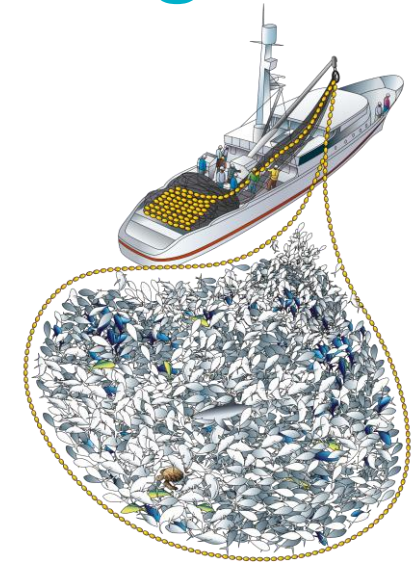# Evaluation of activities within the purse seine fishery through time

SC20 ST-WP-03_rev1

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Introduction

- This paper is an initial investigation into potential changes in reporting behavior by the purse seine fleet

- The observed pattern in question is increasing divergence between days at sea and fishing days

- Logsheet, observer and VMS data examined to compare fishing vs. non-fishing reporting days

- Scenarios developed to reclassify some daily activities reported on logsheets

- Reclassification resulted in potential increases of 2-32% in fishing days, on average, in recent years

Logsheet activities
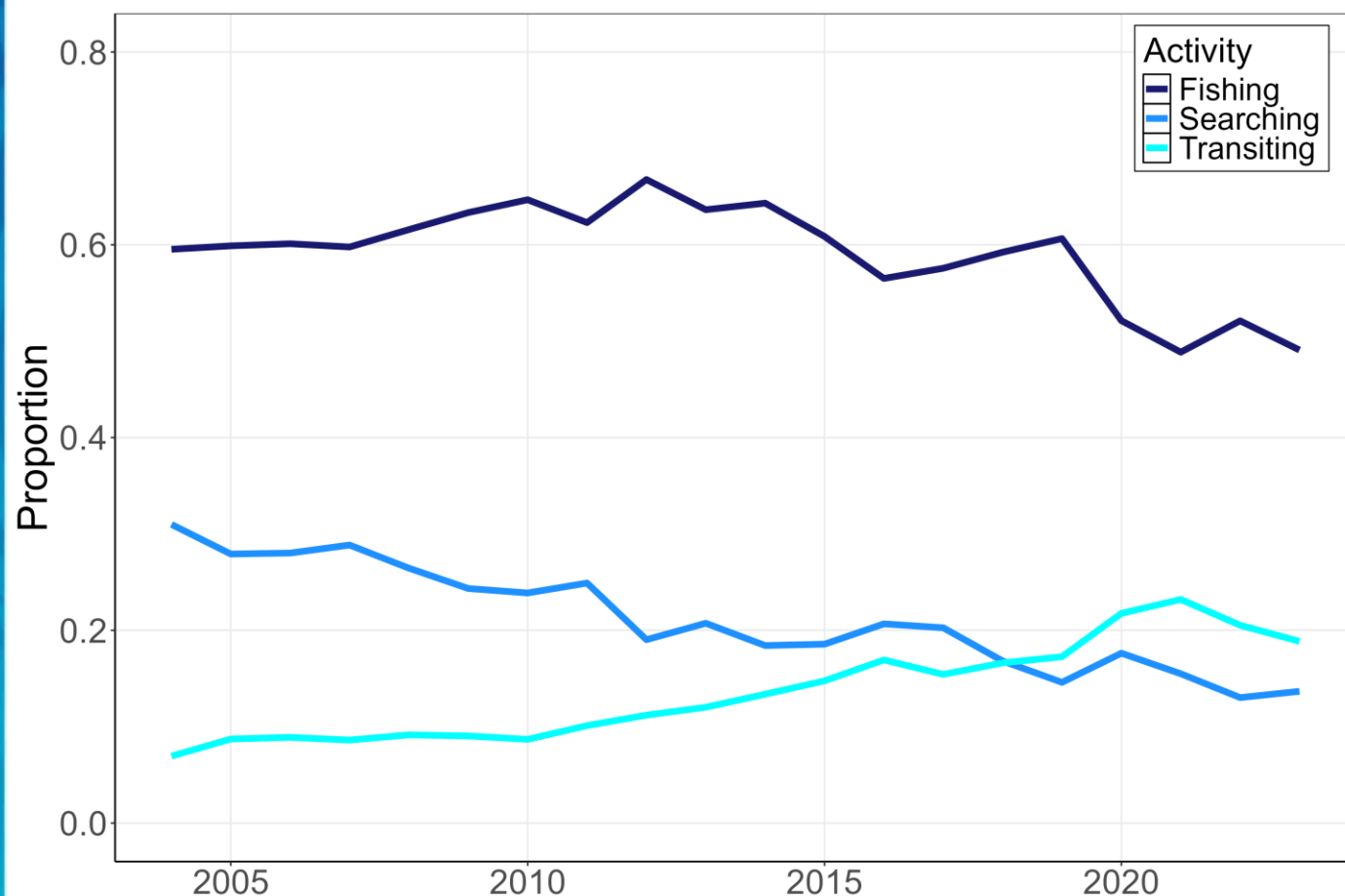
- Fishing has declined from 65% to 50% of logsheet activities over past decade

