Manual for video-based electronic monitoring of bycatch in gillnets

Revised 12/10/2021

Background

In Denmark, ensuring a favourable conservation status for air-breathing taxa vulnerable to bycatch in fishing gears is enacted by European Union (EU) legislations like the Habitats Directive (92/43/EEC), the Birds Directive (2009/147/EC), the Marine Strategy Framework Directive (2008/56/EC), the Regulation on the conservation of fisheries resources and the protection of marine ecosystems through technical measures (2019/1241/EU), or through international agreements like ASCOBANS (Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas). In addition, the European Commission adopted in 2012 the 'Action Plan for reducing incidental catches of seabirds in fishing gears' (2012/665/COM), which among other things requires Member States to minimise and, where possible, eliminate the bycatches of seabirds. These obligations together require EU Member States to estimate incidental bycatch of all birds, mammals, reptiles and fish protected under Union legislation and international agreements and assess the effects of these bycatches at the population level. Additionally, Member States are required to develop and implement measures to reduce fisheries bycatch. The original pilot project was not financed by the DCF program but was funded by the European Maritime and Fisheries Fund (EMFF).

Bycatches are generally rare events from the fisher's viewpoint, but their cumulative effect is susceptible to have detrimental consequences on affected top predator populations (e.g., marine mammals, seabirds, sharks, etc…). Nevertheless, in Denmark, fisher-reported logbook data are insufficient with regards to bycatch of PETS and fishing effort to reliably estimate bycatch rates and total bycatch, especially for the smaller length classes. Moreover, a bycatch data collection programme using fisheries observers can rapidly become prohibitively expensive in a high-waged country like Denmark, whereas electronic monitoring with video (EM) can provide high quality fisheries-dependant data for a fraction of the cost of observers. Therefore, to fill in the gaps, the collection of data on unintentional catches (or bycatch) of protected, endangered, and threatened species (PETS) in Danish commercial gillnets started as a pilot study in 2010 using video-based electronic monitoring (EM). This programme has been running without discontinuity ever since and, since 2020, it has been integrated to the national fisheries data collection framework.

Sampling design

Aim

DTU Aqua started a pilot project to collect bycatch data of vulnerable air-breathing species onboard Danish commercial gillnetters using video-based electronic monitoring (EM). The reason for this targeted sampling scheme was that gillnetters only in a smaller degree is covered in the standard observer program due to the relatively low discard level of fish species and it was therefore decided to have targeted program covering birds and mammals.

The EM bycatch data collection consists of recording the entire fishing activity of a representative sample of the commercial gillnet fleet using video-based EM systems and to analyse a census of the recorded EM data for unintentional captures of PETS.

Duration

The project started in 2010 and the data collection has been continuous ever since and 18 gillnetters have been monitored to date (2021), for periods spanning from several consecutive months to years. In the beginning of the project, only harbour porpoise incidental captures were monitored, later augmented with the registration of bycatches of seabirds and seals, both identified at species level. Since 2021, bycatch monitoring also includes the registration of elasmobranchs and chelonians trapped in gillnets.

Coverage Area

Since the beginning of the bycatch monitoring project, electronic monitoring data were collected in six ICES areas around mainland Denmark, but not around the island of Bornholm in the Baltic Proper by a total 18 commercial gillnet vessels (Figure 1).
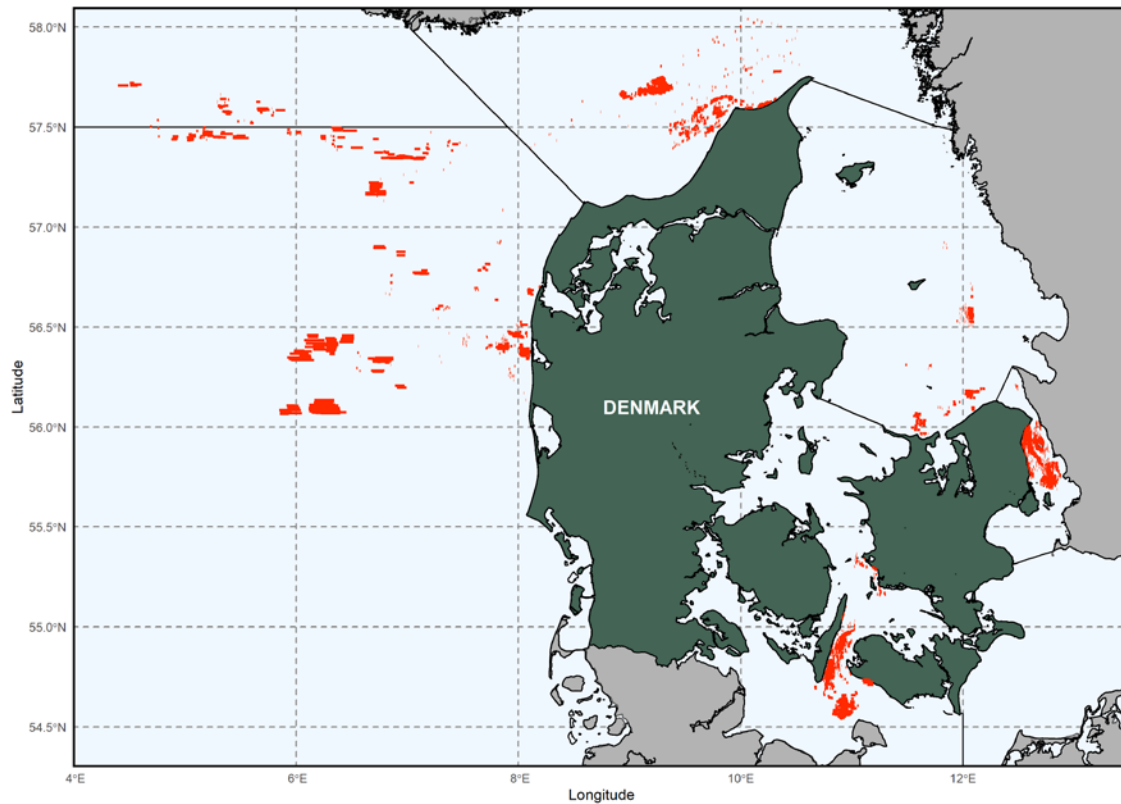
Figure 1. Location of the hauls recorded in the Danish bycatch monitoring programme, using electronic monitoring with videos on commercial gillnetters from 2010 to 2020. Observed hauls are represented as red lines. Delimitations between ICES areas are marked as plain grey lines.

Fleet selection

The proposition of monitoring their entire fishing activity using video-based EM systems is often met with reticence by fishers. To maximise the uptake of this technology in the Danish gillnet fleet, the participating fishing vessels were selected opportunistically and given a financial compensation *e.g.*, in the form of additional fishing quotas. Nevertheless, it was essential to cover the major gillnet fishing areas around Denmark to increase the representativity of the selected sample of vessels. Table 1 shows the number of vessels equipped with EM participating in the bycatch data collection per ICES statistical area per year.

Table 1. Number of commercial gillnet vessels participating to the Danish bycatch electronic monitoring programme from 2010 to 2020 per ICES area. Some vessels may be counted more than once in the same year, if they were fishing in different ICES areas that year.

ICES Area	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
3.a.20		2	2	1		1	2	5	4	4	3
3.a.21				1		1				1	1
3.b.23	1	2	2	2	2	1	3	2	2	2	2
3.c.22			1	3	4	3	3	2	2	1	1
4.a				1							1
4.b		1		1	1	1	1		1		1
Total	**1**	**5**	**5**	**9**	**7**	**7**	**9**	**9**	**9**	**8**	**9**

Data and methods

Two different EM systems were used to monitor the fishing activity and potential gillnet bycatch. Originally, in 2010, EM Observe (Archipelago Marine Research Ltd, Canada; http://www.archipelago.ca) equipped all participating vessels. From 2013, EM Observe was replaced with Black Box Video (Anchorlab, Denmark; http://www.anchorlab.dk/). Both EM systems were similar in terms of hardware, consisting of a central processing unit installed in the wheelhouse, integrating data from a position sensor (GPS) and a set of waterproof CCTV (Closed Circuit Television) cameras recording the activity on deck. Specifically, at least one camera was oriented outward to capture the footage of the net breaking the water surface during the hauling phase and at least one camera was placed above the sorting table to monitor target species catches and bycatch of non-target species.

