperable	End-to-end event-based traceability. EPCIS or equivalent events from commercial systems feed CATCH automatically. Certificate balance, quantity management, and risk management operate without manual intervention. Medium-term target.

EU Cluster of Food Traceability and Trust

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June 2026