- Searching has declined from 30% to < 20% while transiting has increased from 10 to 20%

- Note these are the three main activities, not all of them so the sum here is not 100%

Set types after "Transiting"
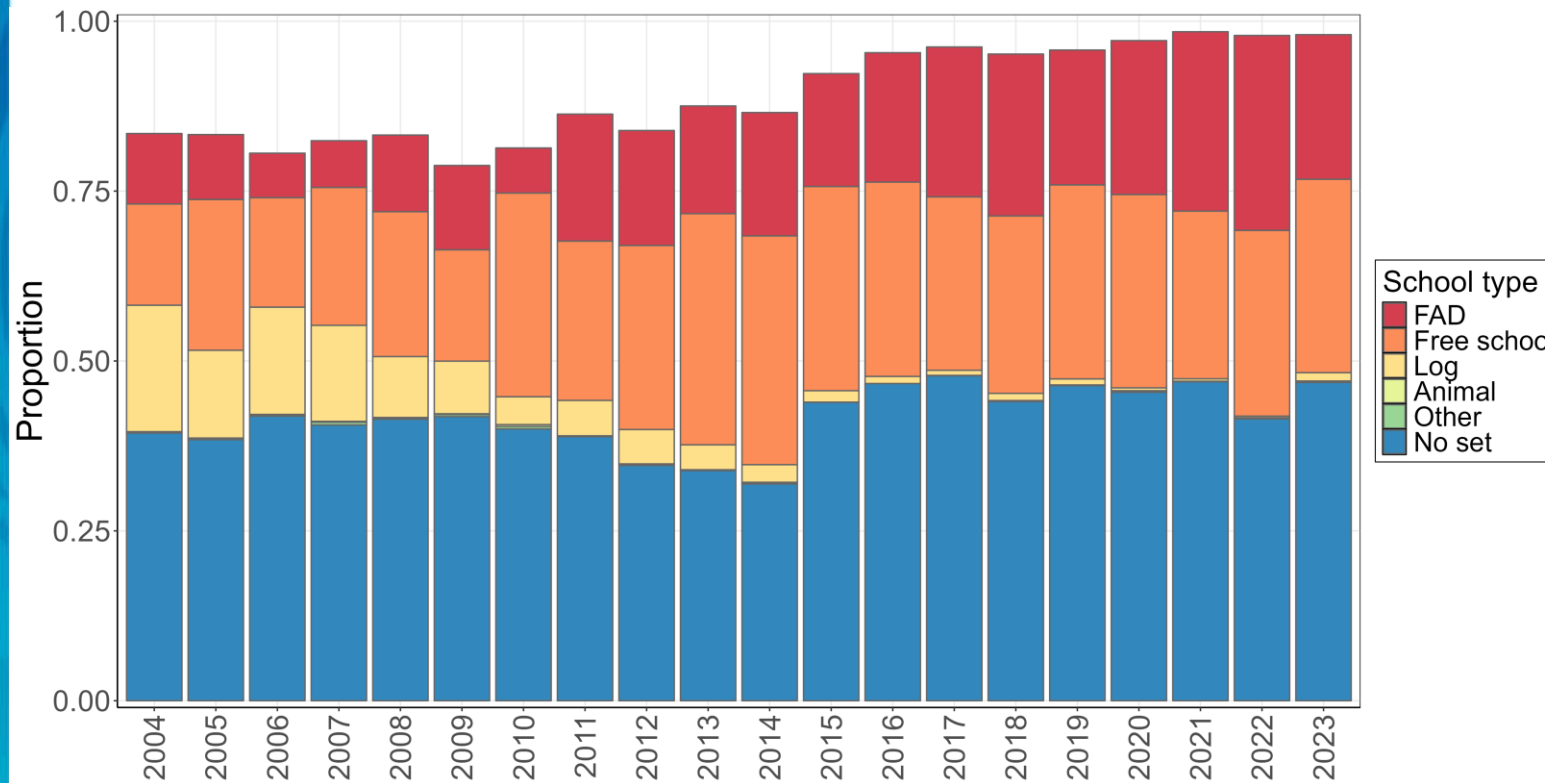
- Since 2010 FAD sets more often follow transiting (now 20-30%)

