Monitoring the marine ornamental fish trade to Europe with the European TRACES (TRade Control and Expert System) - An updated review from 2014-2021

Technical international workshop on the
trade of marine ornamental fishes
7-10 May 2024, Brisbane

Overview

- Team & Scientific Publications
- Trade
- TRACES

Ricardo Calado, PhD, University Aveiro, Portugal
Francisco Aguayo, economist, Universidad Nacional Autónoma de México
Monica Biondo, PhD, Fondation Franz Weber, Rainer Burki asdfg.IT

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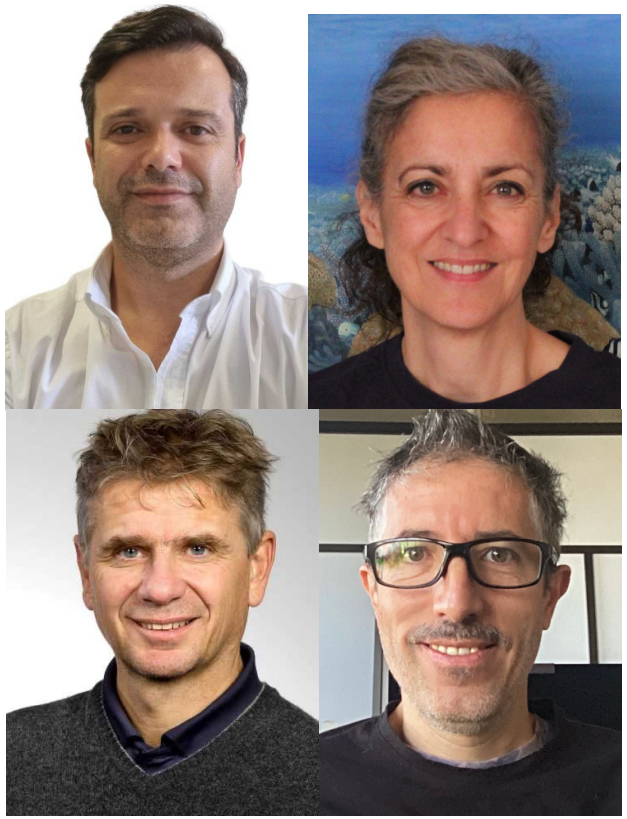
Who we are



- **Dr. Ricardo Calado**
  Working for **20+ years with marine ornamental species** Aquaculture, Biology and Conservation.
  PhD in 2005 in Biology, Faculty of Sciences of Lisbon University (FCUL)
  Principal Researcher, University of Aveiro, Portugal, Scientific Coordinator of **CEPAM-ECOMARE**
- **Dr. Monica V. Biondo**
  Started her **research on trade in marine ornamental fishes in Europe in 2010**
  PhD in 2019 in Biology, Faculty of Ecology & Evolution, University of Bern, Switzerland, on marine ornamental fish trade. **CITES since 1996.**
  Head of Research and Conservation at the **Fondation Franz Weber**
- **Rainer P. Burki**
  Computer science engineer, graduated from the Swiss Federal Institute of Technology Zurich, ETH
- **Francisco Aguayo**
  Economist at theFaculty of High Studies Cuautitlán at the National Autonomous University in Mexico City and is a member of the World Economics Association, **economics on wildlife trade**

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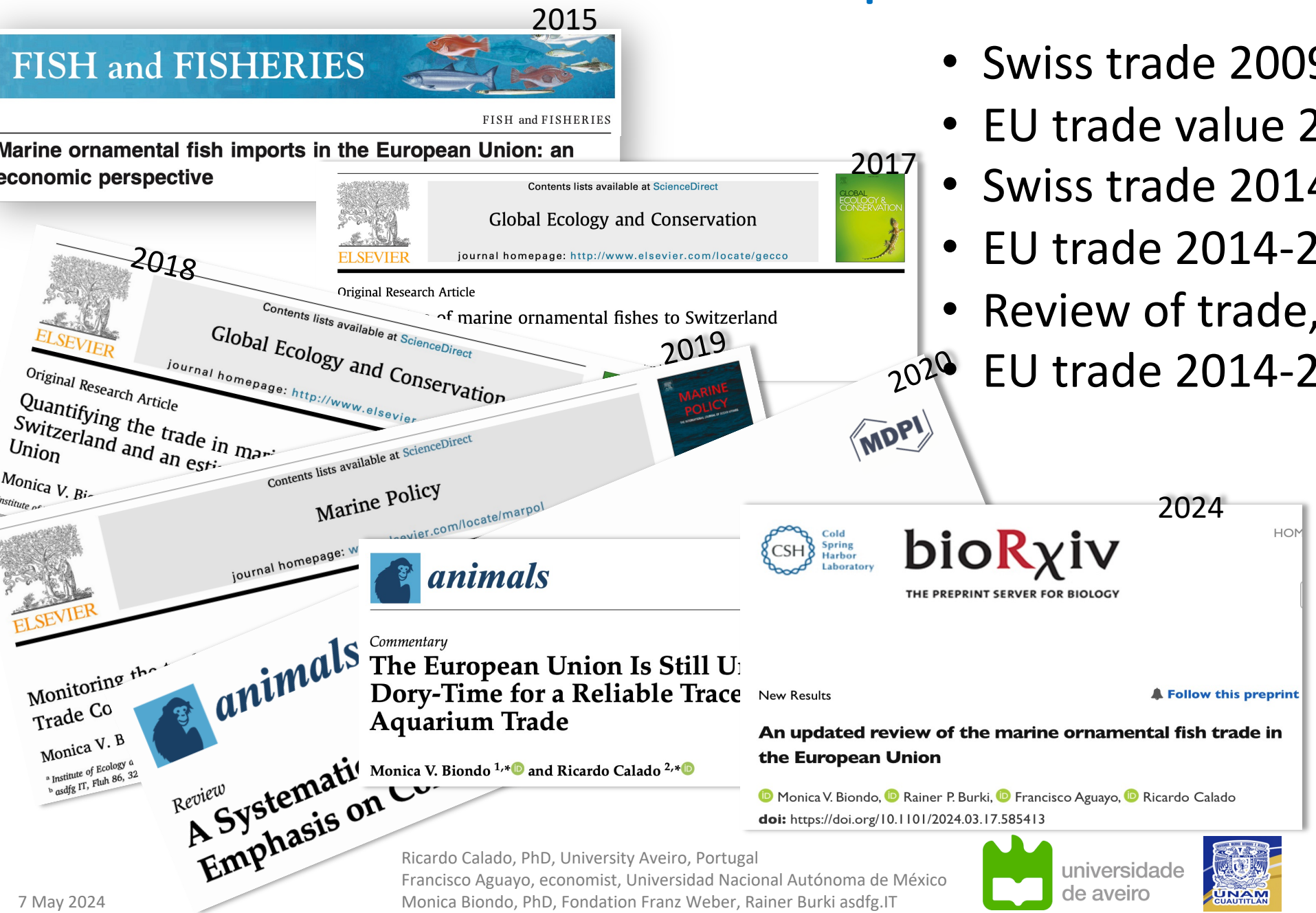
Peer-reviewed publications



- Swiss trade 2009, publ. 2017
- EU trade value 2010-2011,publ. 2015
- Swiss trade 2014-2017, publ. 2018
- EU trade 2014-2017,publ. 2019
- Review of trade, publ. 2020
- EU trade 2014-2021, publ. 2024

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TRACES

TRACES
TRAde Control and Expert System

Purpose of the TRACES platform, 3 minutes Film

https://food.ec.europa.eu/horizontal-topics/traces_en

- IT-system **monitoring imports of live animals** into the EU to ensure animal and **health safety since 2004**
- **All traders must register** exports/imports into the EU
- Currently used by **90 countries**, **113,000 users**, available in **39 languages**.

-> Collecting data on marine ornamental fishes since 2014

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TRACES

Increased transparency, traceability and food safety

- **Alerts** of **harmful organism** and **pathogens**
- **Saving time** for EU Member States, third countries, exporters, importers, carriers
- **Electronic signatures** enhance authenticity and **security**, reducing forgery risk or loss

-> Although TRACES is not a specific tool for monitoring wildlife trade, it does so for biosecurity reasons.