Specialised software, specific to each EM system, were used to analyse the collected EM data. EM analysers displayed alongside the position of a vessel (on a map showing the GPS trace), the time of the day (on a timeline, which also indicated the instantaneous speed as a graph) and the video recordings from the different cameras. Data analysts were trained to identify fishing activity (net deployment and retrieval), as well as the bycatch of the species of interest (here, seabirds, harbour porpoise, seals, and elasmobranchs). The software offered the possibilities to vary playback speed according to video quality, to pause and replay video sequences at will and to zoom onto distinctive anatomical features, providing an effective platform for the identification of bycaught animals. Weather conditions, luminosity or potential sun flares could affect image readability, but also the general cleanliness of the camera lenses. Moreover, fishers could sometimes place themselves in the visual field in a way that made the identification process difficult. Nonetheless, the vast majority of bycaught animals could be identified from the video footage, down to species level. Glemarec *et al.* (2020) describes in details the methodology used to monitor bycatch in Danish commercial gillnets using video-based EM, with a focus on seabird bycatch.

Lessons learned

As a first step toward assessing the potential effects of bycatch on the population dynamics of non-commercial species, it is necessary to estimate total bycatch-induced mortality at fleet level for the impacted populations. These bycatch estimates may then be used as inputs in population models in order to predict the evolution of vulnerable populations under different scenarios (*e.g.*, Beest et al., 2017; Marchowski et al., 2020). DTU Aqua is currently working on processing EM bycatch data to estimate average fleet-wide mortality for harbour porpoise, grey and harbour seals, and several species of birds for which enough EM or observer data exist. Since the EM pilot project started in 2010, no chelonian was observed as bycatch in gillnets in Danish gillnets, so such an assessment will not be possible for species of that group. For elasmobranchs, the identification at species level from videos only started in 2021 and it will thus take some time before enough data are available for an assessment to be possible. Nevertheless, these groups of animals are also captured in other gear types than gillnets in Denmark, so a preliminary assessment of fisheries-induced mortality may be possible in the Danish fleet in a near future.

Inclusion into regular sampling

The monitoring of mammals, birds and elasmobranchs using video-based EM is in 2021 included as a targeted sampling program within the Danish DCF monitoring.

References

Beest, F.M. *et al.* (2017) 'Predicting the population-level impact of mitigating harbor porpoise bycatch with pingers and time-area fishing closures', *Ecosphere*, 8(4). doi:10.1002/ecs2.1785.

Glemarec, G. *et al.* (2020) 'Assessing seabird bycatch in gillnet fisheries using electronic monitoring', *Biological Conservation*, 243, p. 108461. doi:10.1016/j.biocon.2020.108461.

Marchowski, D. *et al.* (2020) 'Fishery bycatch is among the most important threats to the European population of Greater Scaup Aythya marila', *Bird Conservation International*, 30(2), pp. 176–193. doi:10.1017/S0959270919000492.

ANNEX 1: EM Analysts manual

Anchorlab develops and maintains BlackBox Analyzer, a sofware designed to collect, analyze and extract EM data (https://www.anchorlab.net/EFM.aspx?tab=Analyzer). Anchorlab edits a user guide, which is regularly updated (https://www.anchorlab.net/EFM.aspx) and should be refered to for general use.

This guide is a handbook targeted at EM analysts working in the Danish bycatch monitoring programme which describes the specificities of the Danish monitoring programme for the collection of PETS interactions with commercial fisheries using the BlackBox Analyzer software, and comes as a complement of individual training.

Login screen

Log into the sofware using the credentials (Username and Password) received from the project administration.

Start page

The start page shows the most recent data uploaded to the server. On the left side, you can choose the specific vessel you wish to work with. This way, you can make sure you only see data from that specific vessel.

Default settings

The default setting only lets you see the latest 100 days of data. Open "Søg & Filter" ("Search & Filter"), and change the number to e.g. 1500 or 2000 days (or trips).
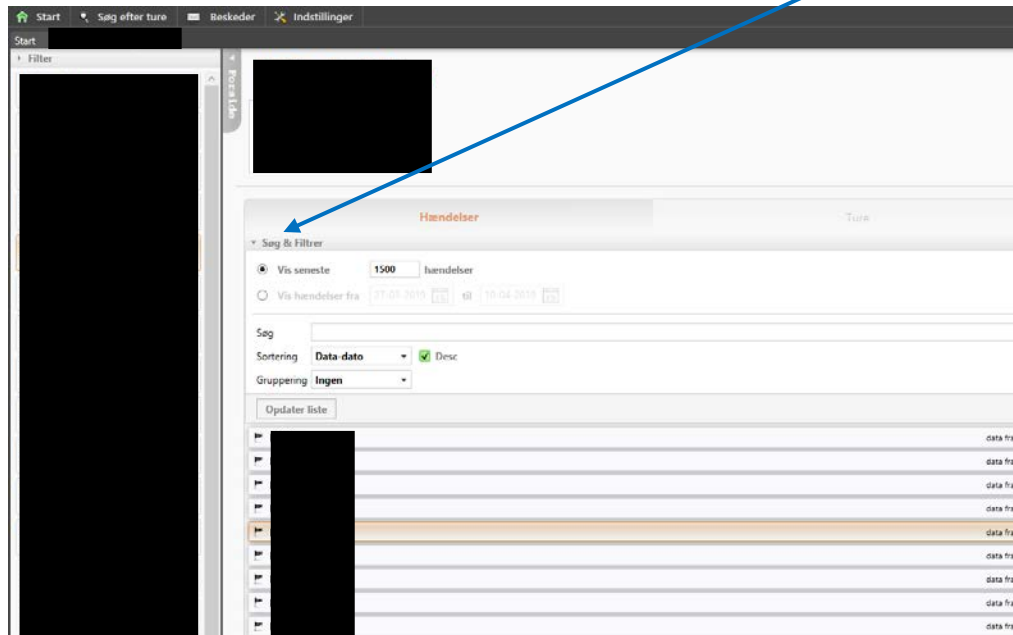
Trip selection screen

After choosing a specific vessel, you will only see in the middle of the screen the list of all the data received from this vessel.

The left column indicates the name of the vessel.
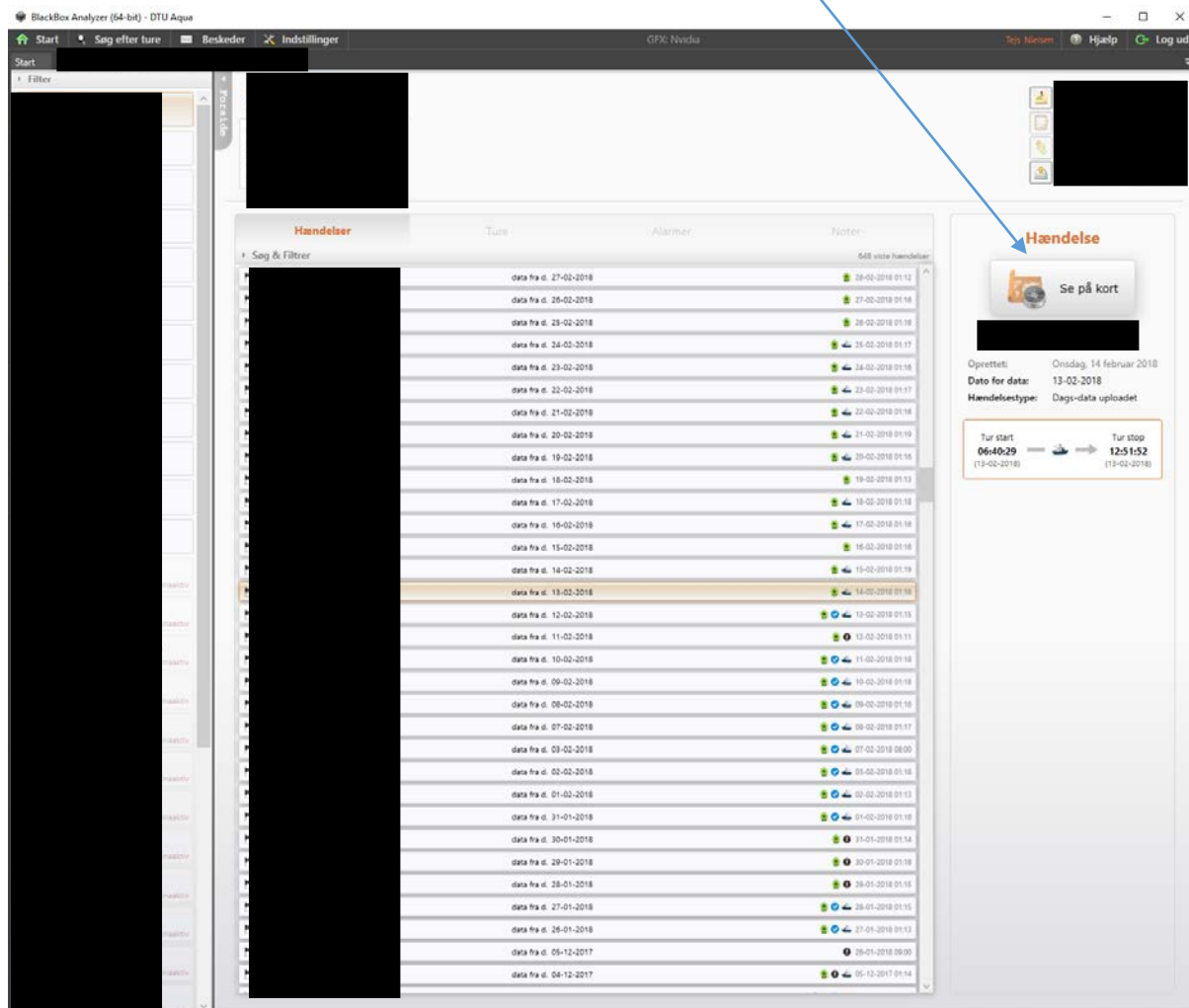**The middle column** contains the date, which should be written in the excel sheets.
The right column has information about what happens on the date with different logos.