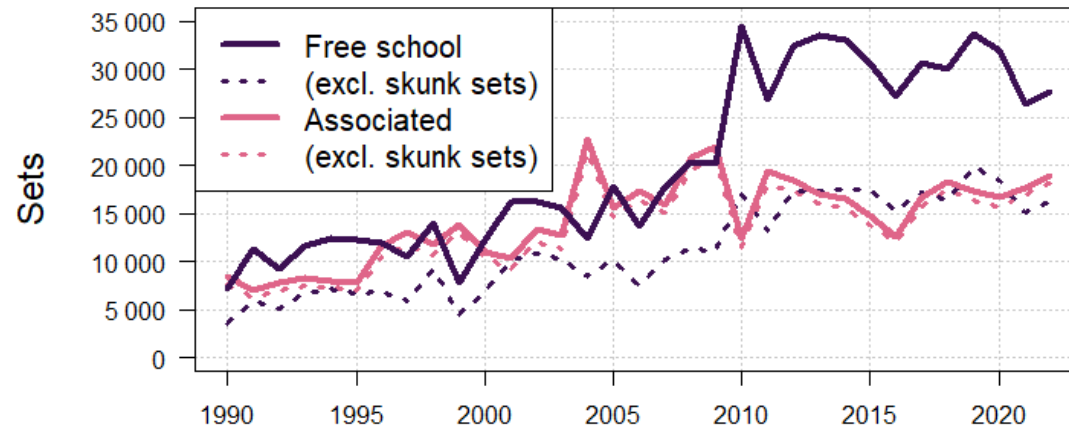- Free school (FS) sets about the same

- Log sets now rare

Activities before a set
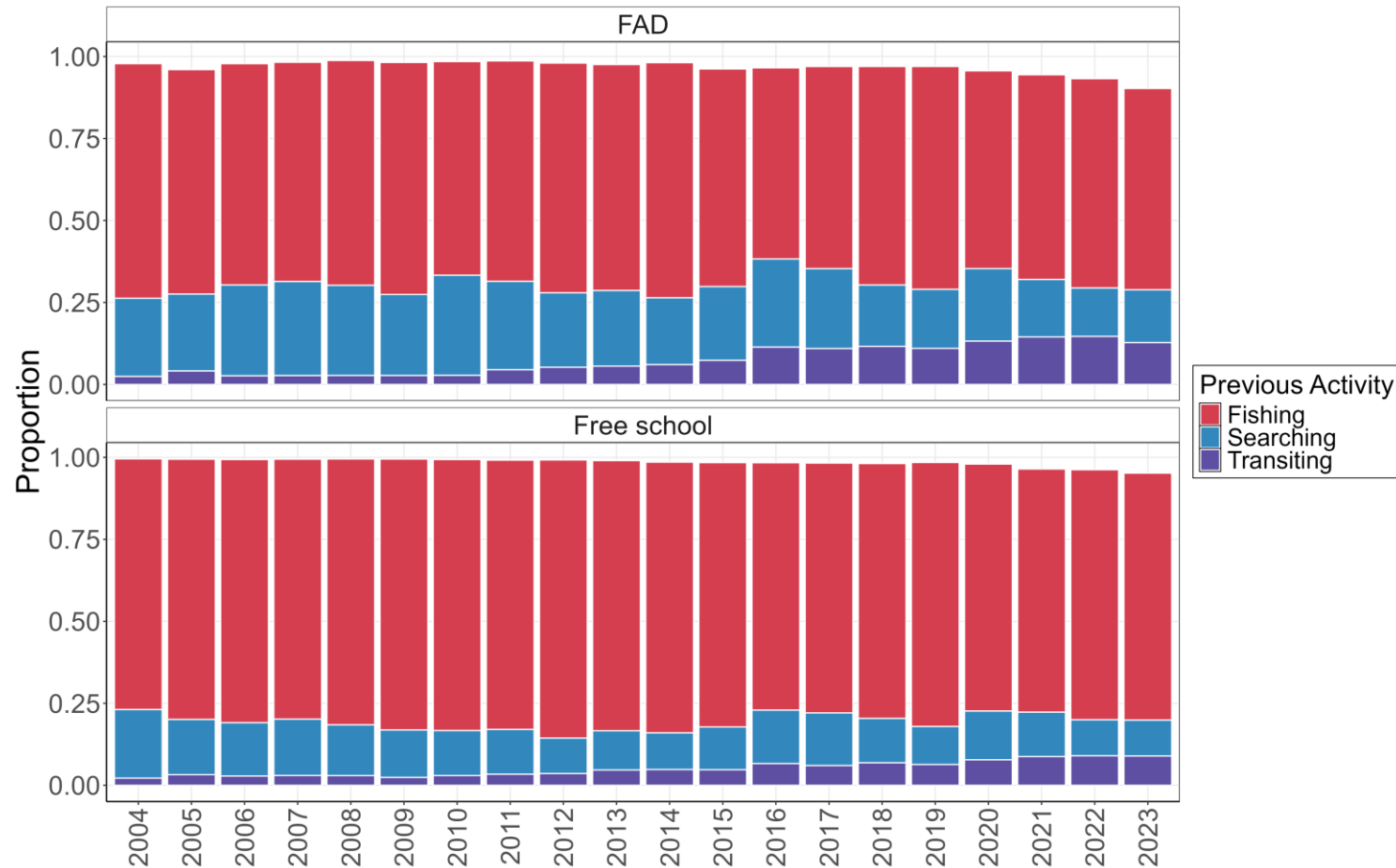