[Short film; Purpose of the TRACES platform, 3 minutes]

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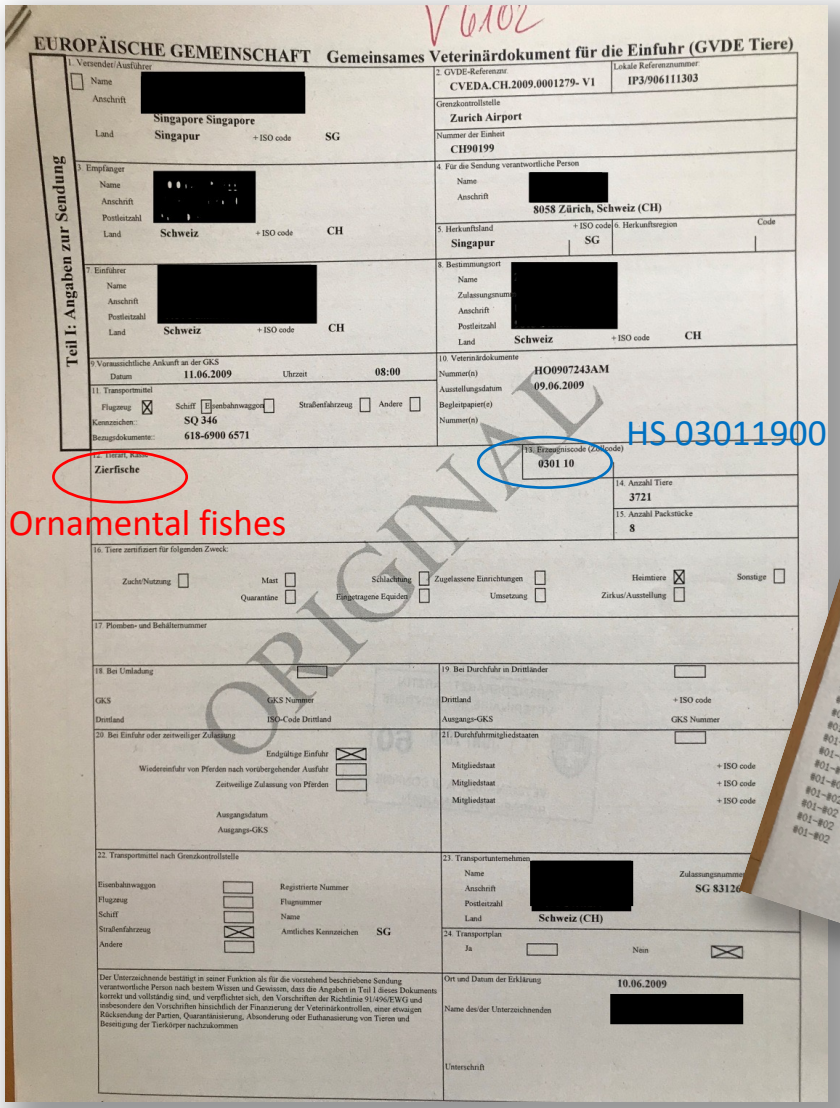
Paper documents replaced


EUROPÄISCHE GEMEINSCHAFT Gemeinsames Veterinärdokument für die Einfuhr (GVDE Tiere)

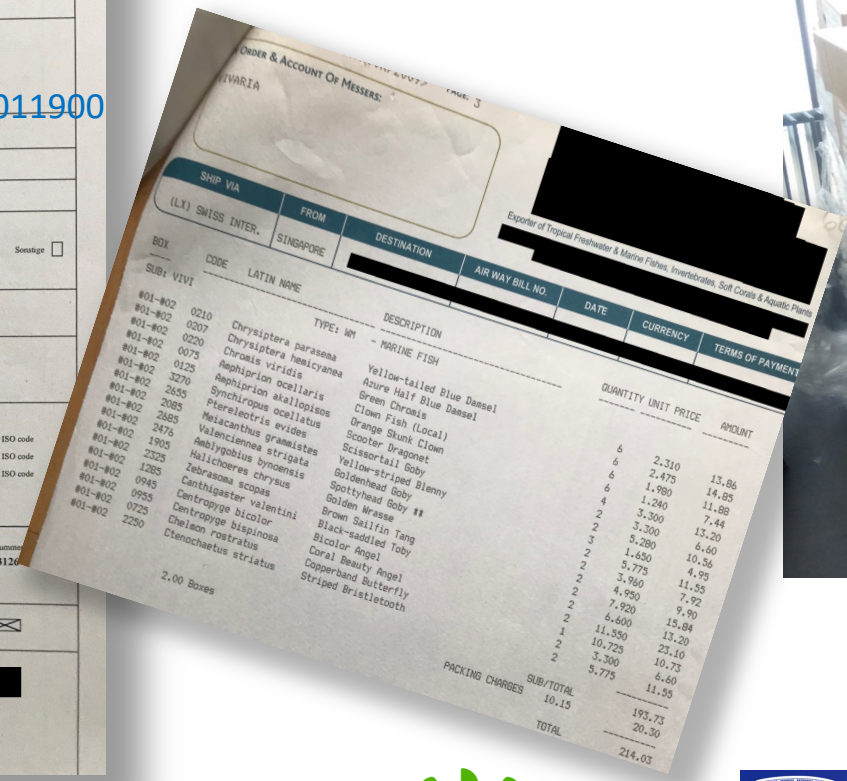
Teil I: Angaben zur Sendung

1. Versender/Ausführer — Singapore Singapore, Singapur, SG
2. GVDE-Referenznr. CVEDA.CH.2009.0001279- V1 — Lokale Referenznummer IP3/906111303
Grenzkontrollstelle Zurich Airport
Nummer der Einheit CH90199
3. Empfänger — Schweiz, CH
4. Für die Sendung verantwortliche Person — 8058 Zürich, Schweiz (CH)
5. Herkunftsland Singapur, SG — 6. Herkunftsregion
7. Einführer — Schweiz, CH
8. Bestimmungsort — Schweiz, CH
9. Voraussichtliche Ankunft an der GKS — Datum 11.06.2009, Uhrzeit 08:00
10. Veterinärdokumente — Nummer(n) HO0907243AM, Ausstellungsdatum 09.06.2009
11. Transportmittel — Flugzeug, Kennzeichen: SQ 346, Bezugsdokumente: 618-6900 6571
12. Tierart, Kasse: Zierfische
13. Erzeugniscode (Zolltarifcode): 0301 10
14. Anzahl Tiere: 3721
15. Anzahl Packstücke: 8
16. Tiere zertifiziert für folgenden Zweck: Zucht/Nutzung, Mast, Schlachtung, Zugelassene Einrichtungen, Heimtiere, Sonstige, Quarantäne, Eingetragene Equiden, Umsetzung, Zirkus/Ausstellung
17. Plomben- und Behälternummer
18. Bei Umladung — GKS, GKS Nummer, Drittland, ISO-Code Drittland
19. Bei Durchfuhr in Drittländer — Drittland, Ausgangs-GKS, GKS Nummer
20. Bei Einfuhr oder zeitweiliger Zulassung — Endgültige Einfuhr, Wiedereinfuhr von Pferden nach vorübergehender Ausfuhr, Zeitweilige Zulassung von Pferden, Ausgangsdatum, Ausgangs-GKS
21. Durchfuhrmitgliedstaaten — Mitgliedstaat
22. Transportmittel nach Grenzkontrollstelle — Eisenbahnwaggon, Flugzeug, Schiff, Straßenfahrzeug, Andere; Registrierte Nummer, Flugnummer, Name, Amtliches Kennzeichen, SG
23. Transportunternehmen — Name, Anschrift, Postleitzahl, Land: Schweiz (CH), Zulassungsnummer SG 83126
24. Transportplan — Ja, Nein
Der Unterzeichnende bestätigt in seiner Funktion als für die vorstehend beschriebene Sendung verantwortliche Person nach bestem Wissen und Gewissen, dass die Angaben in Teil I dieses Dokuments korrekt und vollständig sind, und verpflichtet sich, den Vorschriften der Richtlinie 91/496/EWG und insbesondere den Vorschriften hinsichtlich der Finanzierung der Veterinärkontrollen, einer etwaigen Rücksendung der Parten, Quarantänisierung, Absonderung oder Euthanasierung von Tieren und Beseitigung der Tierkörper nachzukommen
Ort und Datum der Erklärung: 10.06.2009
Name des/der Unterzeichnenden
Unterschrift

ORIGINAL

HS 03011900

Ornamental fishes



- Import documents Common Veterinary Entry Document for **HS 03011900** (Live ornamental fish [excl. freshwater])