Hændelser	Ture	Alarmer	Noter
▸ Søg & Filtrer			668 viste hændelser
▶	data fra d. 28-10-2018		29-10-2018 10:00
▶	data fra d. 27-10-2018		29-10-2018 09:59
▶	data fra d. 26-10-2018		29-10-2018 09:59
▶	data fra d. 25-10-2018		26-10-2018 02:04
▶	data fra d. 24-10-2018		25-10-2018 01:15
▶	data fra d. 23-10-2018		24-10-2018 01:14
▶	data fra d. 22-10-2018		23-10-2018 01:17
▶	data fra d. 21-10-2018		22-10-2018 01:17
▶	data fra d. 20-10-2018		21-10-2018 01:12
▶	data fra d. 19-10-2018		20-10-2018 01:11
▶	data fra d. 18-10-2018		19-10-2018 01:15
▶	data fra d. 17-10-2018		18-10-2018 01:13
▶	data fra d. 16-10-2018		17-10-2018 01:18
▶	data fra d. 15-10-2018		16-10-2018 01:16
▶	data fra d. 14-10-2018		15-10-2018 01:11
▶	data fra d. 13-10-2018		14-10-2018 01:15
▶	data fra d. 12-10-2018		13-10-2018 01:15
▶	data fra d. 11-10-2018		12-10-2018 01:29
▶	data fra d. 10-10-2018		11-10-2018 01:03
▶	data fra d. 09-10-2018		10-10-2018 01:03
▶	data fra d. 08-10-2018		09-10-2018 01:03
▶	data fra d. 07-10-2018		08-10-2018 01:02
▶	data fra d. 06-10-2018		07-10-2018 01:02
▶	data fra d. 05-10-2018		06-10-2018 01:02
▶	data fra d. 04-10-2018		05-10-2018 01:02
▶	data fra d. 03-10-2018		04-10-2018 01:02
▶	data fra d. 02-10-2018		03-10-2018 01:02
▶	data fra d. 01-10-2018		02-10-2018 01:02
▶	data fra d. 30-09-2018		01-10-2018 01:02
▶	data fra d. 29-09-2018		30-09-2018 01:01
▶	data fra d. 28-09-2018		29-09-2018 01:23
▶	data fra d. 27-09-2018		28-09-2018 01:15

Logos/symbols meanings

- A boat indicates that the vessel has left the harbour
- The green camera symbol = video is present
- The grey camera symbol = no video (it exists but has not been uploaded yet, or it has been deleted)
- The blue check-symbol indicates that this date has been checked and that it is a day with gillnet fishing.
- The black symbol indicates that this date has been checked and that it is a date without gillnet fishing

Mark a date that you want to look at and click on the "Se på kort" ("View on map") button in the top right corner to open the data of that date.
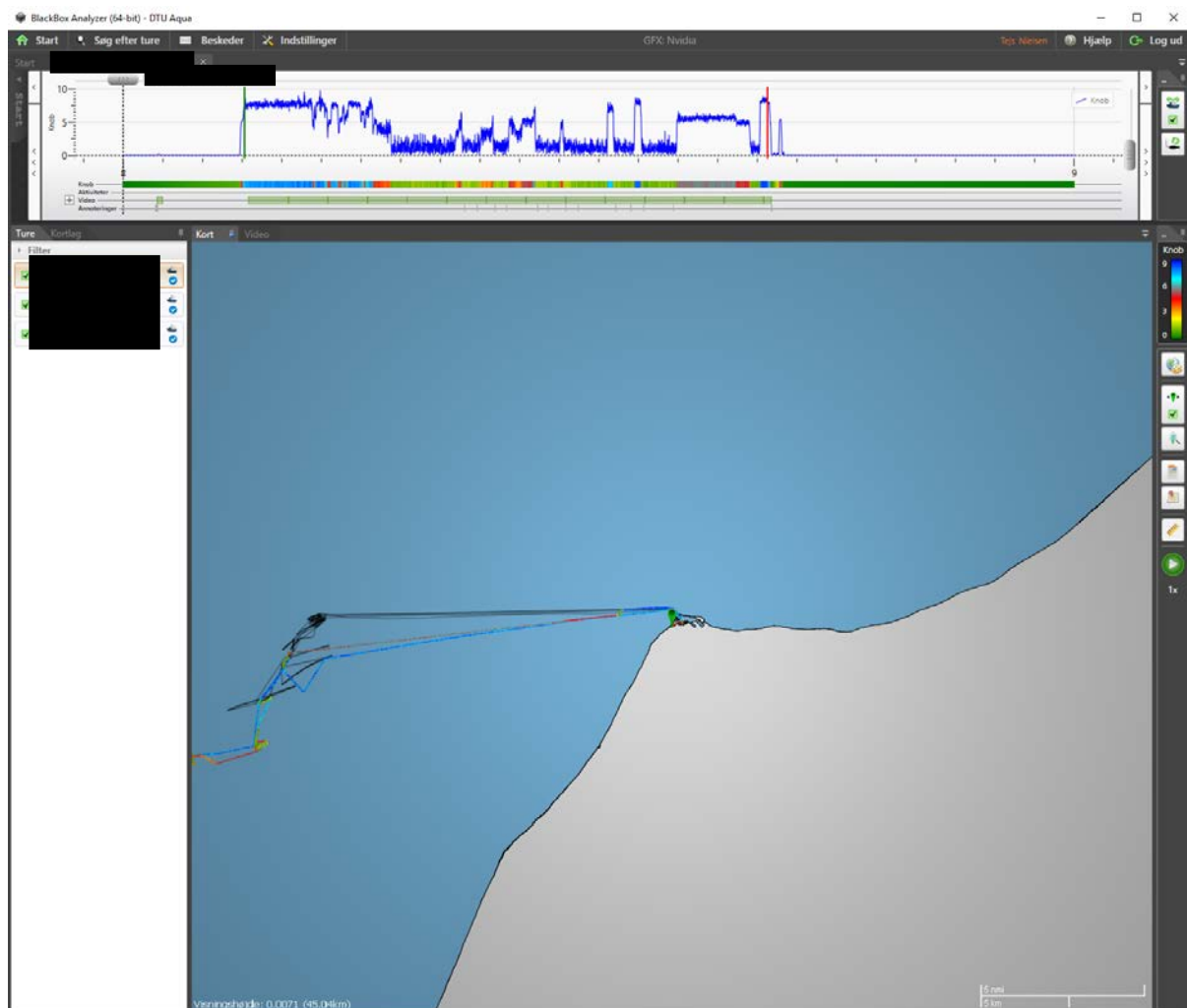
Trip analyzer screen: Map view

