Observer at-sea, sampling frame, 2020 - testing a GNS sampling frame

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1 The procedure

Scripts: Q:/dfad/data/Data/Lykkehjul/Program

Output: Q:/dfad/data/Data/Lykkehjul/Listerne

Graphics: Q:/dfad/data/Data/Lykkehjul/Program/graphics

Presentation: Q:/mynd/kibi/sampling/observer_at_sea/gillnetters - the figures for number have changed a bit since we now only includes vessels having >= 95% gillnet trips, in the presentation is was >= 50 %

2 The concept

- Purpose: Sampling discard / by-catch in an at-sea observer program, which covers gilnetters in inner Danish waters
- Target population: All fishing trips engaged in the above fisheries.

2.1 Sampling frame

The first step is to find the group of vessels mainly conducting the fishing trips in the target population, which are suitable for an at-sea observer program. These vessels will end up as the sampling units in the final sampling frame.

2.1.1 Main activity

A lot of vessels spent all the time being engaged in fisheries within the target population and will therefore naturally be a part of the sampling frame. Other vessels will spent all the time targeting small pelagic or fishing with passive gear, never conducting a trip in the target population, and will therefore naturally not be a part of the sampling frame. Lastly some vessels are engaged in a lot of different fishing activities during the year e.g. fishing small pelagic in some months and dermersal fish the rest of the year and will have some, but not all, fishing trips in the target population. These latter vessels will be included in the sampling frame if they don't spent more than 95 % of their trips outside the target population.

Each trip is assign to one of the following activities (in the order specified):

1. gillnets
2. non-gillnets (also including No_)

If a vessel spends >= 95 % of the trips in the gillnets category, then it is included. Vessels already included in the trawler / seiner samplingframe will not be included (don't think that is relevant after we only included vessels >= 95 % trips).

Some of the selected vessel will already be sampeld in the BYC CCTV study - these *will* also be included here.

2.1.2 Too small

Some of the vessels selected in the step above are too small to have an observer on board, so vessels less than 8 meters are excluded from the sampling frame.

2.1.3 Inactive

It is difficut to sample vessels with very low activity, so vessels earning less than 50,000 dkk or having less than 50 days at sea a year are also excluded from the sampling frame.

Dkk and days at sea are based on official records (logbooks ans sales slips), so these limits will be evaluated with results from the interview of SSF.

2.2 Stratification

The sampling frame not stratified. We evaluated a stratification by lab, in this case Bornholm and Lyngby, but the number of active gillnetter at Bornholm is very limited, so we decided to group these two strata.

2.2.1 Fleet - not relevant here

Each fishing trip conducted by the vessels in the sampling frame is assign to one of the following fleets based on metier:

1. Gillnetters

2.2.2 Lab - not relevant here

Each lab samples different ports. The vessel's home port is used to assign lab.

2.2.3 Main area - not relevant here

One of the strata above are split into two areas to ensure that both areas will be sampled.

Each fishing trip conducted by the vessels in the sampling frame is assign to the most fished. The area, which the vessels spends most trips in, is assigned to the vessel.

3 DFAD data

Fishing areas comes from dfadfvd_ret and metier level 6 from metier_level6_ret. Deleting rows without catch and vessels id's starting with DNK. If days at sea NA e.g. for vessel witout logbook, then 1.

3.1 DFAD - Allocating vessel id to a single version

In 2019, the Danish fishing fleet had 1354 active vessels.

During the year a vessel id (fid) can cover more than one version / vessel. The id is allocated to a single version (homeport, oal, btbrt) - the one with most landings.

In 2019, 37 out of 1391 unique combinations were removed due to this rule.

3.2 DFAD - Allocating a trip to a single area, metier and date

A fishing trip can cover more than one area, fishing with more than one metier and have more than one landing date - the whole trip is allocated to the combination with most landings. First looking at metier and area in combination - and then date.