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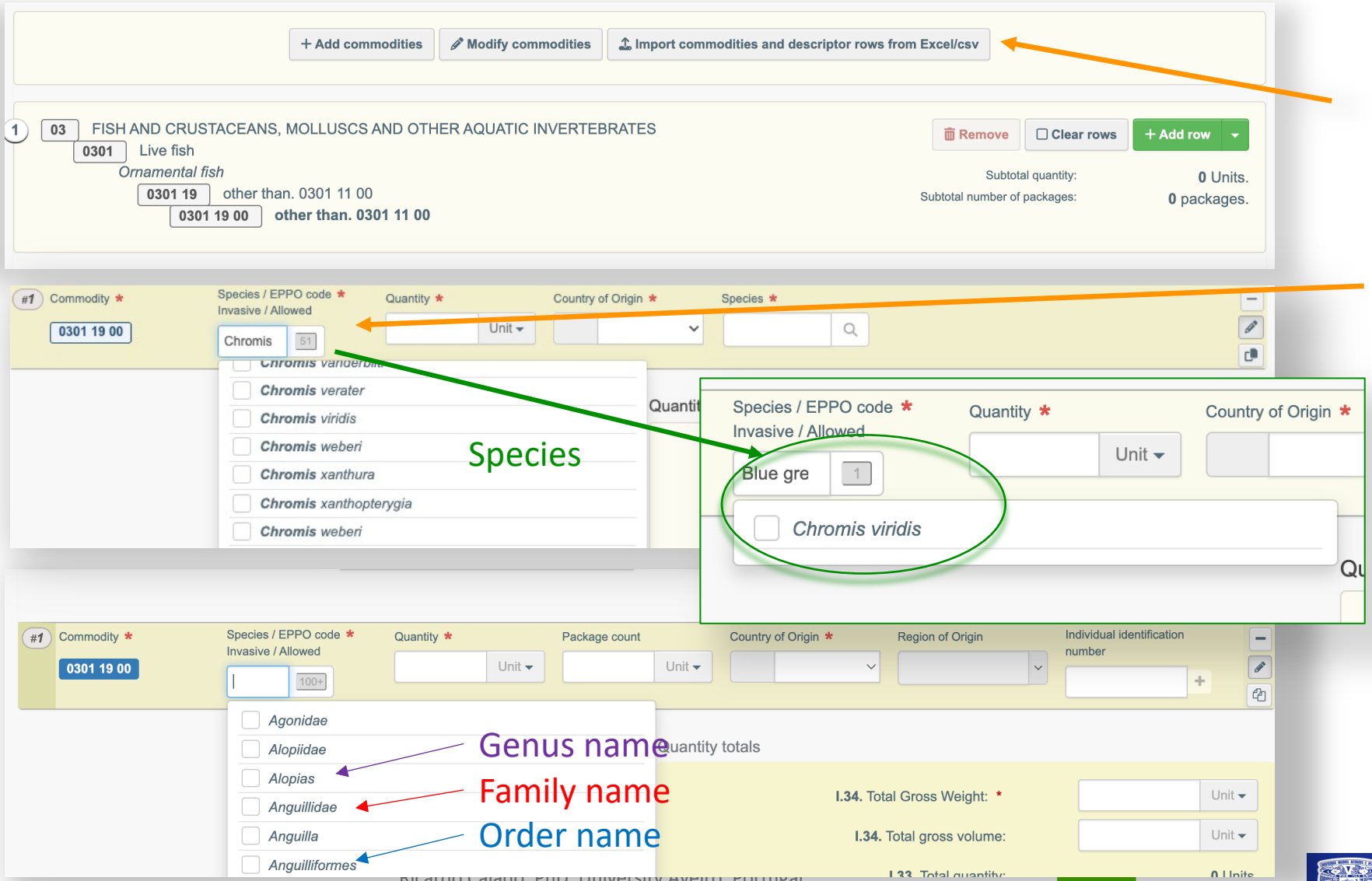
TRACES user interface



Pros:

➔ **Import as Excel files**

- **Allows scientific names**
- **Allows common names and suggests their scientific names**

Cons:

- Allows **species**, **genus**, **family** or even **order** level
- Origin/exact source can be misleading
- 30 % of specimens are NOT at species-level, but at family-level

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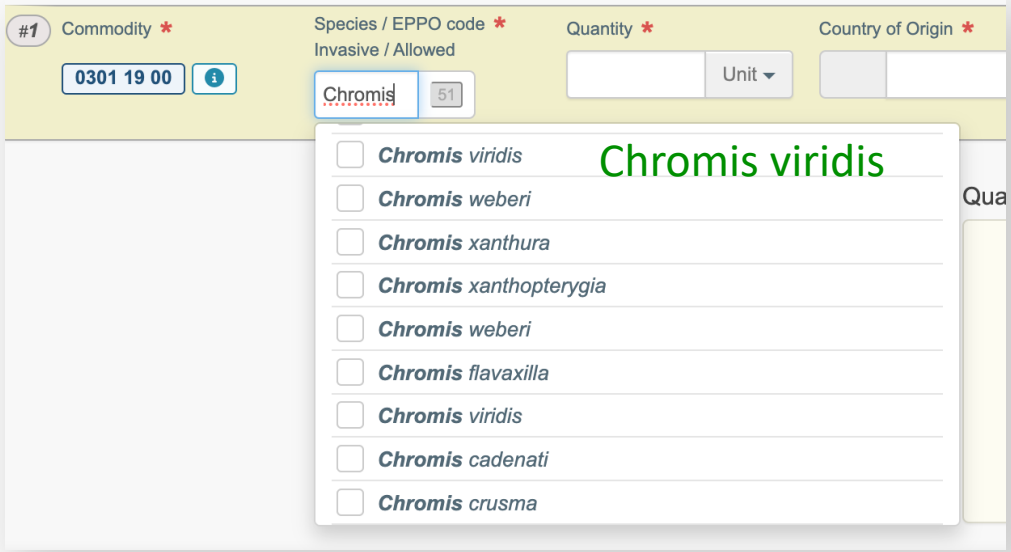
Fine tune TRACES



1. Scientific names

Only allow **marine ornamental fish scientific name** (***genus*** and the ***specific epithet*** or an unambiguous common name) according to WORMS (World Register of Marine Species) www.marinespecies.org

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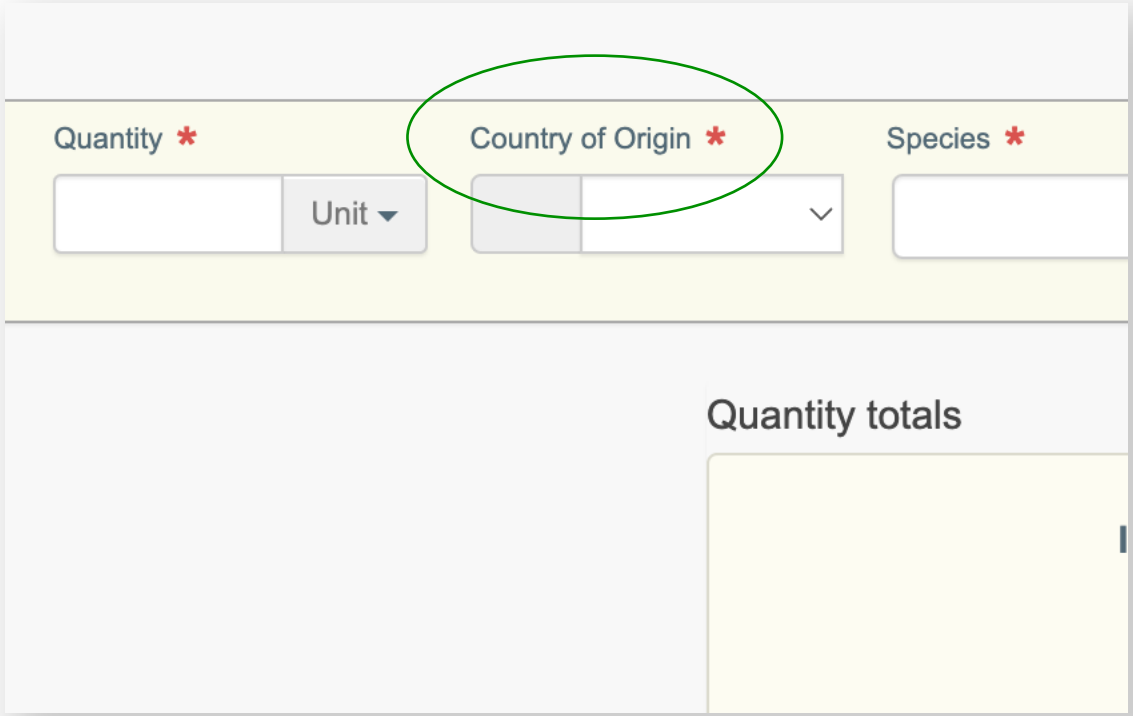

2. Detail the source

Exact source: **origin of capture** (not hub such as Singapore).

Specify if specimens are **sourced from the wild or captive bred** (facility name, country).

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EU legislation

A. Lallemand, Unsplash

The EU Parliament's resolution of the 5th October 2022 emphasized the importance of addressing the trade of marine ornamental fishes as most are still wild caught.