Once the data from a specific day is open, the layout looks like the following:
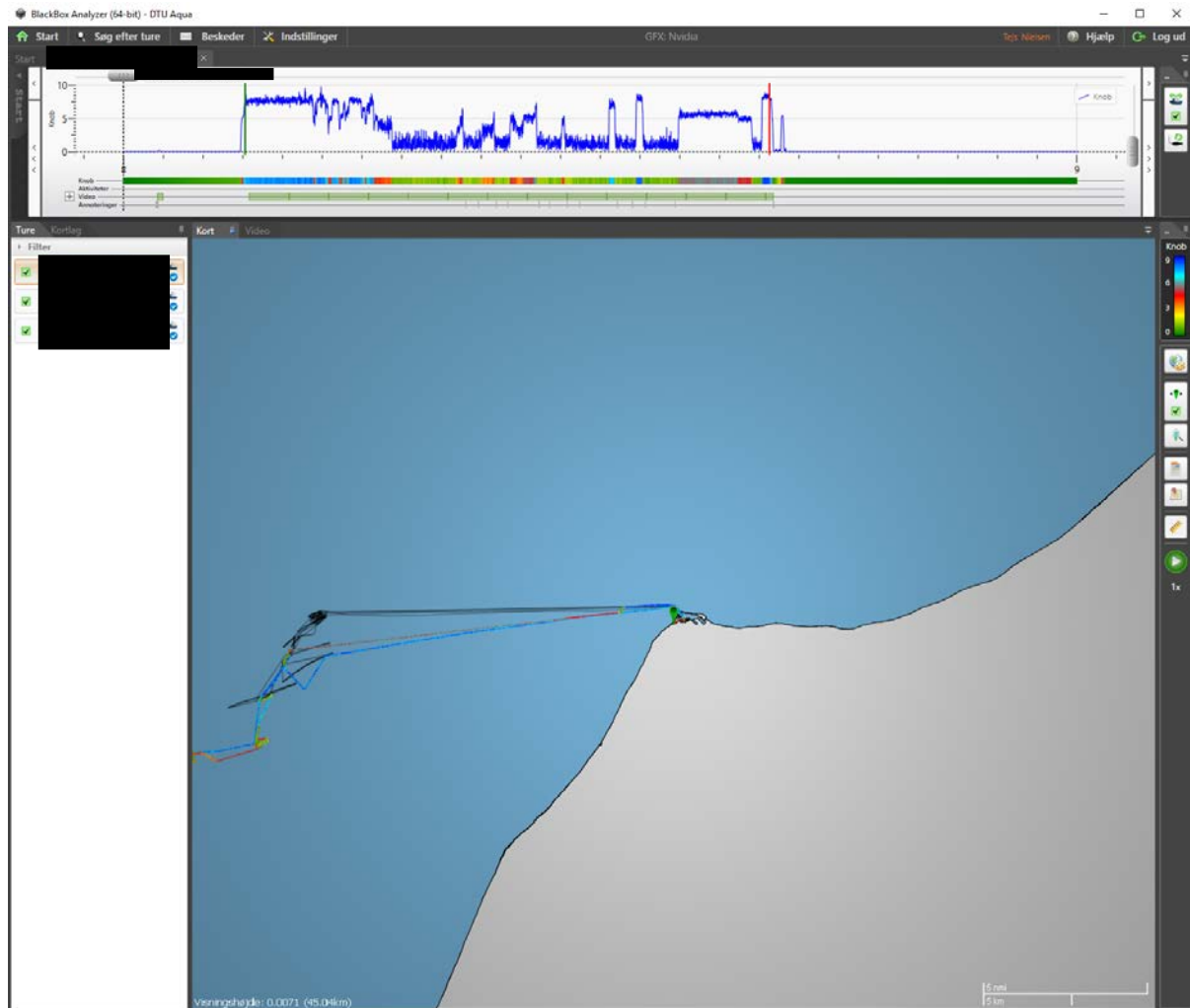
- In the left column, next to the map, you can choose which date to watch.
- Days not chosen will still be shown as shadows lines in the background. These can be removed by unchecking the boxes.
- The layout of the map can be changed above the dates. Here, you can apply certain layers to the map e.g., Restricted areas.
- By using the scroll function on the mouse, it is possible to zoom in and out on the map, as well as on the top panel (with the blue speed line and the colours).
- There are several additional tools available on the right side of the map that can be helpful. Read more about these in the BlackBox manual.
- It is possible to add filters/layers to the map by clicking on the "**Kortlag**" ("**Layers**") button located just above the days on the left side. Read more about this in the BlackBox manual.

- The map shows the coordinates of the vessels on the selected date/dates.
- The grey pin can be used to choose at what time of the trip you wish to watch.
- The speed is shown in two ways: A blue line indicating speed (knob/knots) by height, and a bar below the blue line indicating speed (knob/knots) by colour (slow → medium → Fast). The coloured speed bar matches the tracking line of the vessel on the map.
- The video bar indicates that video is present at the given time.
- The bottom bar ("**Anmodninger**" or "**Annotations**") contains all annotations.
- The green marker ( ) on the map is linked to the grey pin (in this case in the harbour) and shows the location of the vessel at any given time.

Trip analyzer screen: Video view

When opening the video tab, the layout looks like this.

- There are usually two cameras (1 showing the outside, and 1 showing the inside of the gillnet), but this can vary from vessel to vessel. The cameras are linked to the grey pin.
- Above the video-windows, the camera names are shown (cam0, cam1, cam…). You can choose which camera are showing video here, by checking/unchecking, or simply by double clicking on the video frame you wish to enlarge.
- To zoom in on the cameras simply scroll in on them with the mouse.
- The placement and size of the cameras can be changed on the ⊕ buttom, right of the camera names.
- At the bottom, you can select the watching-speed on the ◀◀ ▶▶ buttons and play/pause of the video on the ▶ button (this is easier with key bindings / using the keyboard, see the manual for more details on how to set it up).
- You can move back and forth frame by frame, using the keyboard up and down arrows.
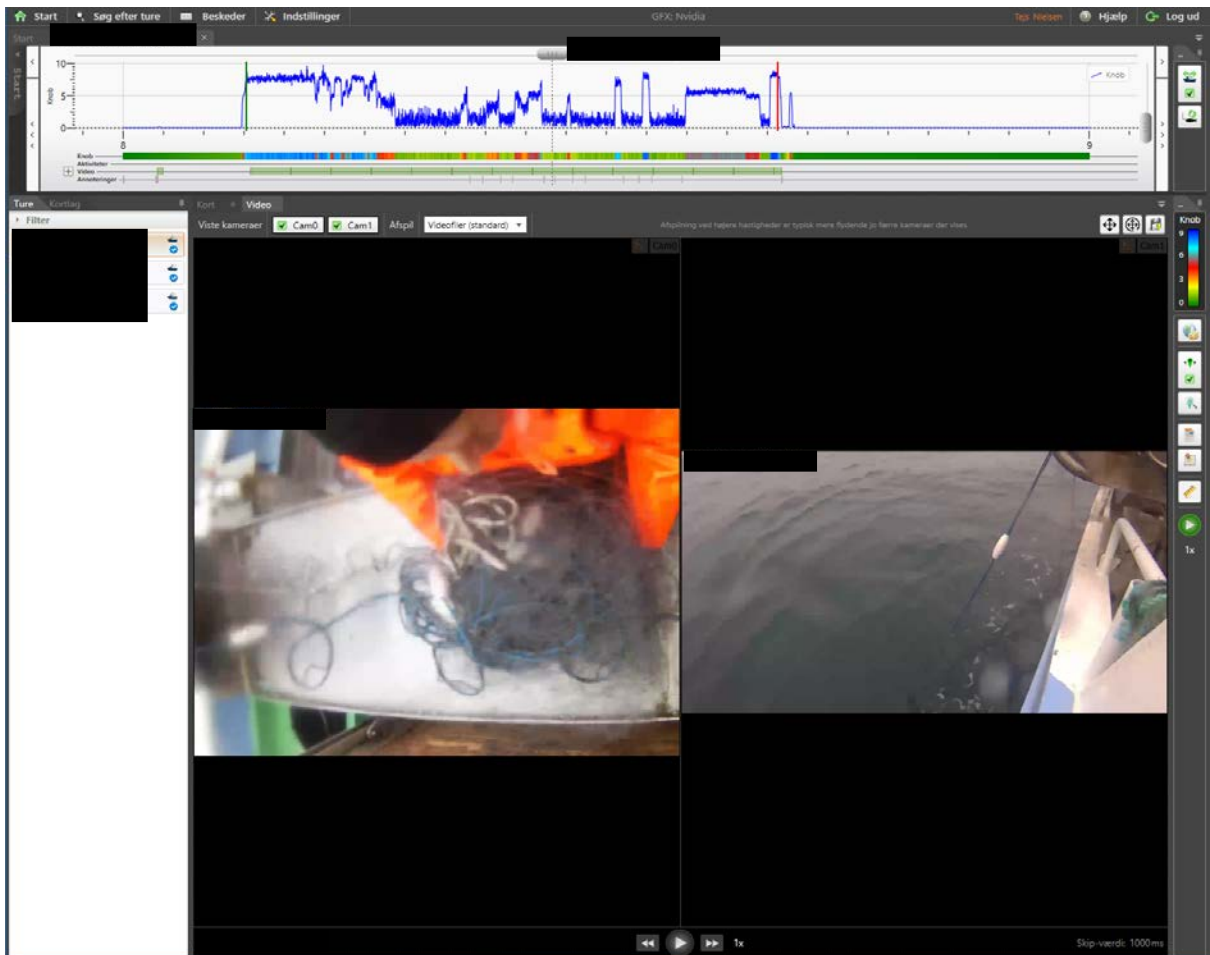
NB: You can zoom in on the cameras by using the scroll function on the mouse.