3.3 DFAD - Adding needed info

Area reference: Q:/mynd/SAS Library/Farvand/farvand.sas7bdat - ICES area codes.

lab reference: Q:/mynd/SAS Library/Lplads/lplads - Relating homeport to DTU Aqua labs.

Fleet reference: Q:/mynd/kibi/reference_tables/fleet/fleet.rds - Relating metier level 6 to a fleet.

3.3.1 Vessels without homeport

This is normally due to the fact that there are landings before/after the dates in the vessel regitre - **ask FST to check**

fid	oal_new
KA82	NA
RI44	NA
SG237	NA

4 Sampling frame

4.1 Main activity

Following the rules specified in section 2.1.1

```
## `summarise()` has grouped output by 'main_activity', 'sampling_frame'. You can override using the `.g
```

main_activity	sampling_frame	exclude_reason	no_vessels
gillnets	no	main activity	144
gillnets	yes	NA	520
non-gillnets	no	main activity	690

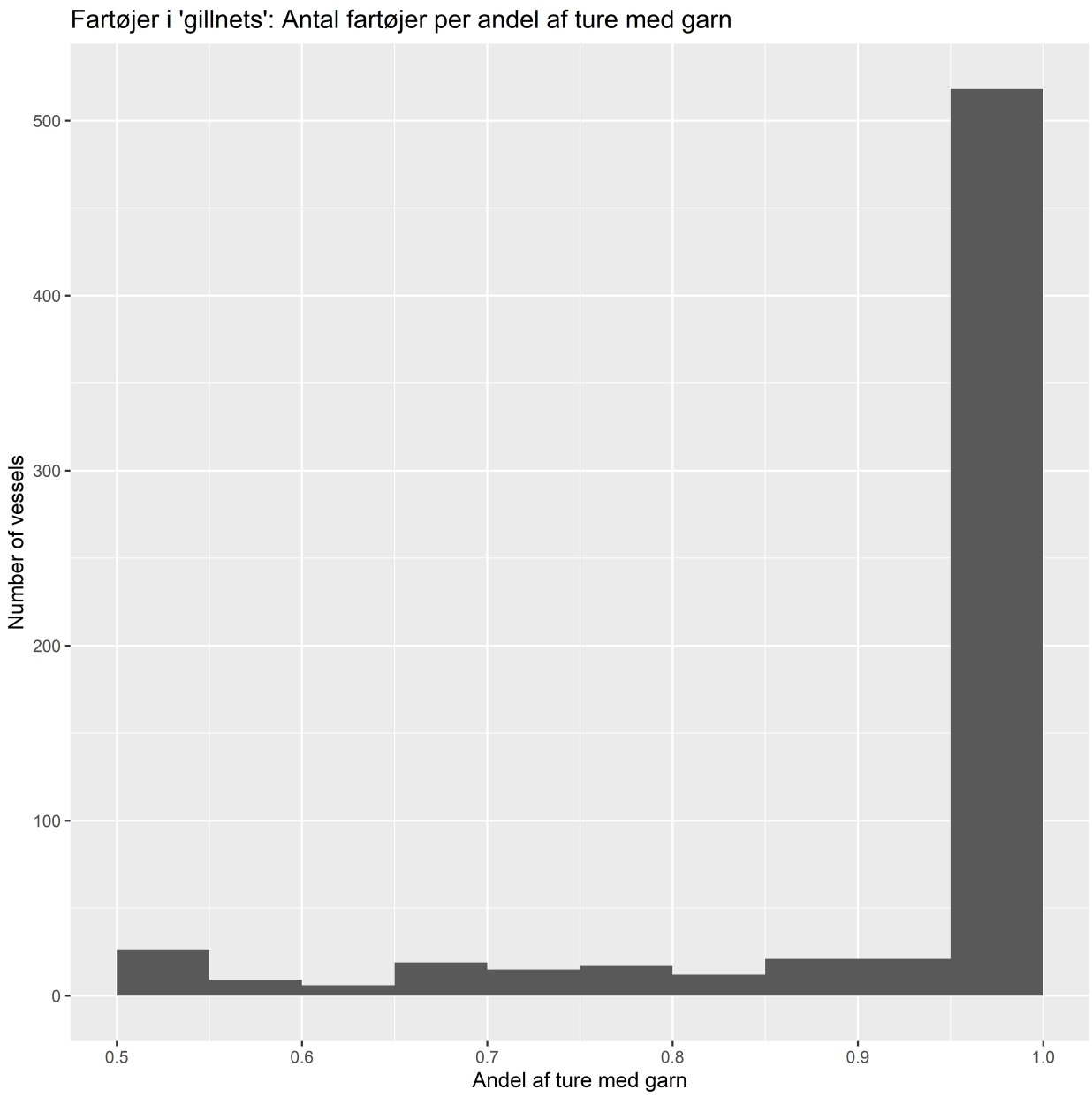
4.2 Removing vessels already in other lykkehjul

```
## `summarise()` has grouped output by 'main_activity', 'sampling_frame'. You can override using the `.g
```