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The trade

- **Nearly 100 years old with its effects on marine ecosystems still largely unknown**
- Over 4,000 coral fish species known, **over 2,300 species are traded, with the overwhelming majority being wild caught**
- **24 species common, 37 moderately bred in commercial numbers are in trade (1-2% of all species traded),** 338 species at research stage (Pouil et al., 2020)
- **Globally: 15-30 million specimens/year**
- **Unknown levels of mortality** along the supply chain
- Trade is estimated to be **worth US$ 1.5 billion annually**

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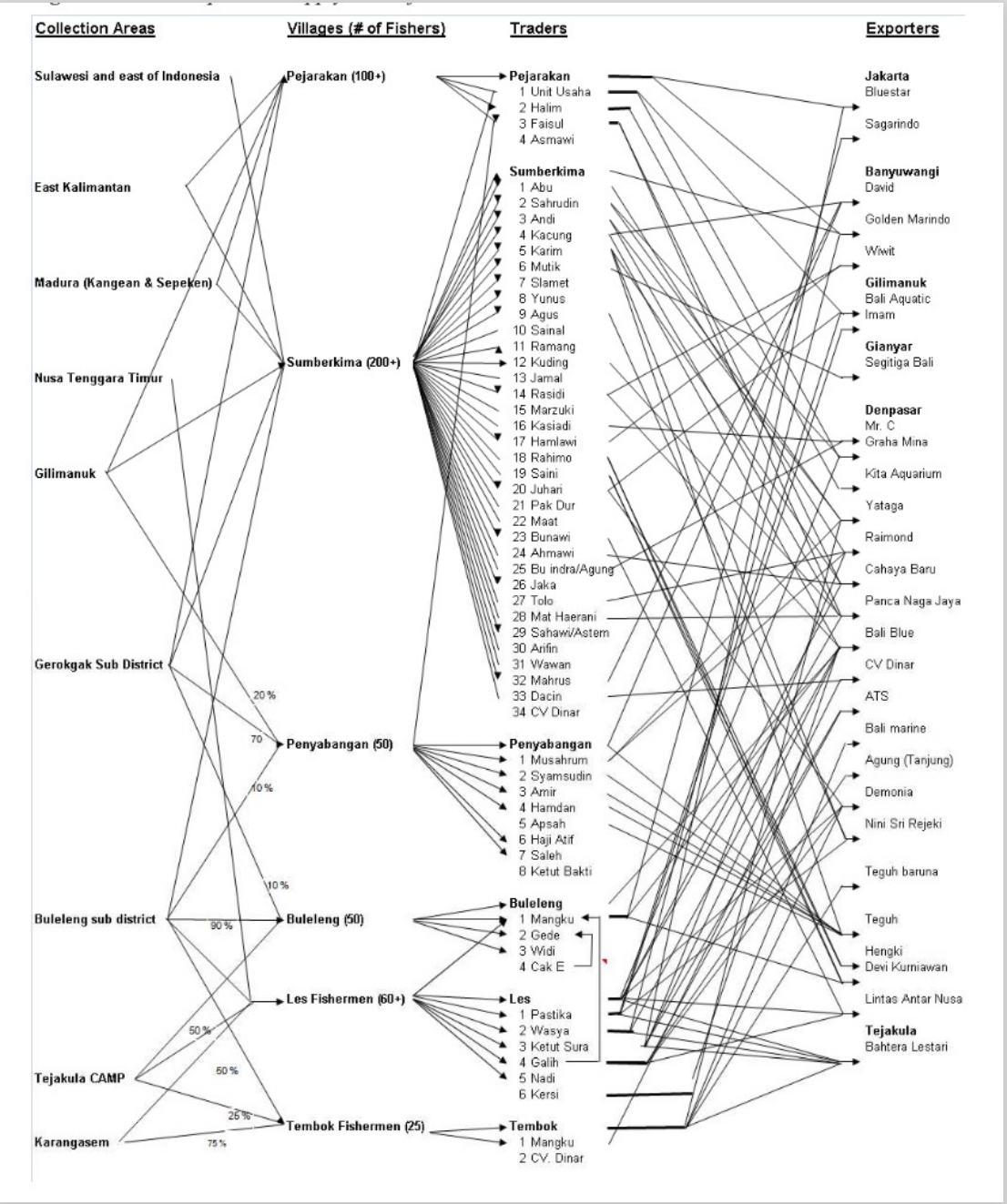

The supply chain

- Supply chain **extremely fragmented** and **diffuse**
- Many stakeholders involved: Unknown number of **collectors (hundreds, thousands?), middlemen, exporter and importer wholesalers and retailers**

Example from Northern Bali

From: Amos & Clausen, 2009: Certification as a Conservation Tool in the Marine Aquarium Trade: Challenges to Effectiveness

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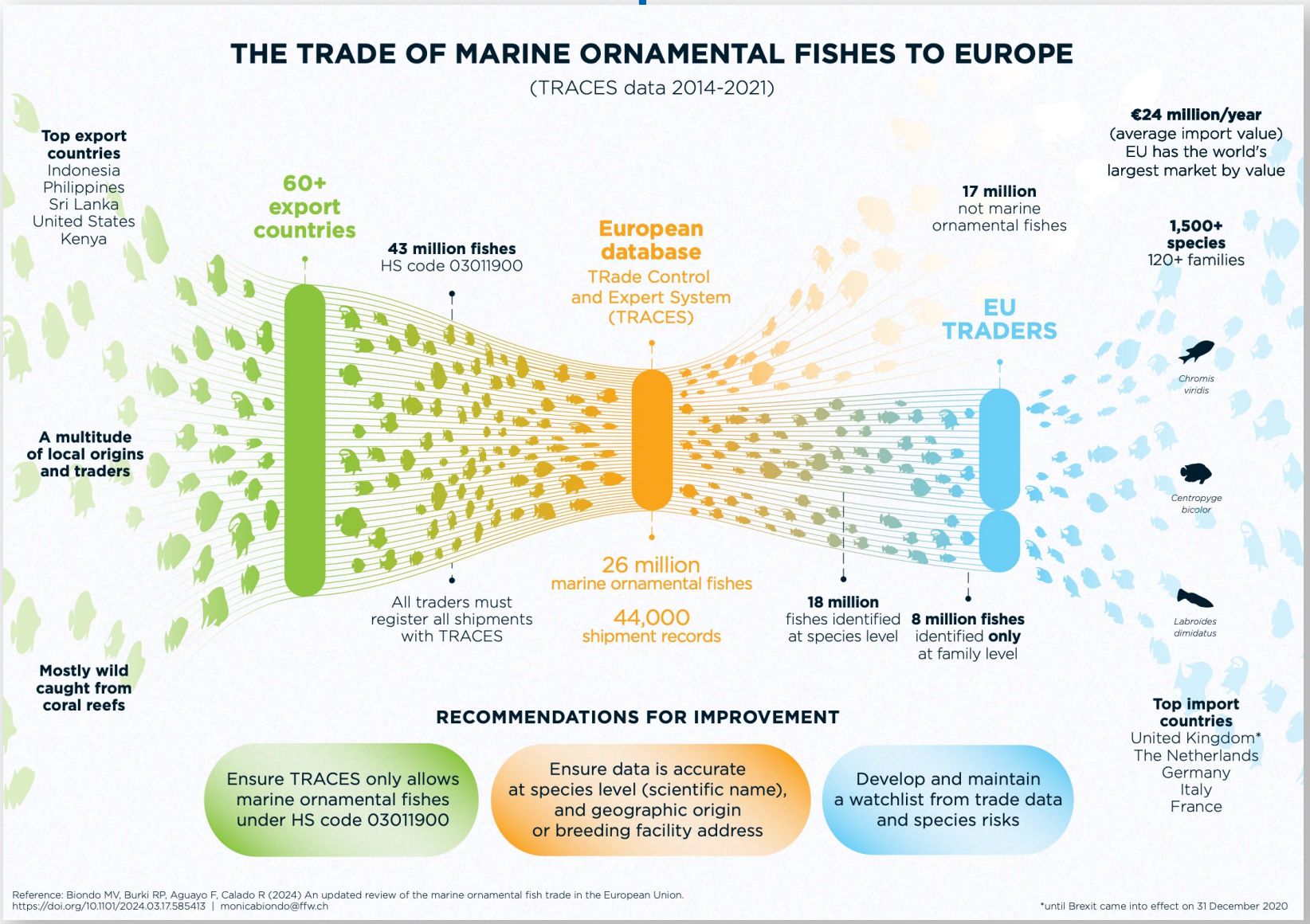
An updated review of the marine ornamental fish trade in the European Union: 2014 - 2021