It is important to make annotations at the right moments, as this is usable data, and ensures that the data is easily controlled. Make sure to place the annotations as precise as possible, the annotation is placed where the grey pin is. Annotation categories are colour coded and symbolize different scenarios. To create a new annotation, press "CTRL+n", then select the desired type between:

- Anchor 1 (palegreen) marks the start of setting a net.
- Anchor 2 (Lightsalmon) marks the end of setting a net.
- Andet (orange) is used for anything you find worth mentioning, use it as a note.
- Bird (blue) marks a bycaught bird (**1 annotation per bird caught**)
- Mammal (black) marks a bycaught mammal (**1 annotation per mammal caught**)
- Pinger (yellow) marks a pinger.
- Plastic (purple) marks any type and size of plastic (**1 annotation per piece of plastic**)
- Seal damage (pink) marks fish damaged by seals (**1 annotation per seal damage caught**)
- Start (green) when the net hauled emerge from the water.
- Stop (red) marks when the last of the net hauled enters the boat.

Feel free to write anything relevant to that particular annotation in the note box, e.g., write "bird falls out of net", in the bird (blue) annotation if this is the case.
For general notes use the "**Andet**" (orange) annotation e.g., "he caught a shark".

You find the different types of annotation **here** (the colour of the annotation is preset and will show when you select the type of annotation – remember: DO NOT select colour, but type), and annotations will be shown in the bottom of the panel section.
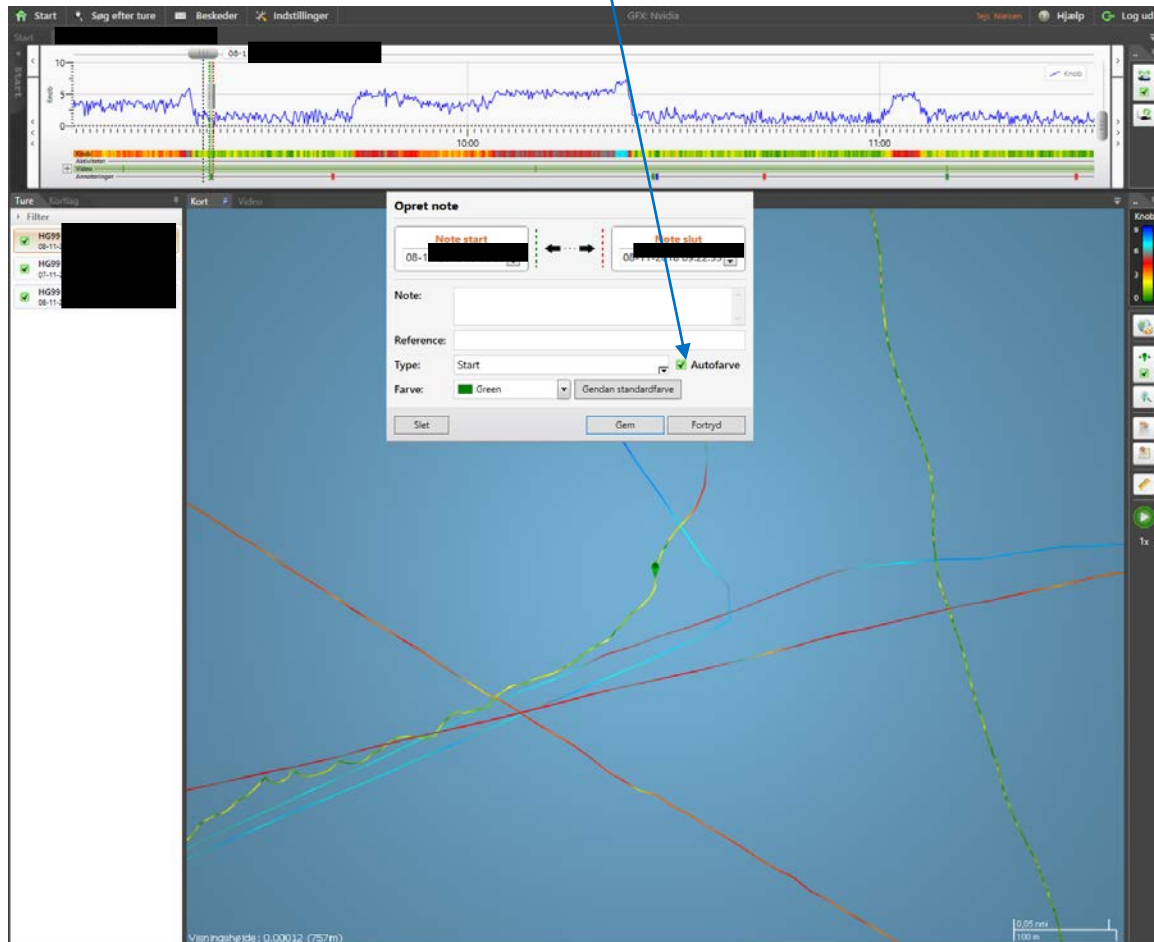
NB: there might be other annotation types than mentioned above, but do not use them.