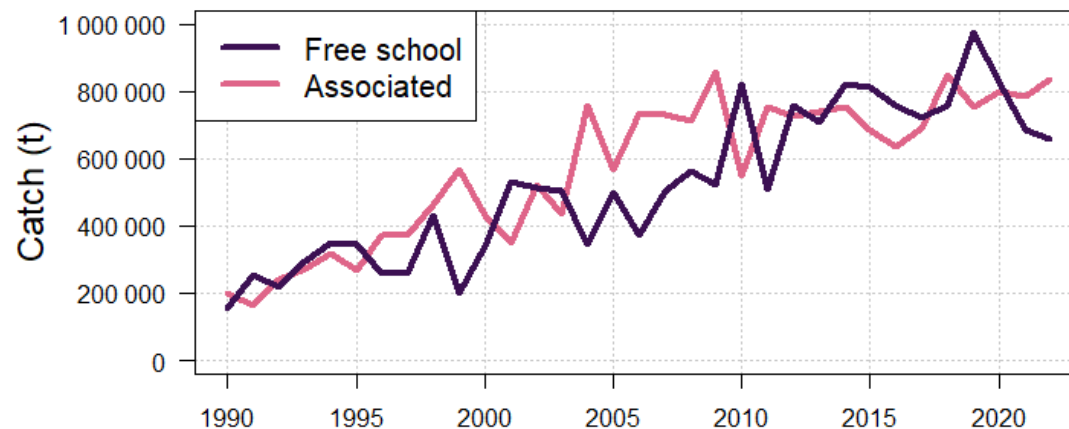- Since 2010, searching activity prior to a FAD set has decreased by 50% (transiting has doubled)