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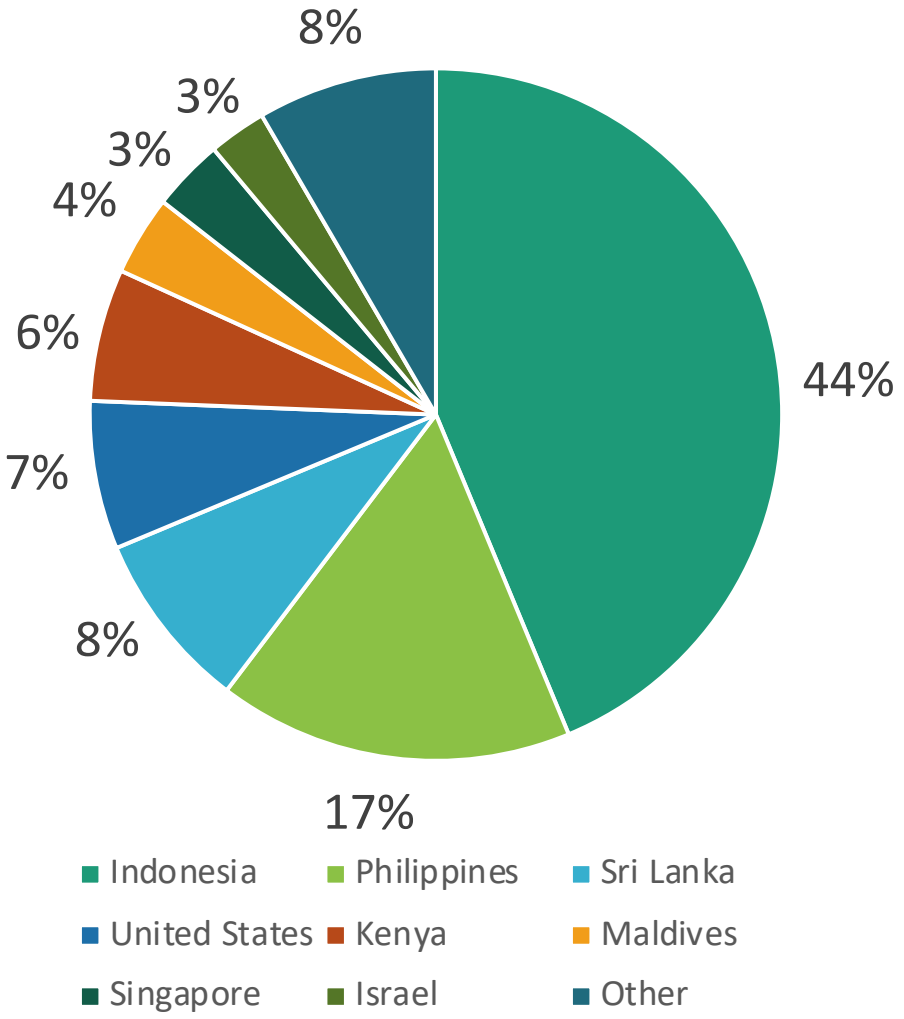
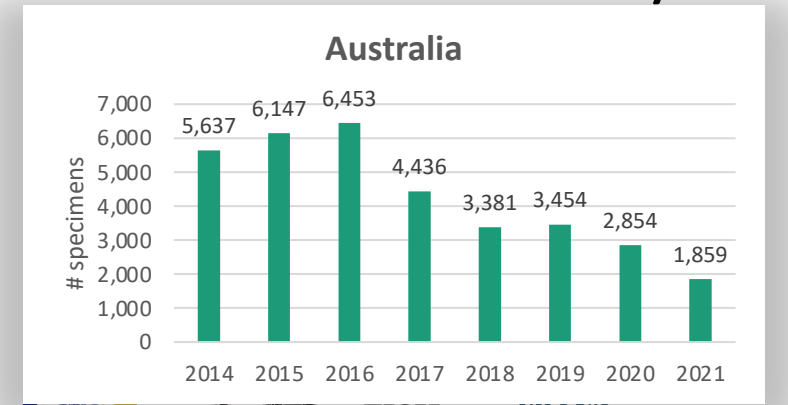
Exporting countries



- **61 exporting countries**
- Main exporting countries: **Indonesia, the Philippines** and **Sri Lanka: 68.7%** of specimens
- Adding **United States, Kenya**, **the Maldives, Singapore and Israel: 91.6%** of all specimens
- These **eight countries alone represent 83.1% of the import value**: **Indonesia** followed by the **USA**

Australian exports rank 21:



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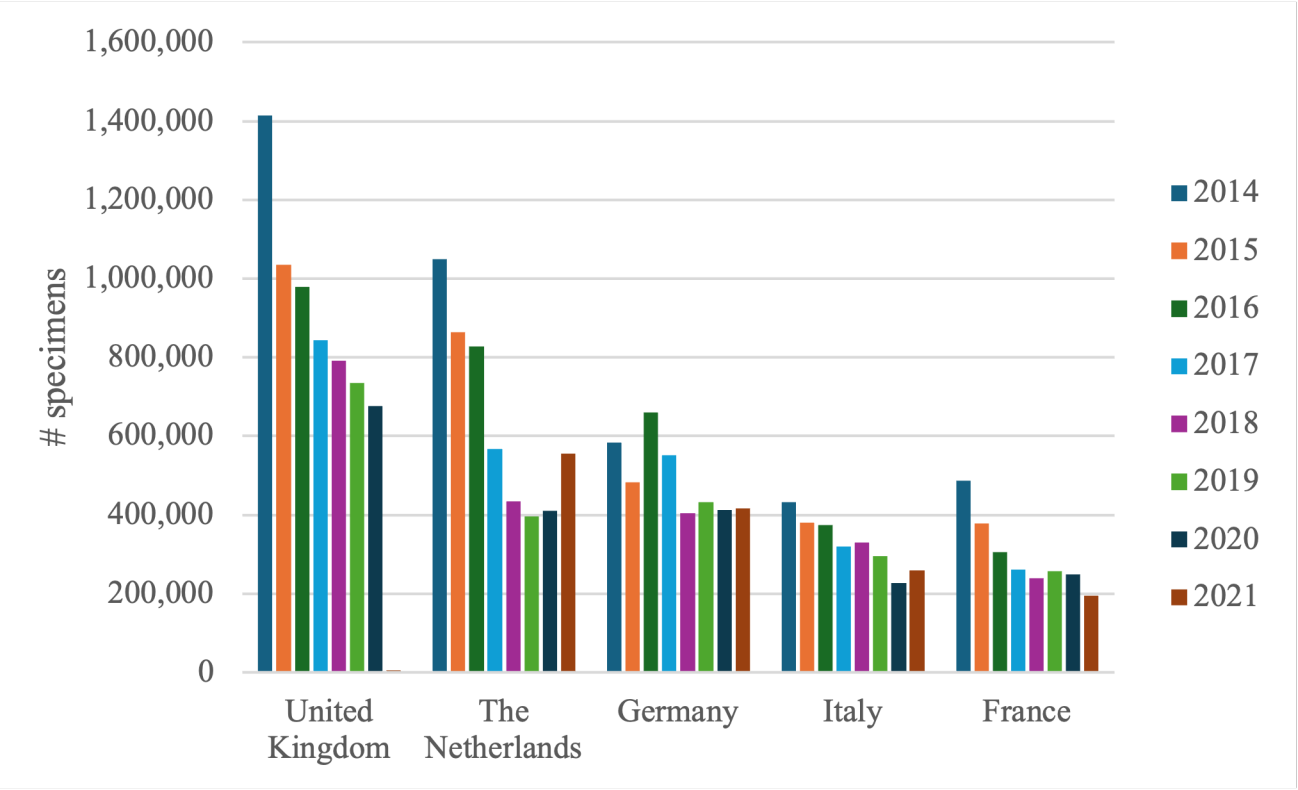
Importing countries



- **30 European countries importing** (incl. Iceland, Norway and Switzerland)
- The **United Kingdom** primary importer, except for 2021 (left EU),
- followed by **The Netherlands, Germany, Italy** and **France**.
- These **five countries** imported **80.5%** of all marine ornamental fishes into Europe.

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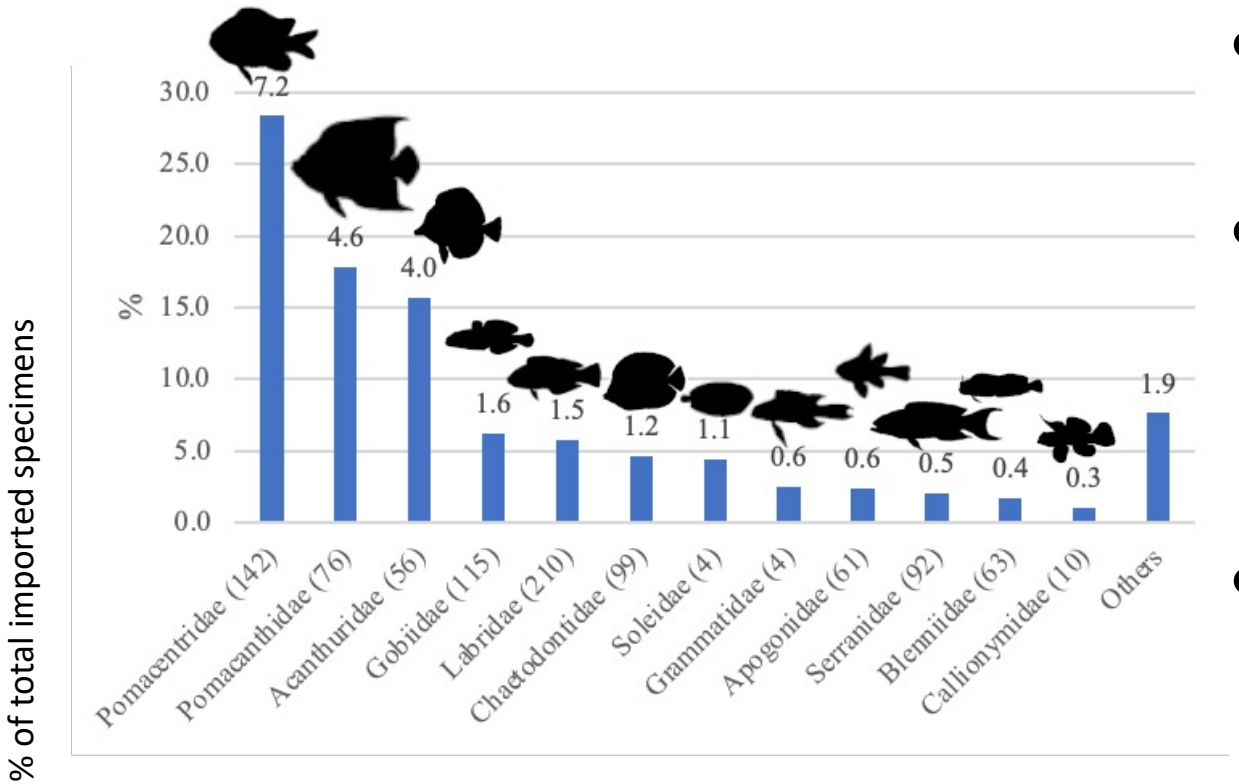
Families and species



imported species per family in parentheses
on top of the bar representing millions of specimens