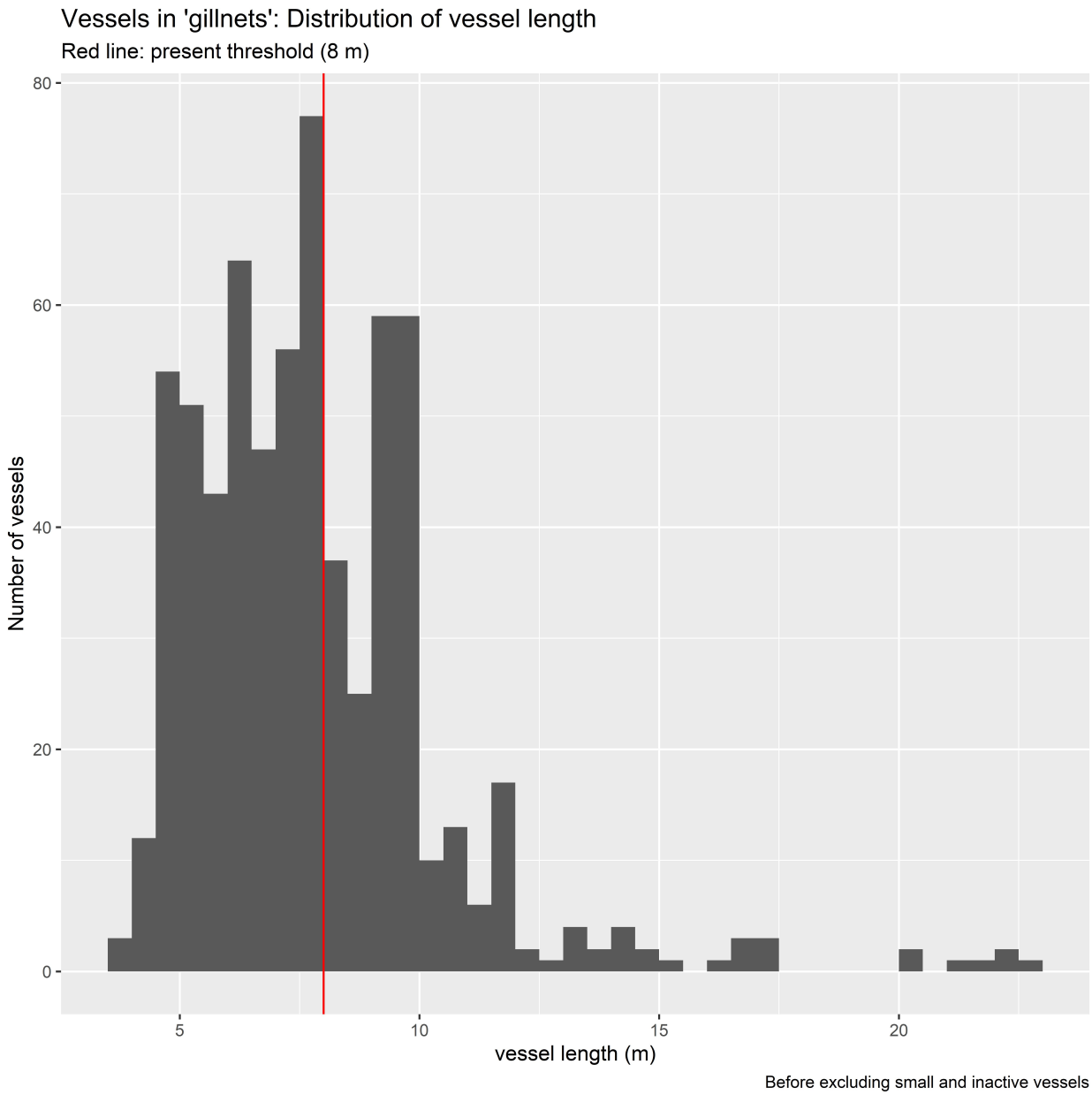
main_activity	sampling_frame	exclude_reason	no_vessels
gillnets	no	main activity	144
gillnets	yes	NA	520
non-gillnets	no	main activity	690