- Search time also decreased prior to FS sets

Activities before a set

Purse seine sets by set type

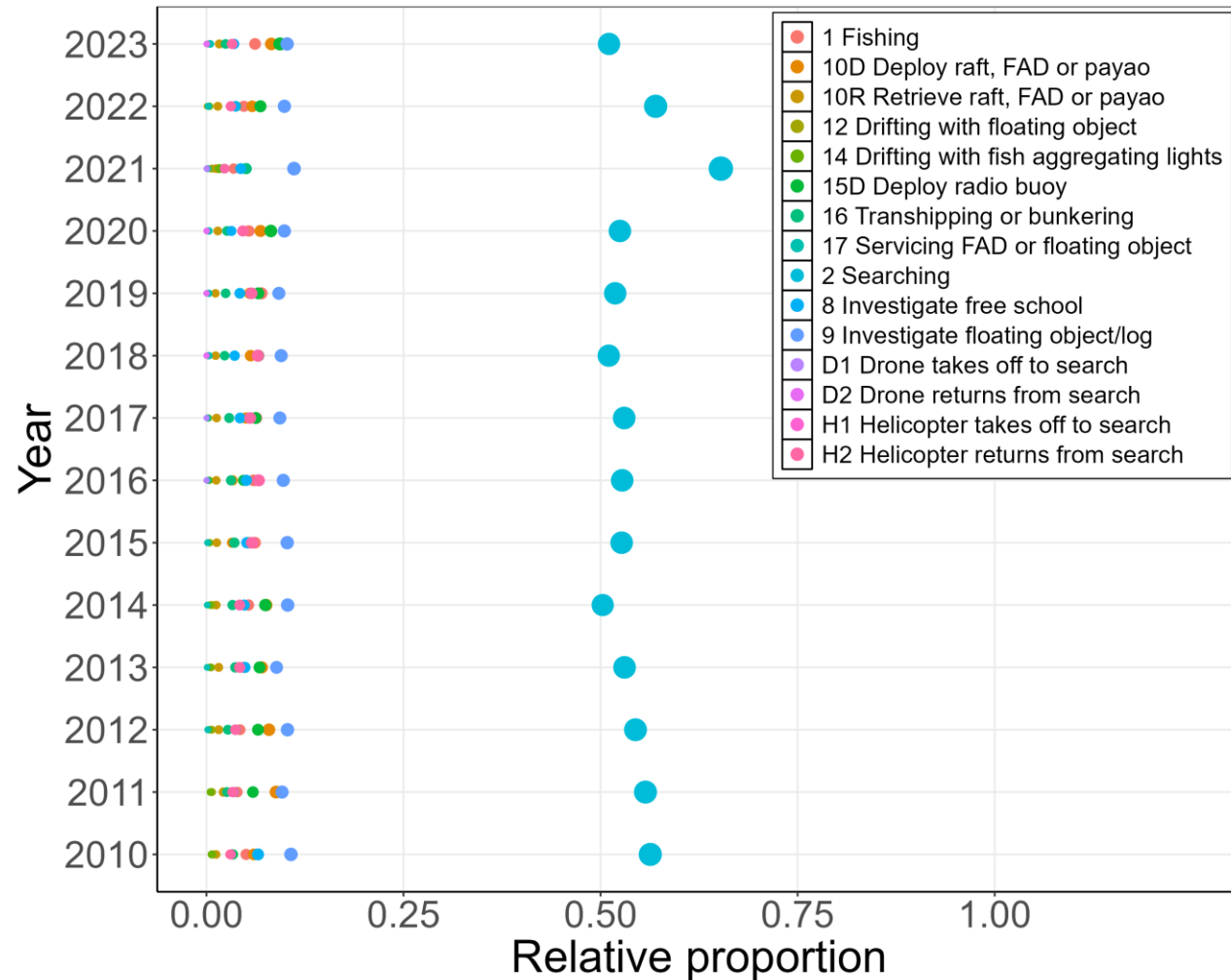Purse seine catch by set type

- In 2010, a big jump in FS sets, but level afterwards