- 2014-2021 overall **120 families** and **1,452 species** were imported
- **Top 12 families** imported accounted for **92.4% of all imported marine ornamental fishes** (specimens) **in Europe**
- Family **Labridae** featured the highest number of imported species: **210 species**
- **Pomacentridae** was the most traded family in number of specimens**:** **7.2 million specimens**

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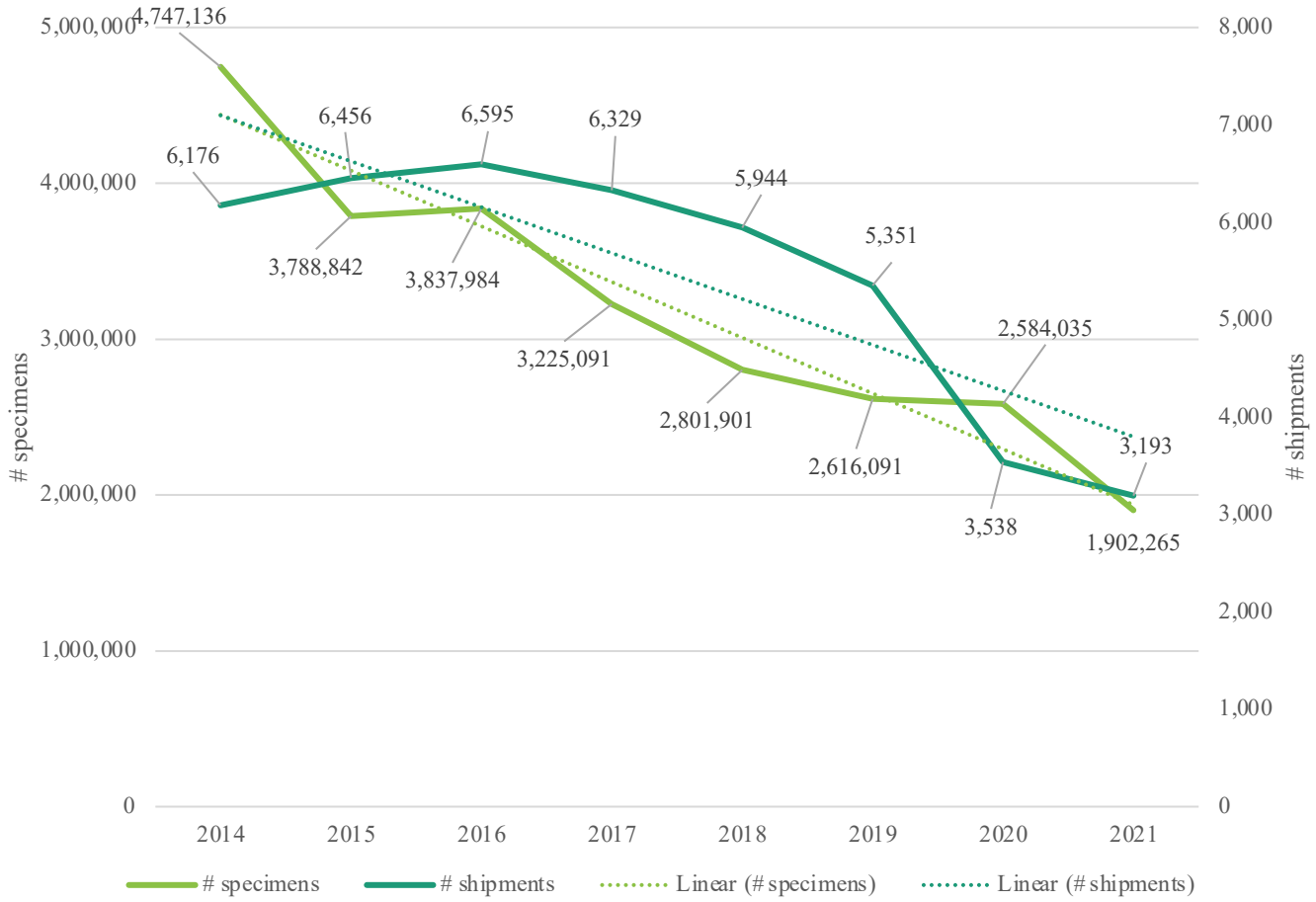
Substantial decline in trade



From 2014-2021 there was a sharp decline on imports: from **5 to 2 million specimens**

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Substantial decline on imports of Blue green damselfish *Chromis viridis*

- This was the most traded species, representing alone **12.4% of all imports** into Europe 2014-2021
- **70% decline in number of imported specimens!**

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Substantial decline in Blue green damselfish *Chromis viridis*

- It was evaluated by the IUCN Red List in 2022 as **‘least concern’**
- According to the IUCN Red Lists its population trend: **decreasing**

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Watchlist: What species to monitor more closely

The **Watchlist** presents a threat indicator for each species called ‘score’.
It combines:

- **number of specimens traded**
- **import trends** (increase/decrease of number of specimens/year)
- **vulnerability index** (according to FishBase; life history traits)
- **Conservation status** (according to IUCN Red List; population dynamics)

➔Easy way to assess a potential threat through trade
➔It is important to consider different methods and/or their combination
➔If a fish is categorised as threatened/endangered by the IUCN, its trade should be more closely monitored

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Watchlist: What species to monitor more closely

WatchlistPLUS: Prioritise species according to appearance in trade to the EU/Europe from 2014 to 2021:

139 species:

- # of specimens
- trend in traded # (linear regression)
- Vulnerability according to FishBase
- Sustainability according to IUCN

LINK: https://www.biorxiv.org/content/10.1101/2024.03.17.585413v1.supplementary-material
(Watchlist+)

All the species traded in Europe, listed according to the following criteria (Watchlist, 1,452 species including sharks and rays): # of specimens, Vulnerability according to FishBase, Sustainability according to IUCN Red List
LINK: https://www.biorxiv.org/content/10.1101/2024.03.17.585413v1.supplementary-material (species specimens)

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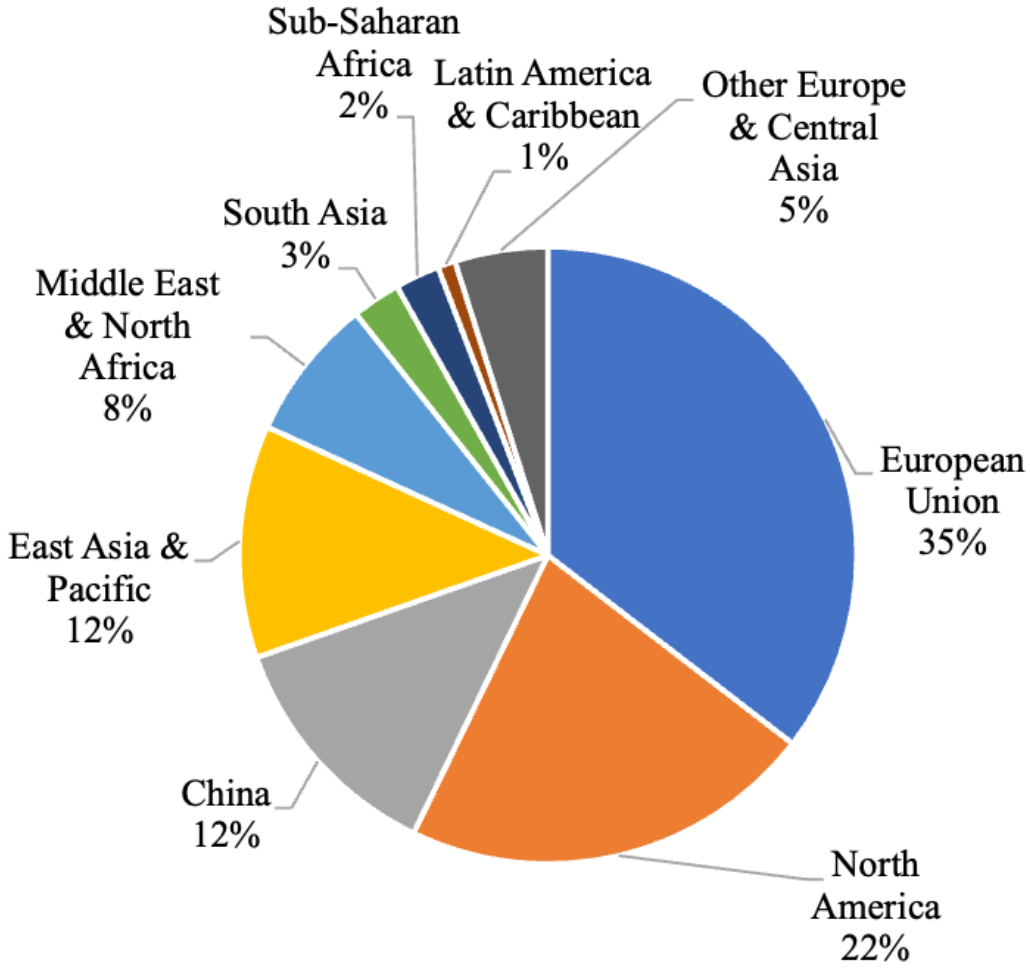
Value of trade by region