4.3 Main activity - 50% or 95%

Meeting 20200622 - we dicided on >= 95%


Fartøjer i 'gillnets': Antal fartøjer per andel af ture med garn
Number of vessels
500
400
300
200
100
0
0.5
0.6
0.7
0.8
0.9
1.0
Andel af ture med garn

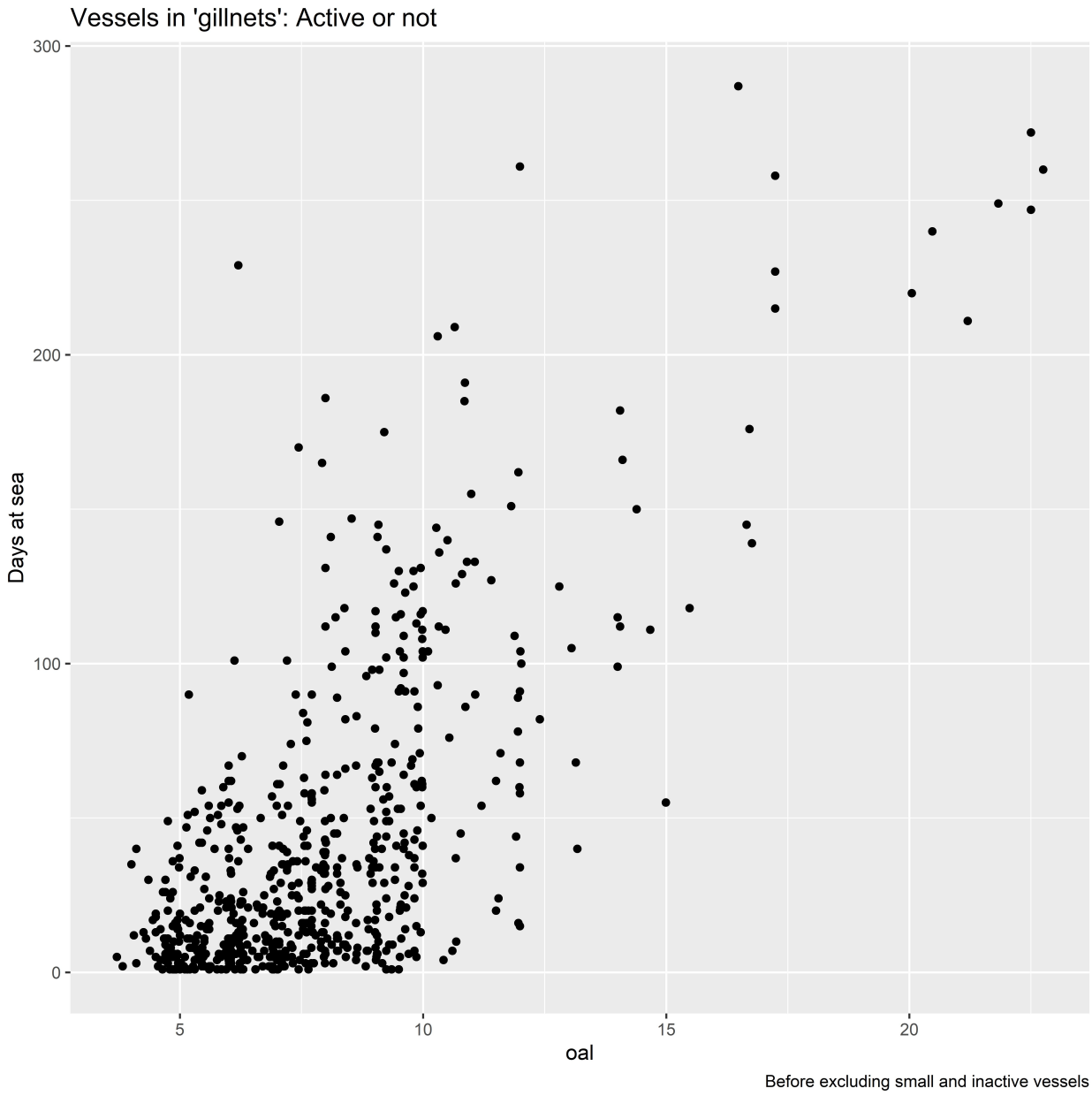
4.4 Too small



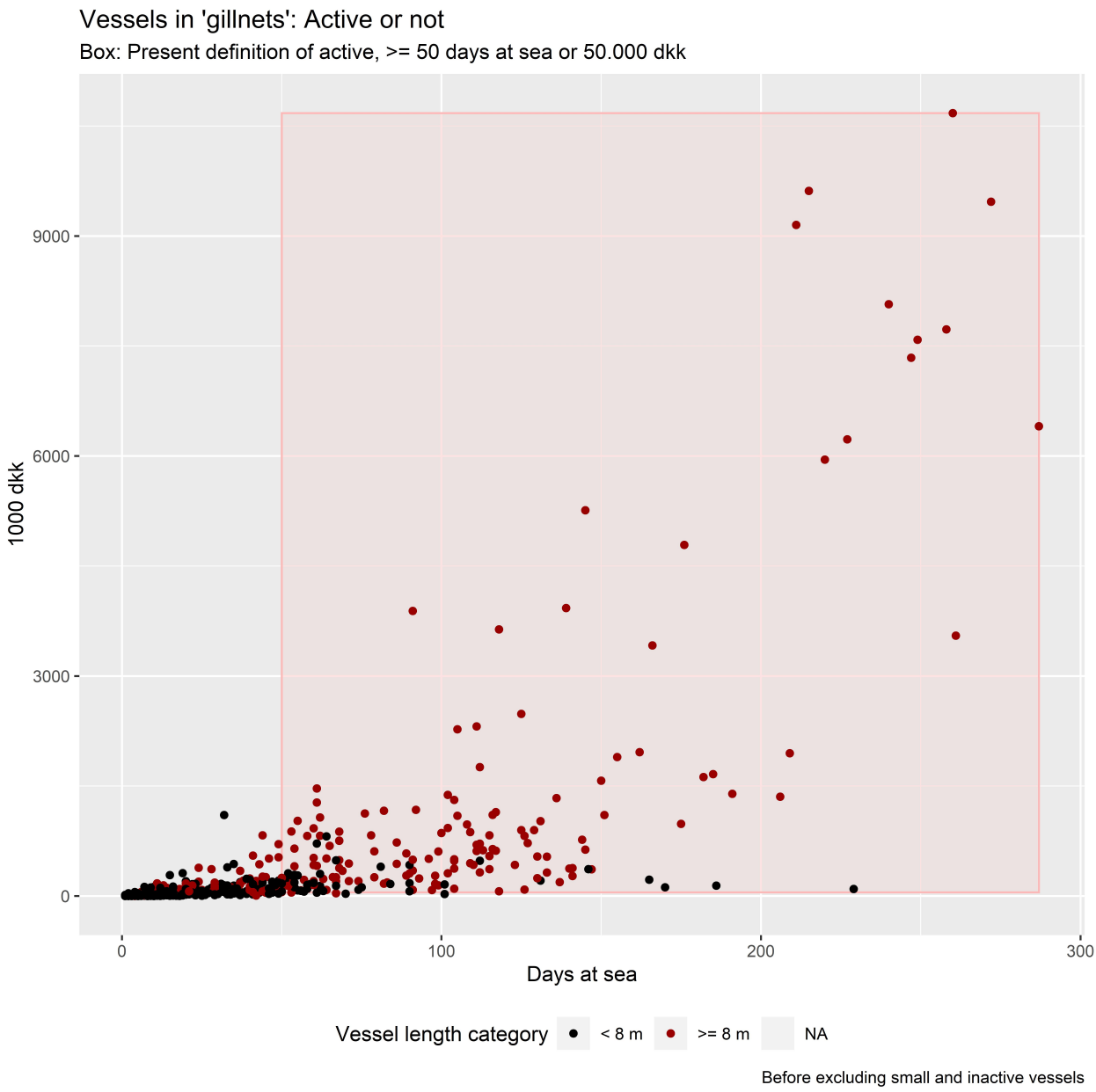
A tibble: 3 x 2 oal_mark no_vessel 1 <8 406 2 >=8 257 3 1