Hauls are usually easy to spot, as they have a distinct pattern on the blue line (speed / knob) (individual for vessel and season).
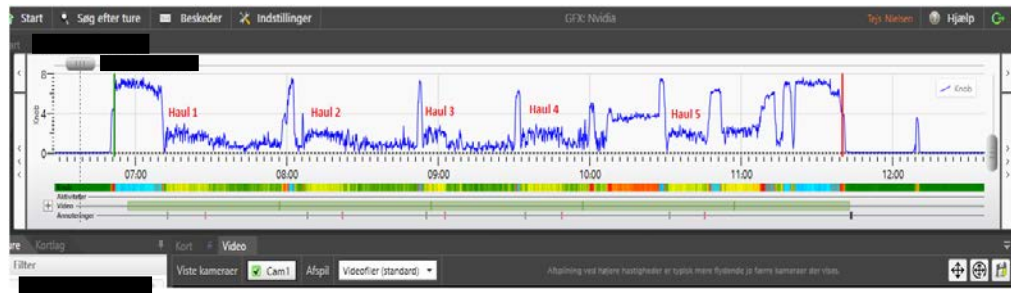
- When you have detected a possible haul, you check on the video to ensure that it is a haul.
- Then mark the start of the haul with the "**START**" annotation when the net emerges from the water (see picture below).
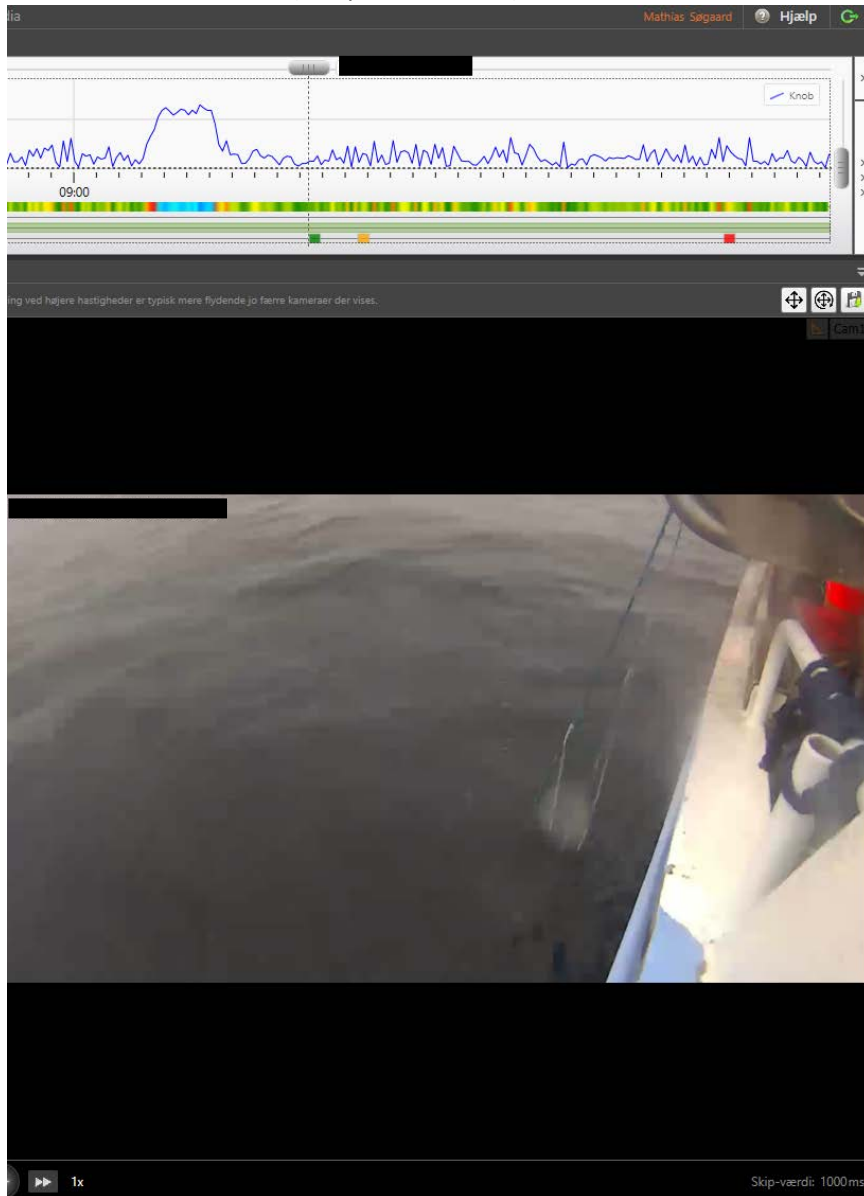
When the net has been hauled, mark the end of the haul with the "**STOP**" annotation, as the last part of the net leaves the water.
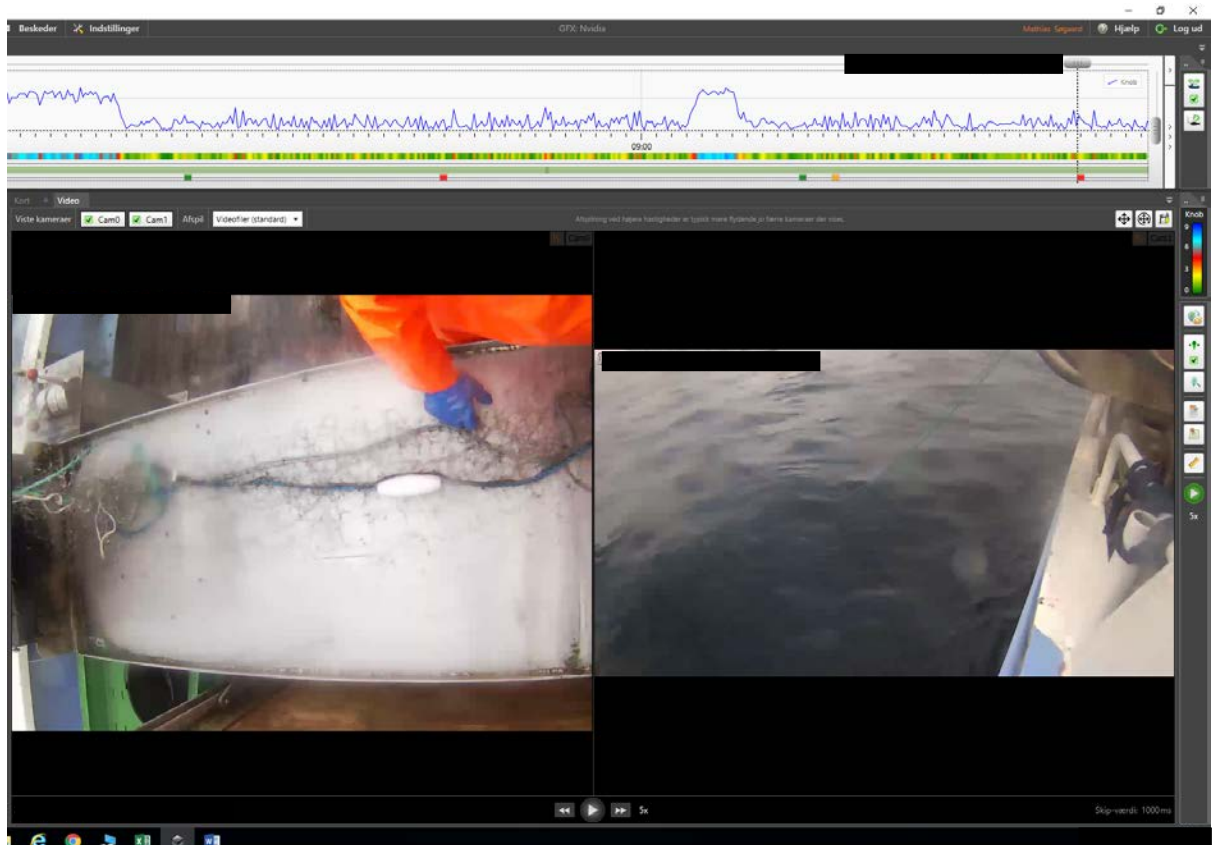
- In cases where there is no video, it is still possible to mark the hauls and sets. This is done by recognizing the specific haul and set pattern, of the vessel.
- Here it is possible to set the 5 hauls, without watching the video!
- In these cases, make sure to write *estimated* in the annotation note box, and in the column "comment" in the excel sheet.
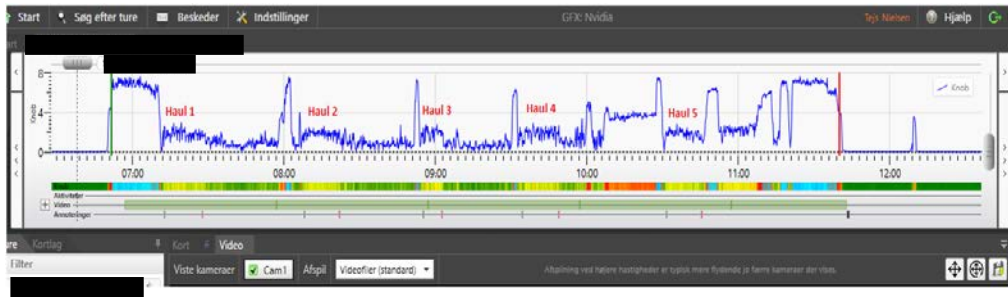
NB: You need experience and also to be familiar with the specific vessel to be able to recognize sets and hauls without video.

Identifying and marking the setting of nets with "**Anchor1**" and "**Anchor2**" uses the same principles as marking the hauls:

- Find a possible setting of net, and verify with video if possible (e.g., the fisherman throwing an anchor or buoy into the water or going to the back of the vessel several times).
- Use the "Anchor1" annotation when the first anchor is thrown in the water, and "Anchor2" annotation when the last anchor is thrown.
- If there is no video, make sure to write *estimated* in the note box of the annotation, and in the column "comment" in the soak time excel sheet.
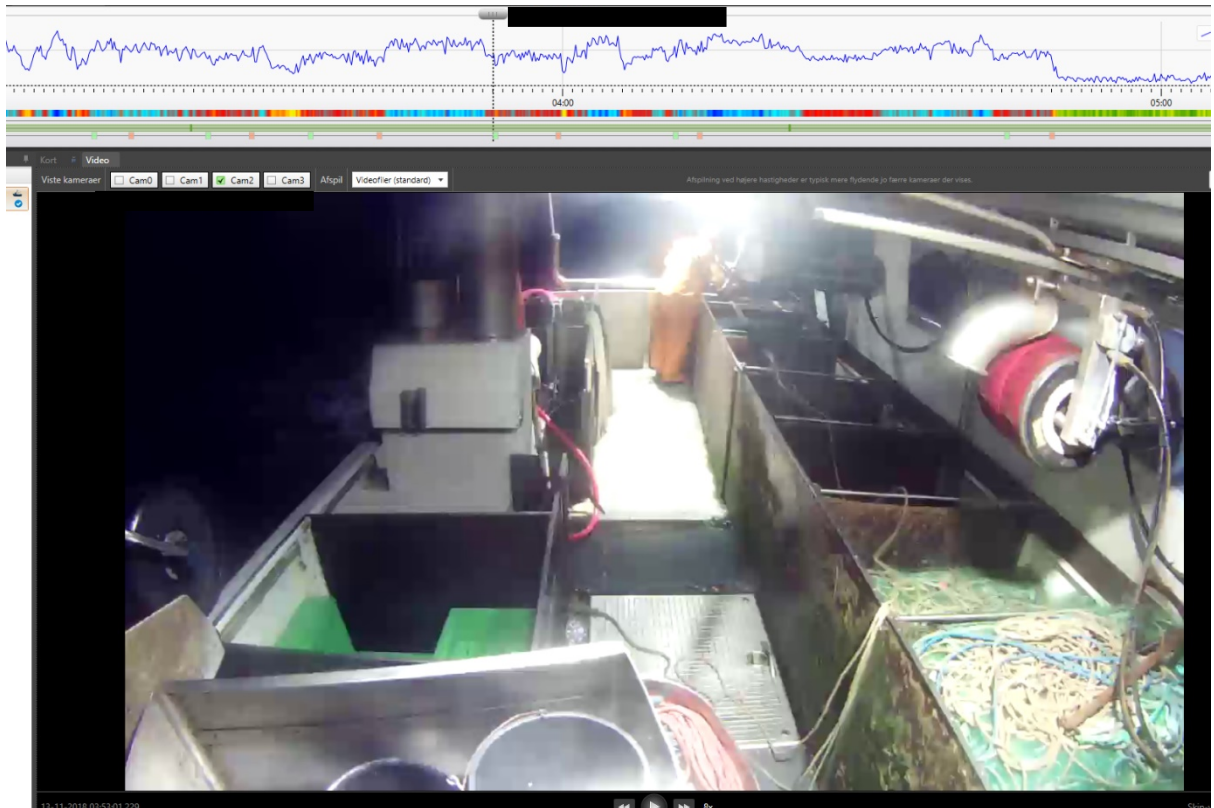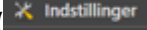
NB: You need experience and also to be familiar with the specific vessel to be able to recognize sets and hauls without video.