*UN Comtrade data

Europe is the largest world importer by value (share (%) of import value,2021*):

- The EU accounted for 35% (at 24 million Euro), of the 70 million Euro of the global trade value of this trade
- North America 22%, China and East Asia and Pacific 12 % each

-> **Note** that number of specimens for **China**, **Asia & Pacific, Central/South America, Africa etc.** are **unknown**

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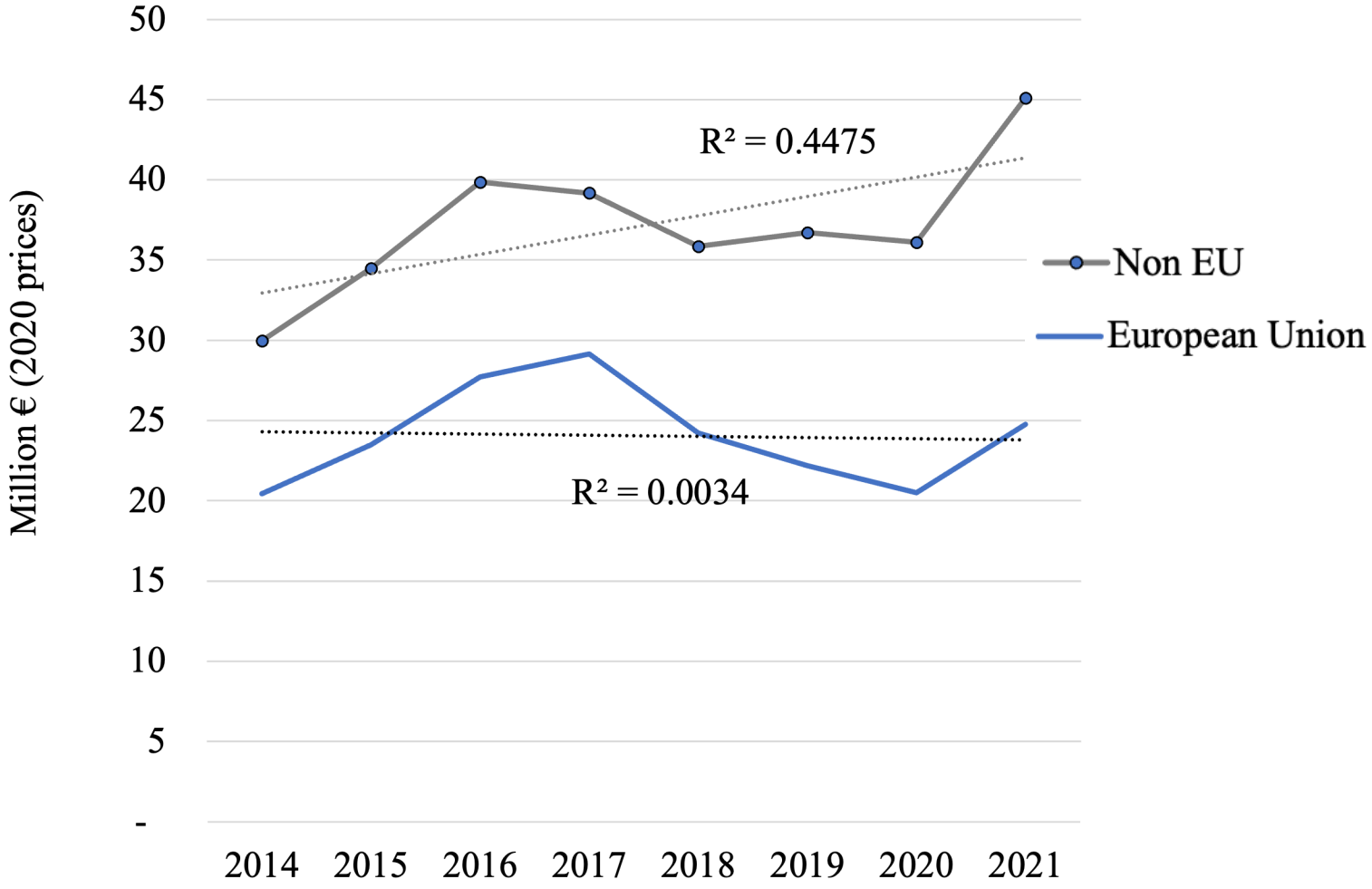
Value of EU and world trade



- While **number of specimens** imported are **declining**
- **Value** in the **EU** is on the **rise,** with this **trend being even more pronounced globally**

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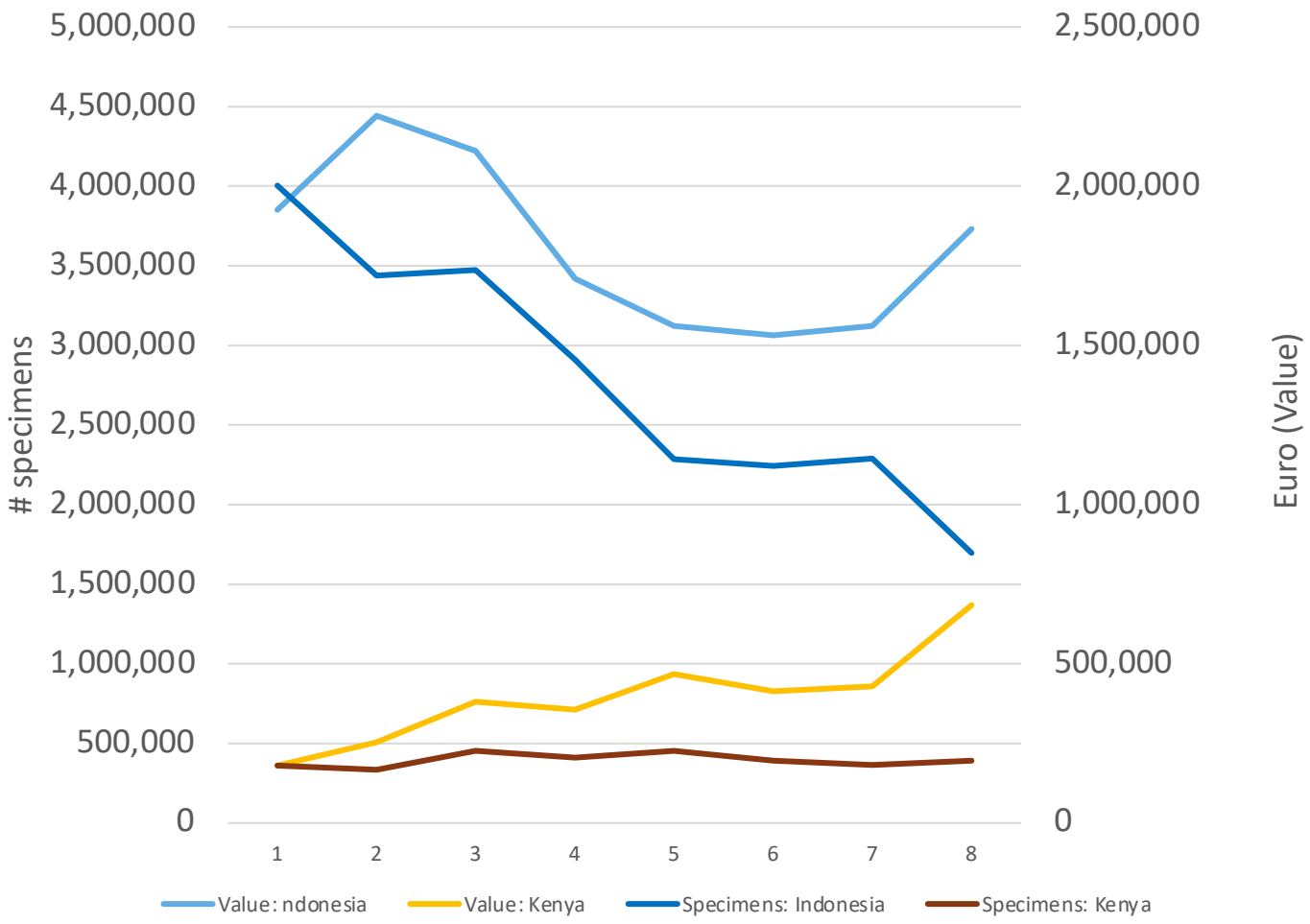
Value and number of specimens



Two examples:

- # of specimens from **Indonesia** decreased but value increased
- # of specimens from **Kenya** stable but value increased more.