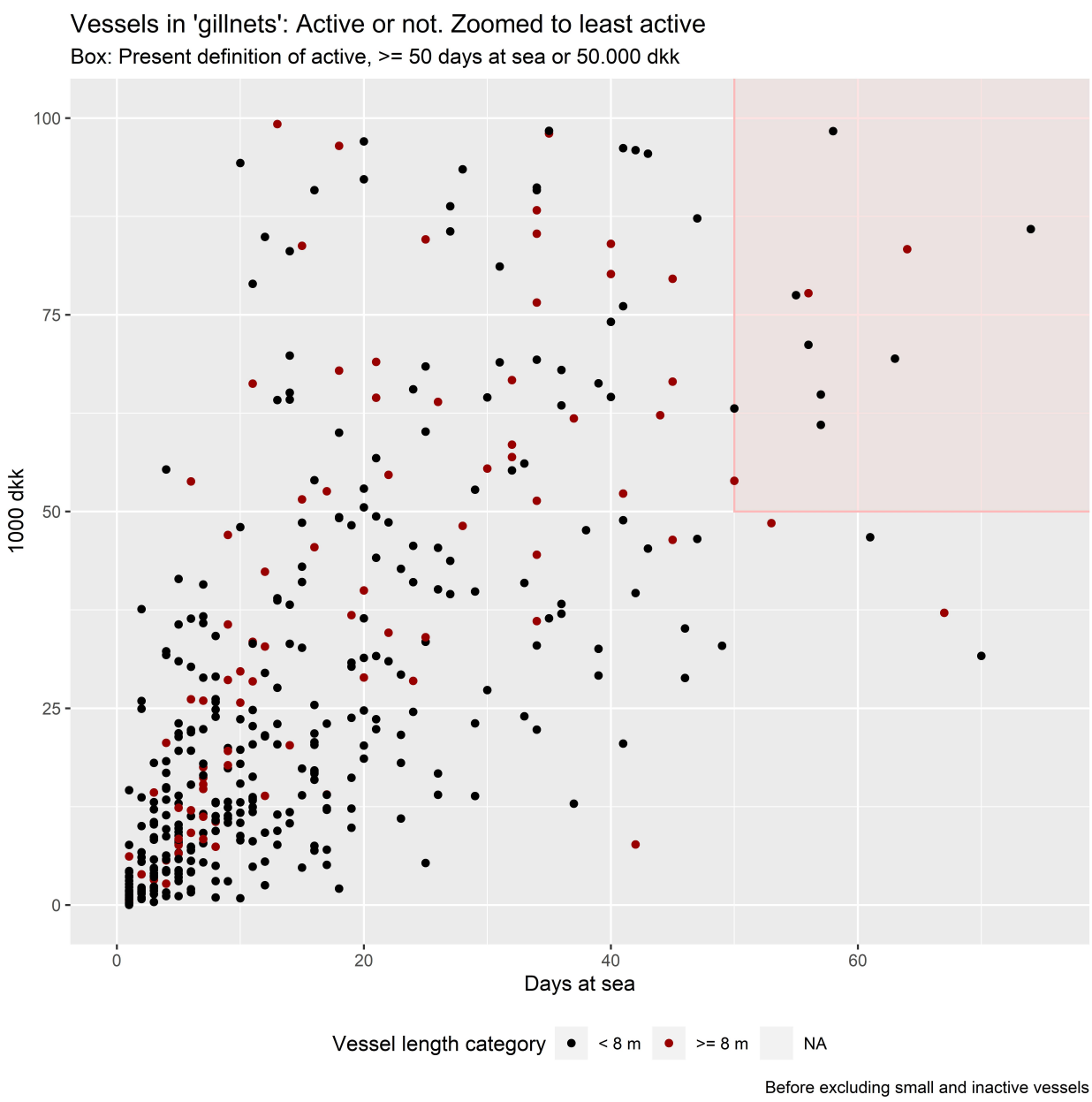
4.5 Inactive

```
## `summarise()` has grouped output by 'fid', 'match_alle', 'havdag_tur'. You can override using the `.g
## `summarise()` has grouped output by 'fid'. You can override using the `.groups` argument.
```




```
## `summarise()` has grouped output by 'fid', 'match_alle', 'havdag_tur'. You can override using the `.g
## `summarise()` has grouped output by 'fid'. You can override using the `.groups` argument.
```