- When all the video has been watched and all annotations are placed, you need to mark that the date has been watched. This is done by clicking on the notepaper ▣ on the right side of the screen.
- If there was hauling of gillnets on the trip, and you have watched it all, you give the status: "**Datakvalitet godkendt**" ("**Data quality approved**") and the date will receive a blue checkmark.
  - You then write your initials, and "OK" in the note box, as well as with any important information e.g., *bycatch caught* (as shown on the picture, the specific species of bycatch is not required).
- In cases with no hauling of gillnets, you give the status: "**Andet**" and the date will get a black exclamation mark.
  - You write your initials and NF or No Fishing in the notebox.

<mark>NB: In cases with no video or no GPS, always mention this in the notebox.</mark>
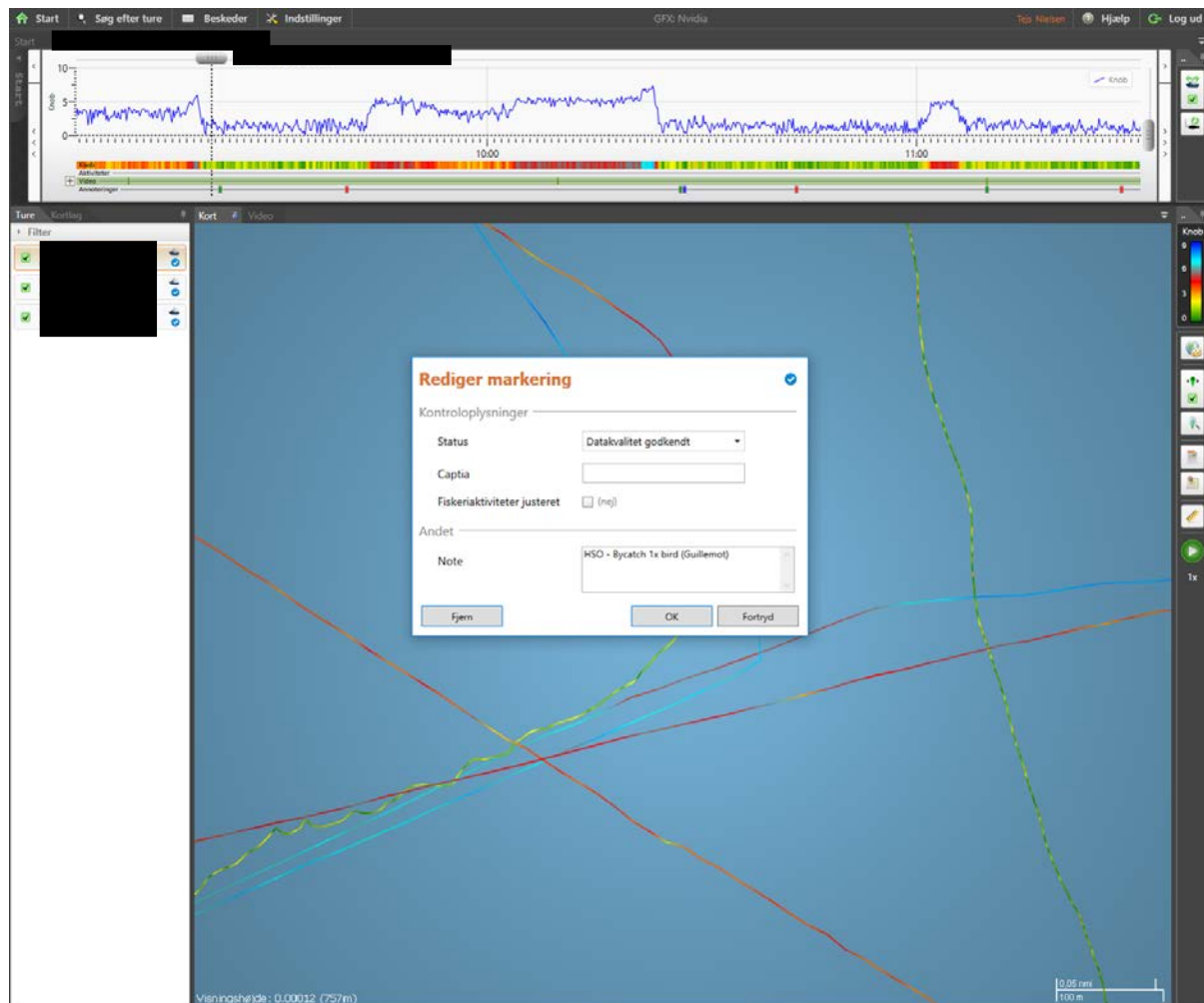
To change the setting of your BlackBox user profile, go to "**Indstillinger**" (⚒ Indstillinger , or "**Settings**") in the top of the screen. You primarily only make changes in the "**Generelt**" section ("**General**"), and you can modify key bindings in the "**Genvejstaster**" section ("**Shortcuts**").