- Big increase in FS "skunk" sets
- Couple of hypotheses for this – shift to FS during FAD-closure and/or opportunistic FS sets
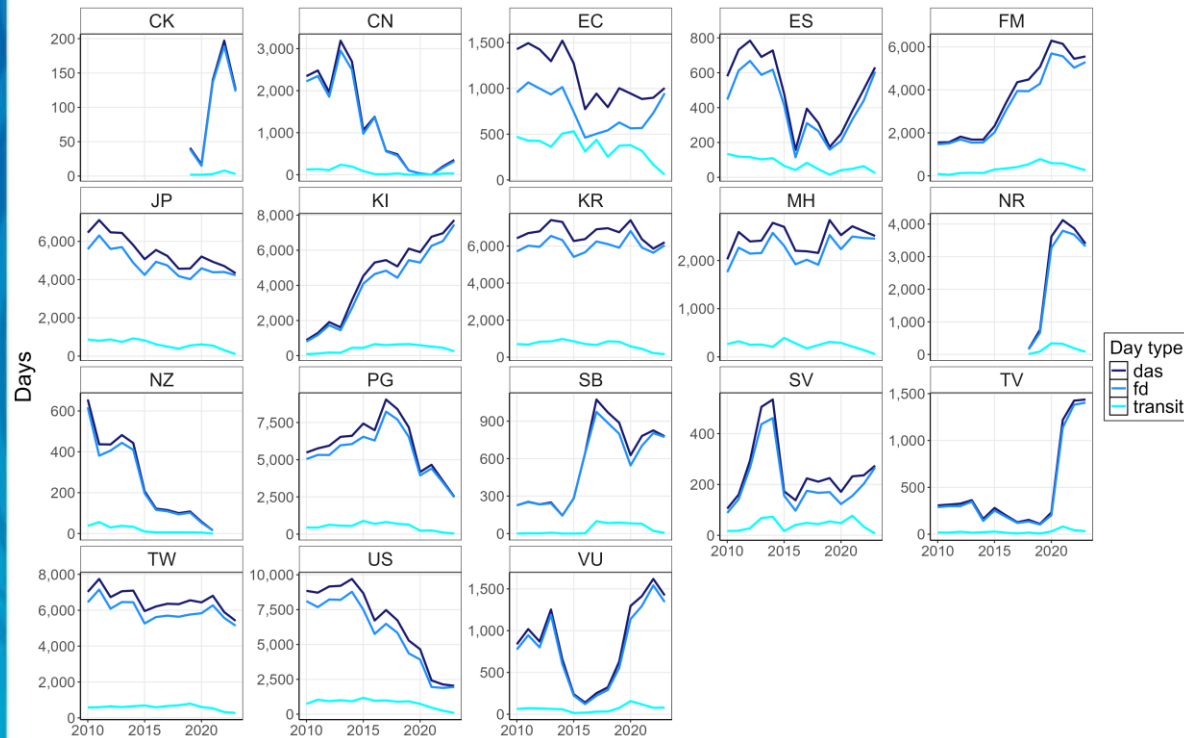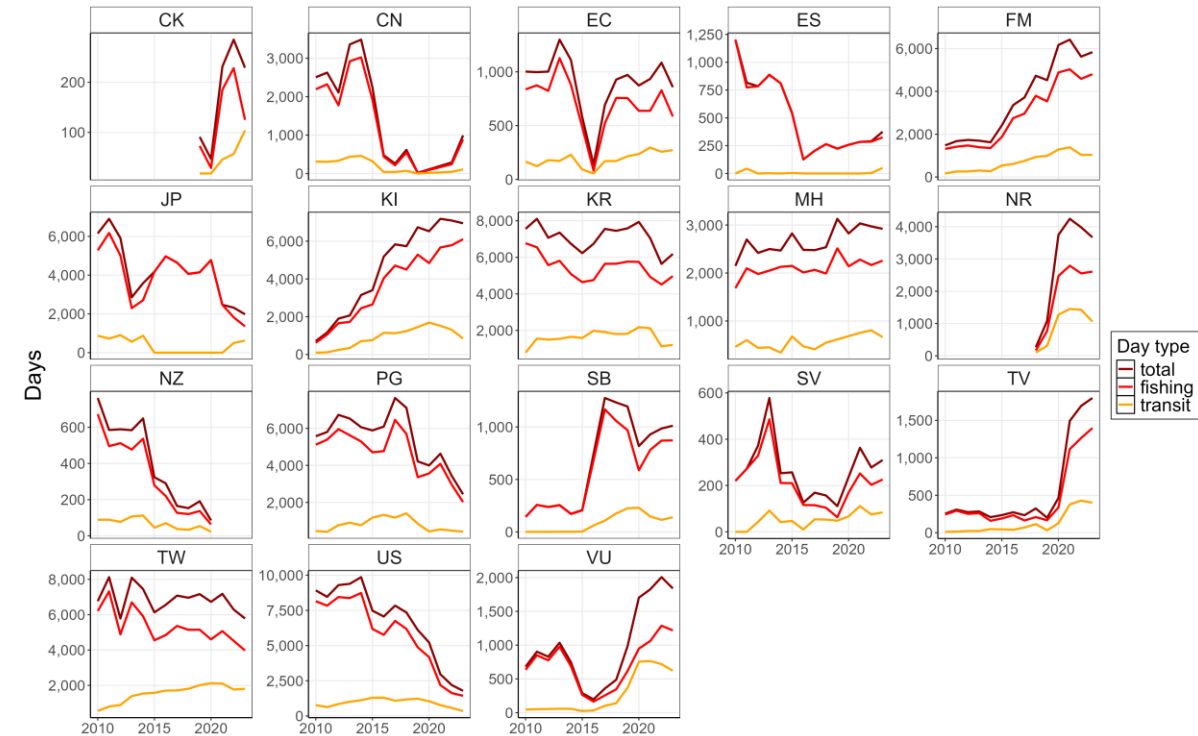
Observer match with logsheet reporting