Vessels in 'gillnets': Active or not
Box: Present definition of active, >= 50 days at sea or 50.000 dkk
1000 dkk
9000
6000
3000
0
0
100
200
300
Days at sea
Vessel length category
< 8 m
>= 8 m
NA
Before excluding small and inactive vessels




```
## `summarise()` has grouped output by 'main_activity', 'sampling_frame'. You can override using the `.g
```

main_activity	sampling_frame	exclude_reason	no_vessels
gillnets	no	< 50 days at sea	58
gillnets	no	< 50 days at sea & 50,000 dkk a year	43
gillnets	no	< 50,000 dkk a year	2
gillnets	no	main activity	144
gillnets	no	too small	305
gillnets	yes	NA	111
gillnets	NA	NA	1
non-gillnets	no	main activity	690

5 Stratification

5.1 Fleet

Following the rules specified in section 2.2.1

5.2 Location

Following the rules specified in section 2.2.2

strata_location	no_vessels
Hirtshals	62
Lyngby	49

5.3 Area

Following the rules specified in section 2.2.3

```
## `summarise()` has grouped output by 'strata_location', 'strata_fleet'. You can override using the `.g
```

strata_location	strata_fleet	strata_area	no_vessels
Hirtshals	gillnets	Kattegat	2
Hirtshals	gillnets	North Sea	24
Hirtshals	gillnets	Skagerrak	35
Hirtshals	gillnets	Western Baltic	1
Lyngby	gillnets		49

6 Output

6.1 Preparing the output

Added number of trips per quarter to sampling frame