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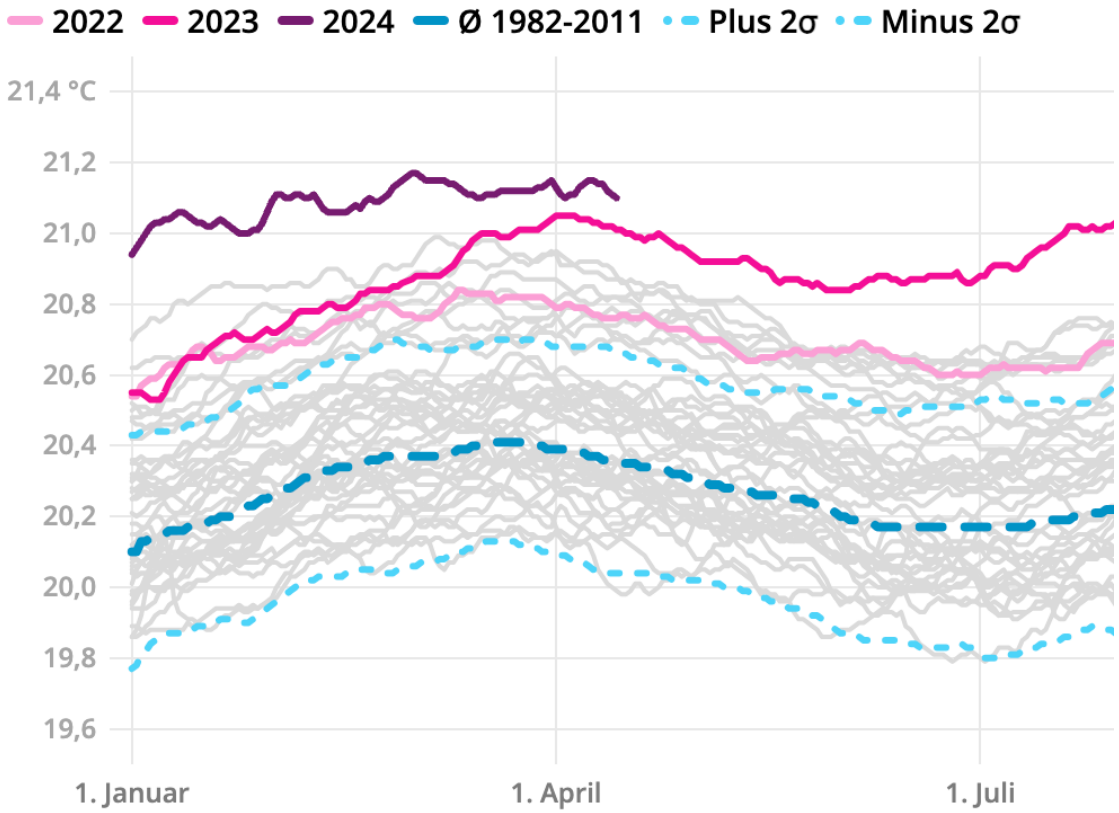
Daily sea surface temperature (NOAA)



Source: Watson; https://climatereanalyzer.org/clim/sst_daily/

"If this were an experiment, I would have initially believed it was a measurement error", Prof. Dr. Reto Knutti, ETH Zürich, main author of several IPCC reports.

Mean 1982-2011
2022
2023
2024

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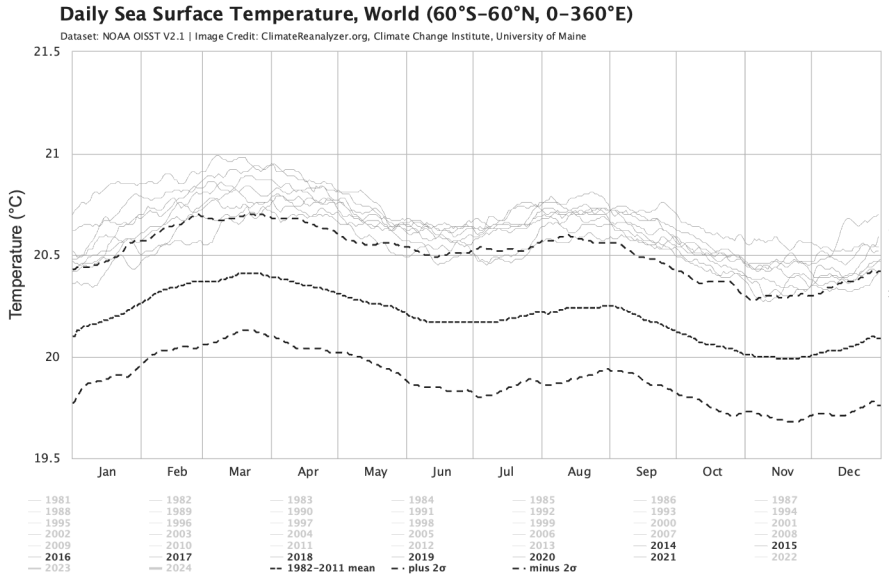
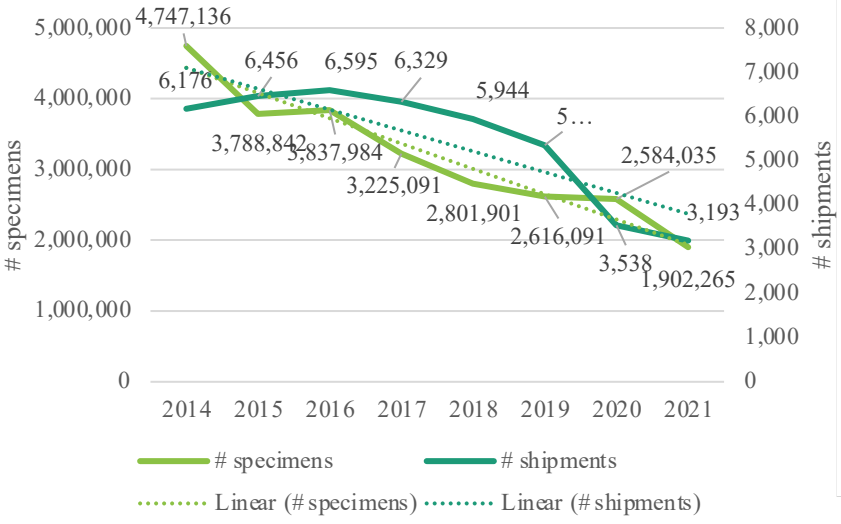
Consider a broader perspective: Coral reefs are in jeopardy

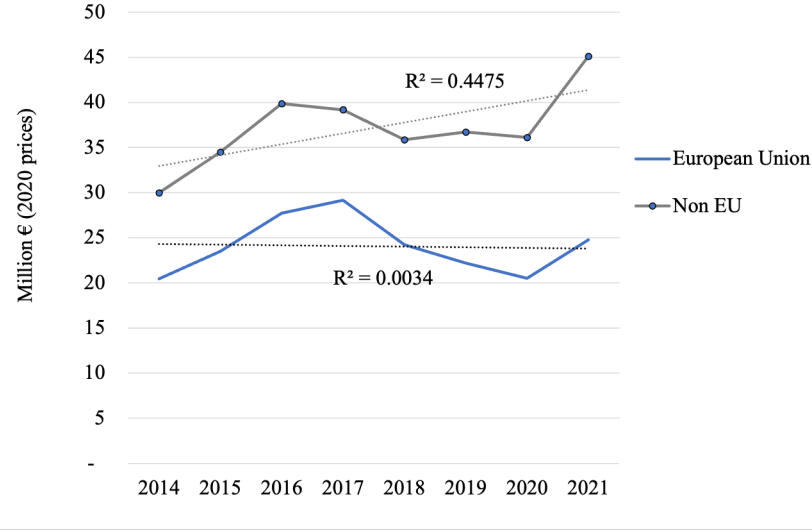
Where are we heading?



Source:
https://climatereanalyzer.org/clim/sst_daily/



Number of traded specimens 2014-2021



Value of traded specimens 2014- 2021

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In conclusion

- **Monitoring in the EU: Use TRACES do not re-invent the wheel**
- Fine tune TRACES:
  - Only allow **species-level information**, **source** (geographical origin), **Captive-bred** (facilitys name) or **wild-caught (biosecurity)**
- Monitoring in **other parts of the world**. Also use TRACES?
- Establish an **alert system** using multi-model-approach to determined if CITES monitoring required
- (Re-)evaluated at least the most traded species of coral reef fishes, **IUCN Red List**
- **Consider:**
  - Import countries should be the ones getting the numbers right
  - Import countries/consumers should pay; morally and legally
  - Legal framework necessary
  - Sea temperatures are rising, coral reefs are dying…

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Additional information for technical workshop on non-CITES-listed marine ornamental fishes, 7-10 May 2024, Brisbane, Australia

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