- 83-91% of activities matched between logsheets and observers
- 7-15% of observer fishing days were logsheet non-fishing (see plot at left)

VMS match with logsheet reporting

Days estimated from VMS using the purse seine effort algorithm

Days calculated from purse seine logsheet data based on reported activities

Scenarios investigated for reclassifying

Activity	Explanation	Scenario
Baseline reporting	Sum of effort as reported as a set or searching	0
All days at sea	Consider all days minus the day of departure and day of return to port, as days fishing, unless the sum of reported fishing days is higher, in which case the higher value is used	1
Fish - Fish	Assume that if a vessel goes from one fishing set to another with only transiting activity in between, this activity is in fact searching, as it may be unrealistic to make a set without any searching	2,3,4
Transit - Fish	Similar to the logic for Fish - Fish, the assumption here is that it may be unrealistic to make a set without searching, direct from transiting behaviour	3,4
Boundary - Fish	For these records, it appears that fishing or searching activity has been declared just prior to or just after crossing a boundary. This may be a case of licensing. For example, if a vessel is not authorised to fish in a given area, they do not search nor fish there as a result. Even so, for this exercise (and in some scenarios), we will assume if a vessel was searching prior to crossing a boundary it is likely searching after crossing the boundary. Similarly, if a fishing set is made after crossing a boundary, the transiting prior to the boundary crossing is assumed ot be searching.	4

Year	Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4
2004	38,691	39,473	38,970	39,421	39,422
2005	38,996	41,539	39,378	40,103	40,103
2006	36,153	42,206	36,461	37,044	37,044
2007	39,123	44,714	39,472	40,126	40,126
2008	40,250	45,658	40,605	41,321	41,321
2009	41,768	50,114	42,043	42,754	42,754
2010	43,362	57,090	43,745	44,573	44,573
2011	48,065	53,832	48,666	49,738	49,738
2012	44,049	52,873	44,683	45,919	45,919
2013	44,707	57,580	45,440	46,915	46,915
2014	42,359	53,521	43,049	44,569	44,569
2015	36,016	47,179	36,524	37,665	37,665
2016	36,847	49,064	37,437	38,664	38,664
2017	43,013	53,086	43,782	45,022	45,043
2018	41,888	53,727	42,830	44,099	44,116
2019	38,940	51,680	39,671	40,950	40,990
2020	43,364	57,897	44,135	45,593	45,629
2021	40,749	55,647	41,669	43,110	43,192
2022	38,746	55,018	39,640	41,036	41,121
2023	38,097	51,399	38,875	40,037	40,150

Summary

- This evaluation was at a relatively coarse level, aggregating across fleets

- However, several changes in fishing strategies/reporting behaviours were identified

- Understanding effort is key for the scientific work of the Commission, including for CPUE analyses to inform assessments

- Potential future work: review logsheet reporting requirements, further develop VMS algorithm, explore FAD closure impact on behaviour/reporting, evaluate HS vs EEZ differences