In "**General**", you can change the standard interval for annotations, which should be 30 seconds. This will also change the length of the annotation marks on the graph.
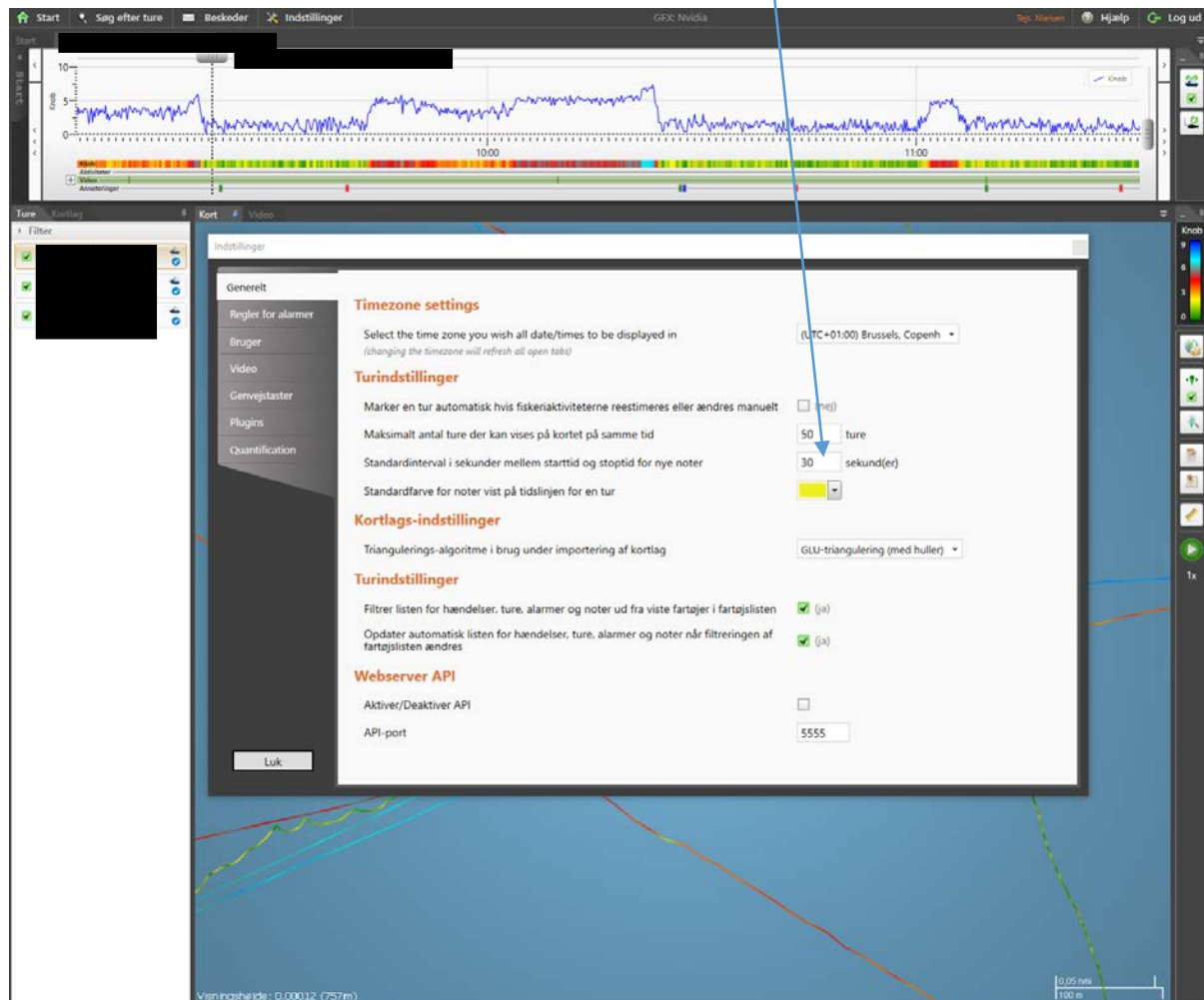
In "**Shortcuts**" ("**Genvejstaster**") you can change the key bindings to fit how you prefer it. Whether you want to start and stop the video on "space bar", or if you want to go back and forth or change the video speed on the arrow keys or on "WASD".
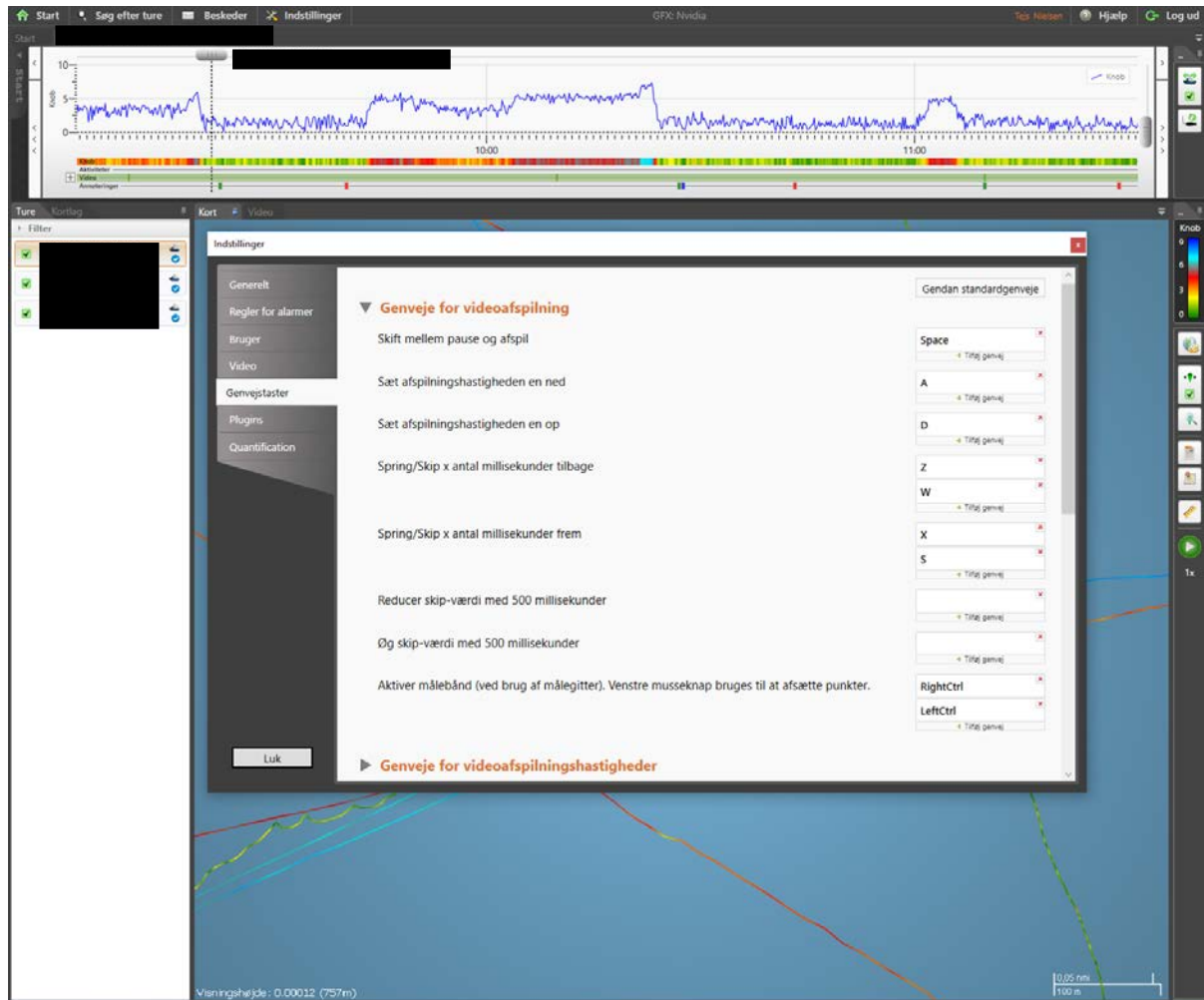
Remember to write all data into the correct excel sheets (bycatch or soak)

Notes for writing data into Excel

General rules for all columns

NO spaces allowed!*

NO CAPITAL letters are allowed – only **small** letters!*

*Capital and spaces are allowed in the **comment column** and ONLY here!!!

If you are in doubt about anything, ASK!!! Either by mail or in person.

Name
Simply write your given initials, so that it is known who has written the data e.g., TGN or HSO.

Date
This is the date of the trip and is written day-month-year e.g., 16-03-2018 (the 16th of March 2018)
If you are writing in the date from the "**Start**" tab, make sure you use the date in the middle. The date on the right is when the data was received in Blackbox.

Haul number (haul – in excel)

There might be several hauls in a day, so write the haul number e.g., 1, 2 or 3 etc.
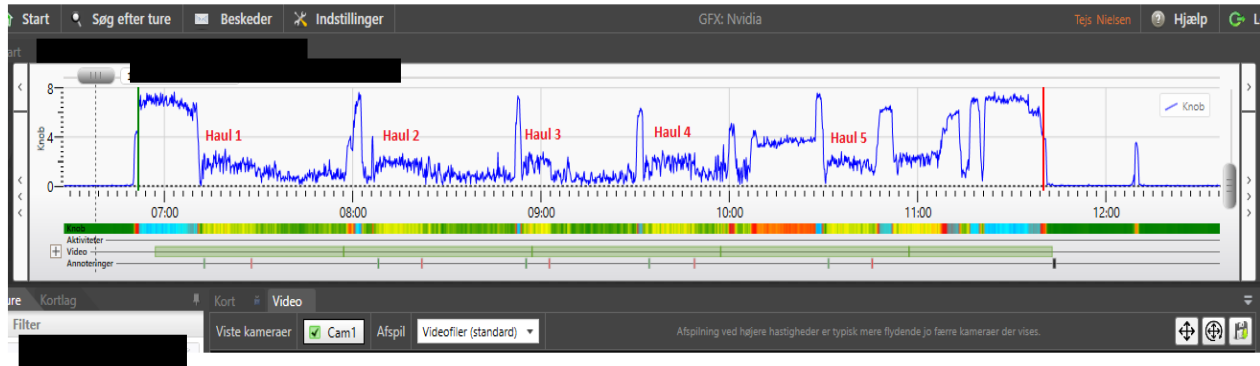
OBS!! Hauls are numbered by date **NOT** by trip, so the date of the haul can shift in a trip, just as the red and green haul in the picture below.
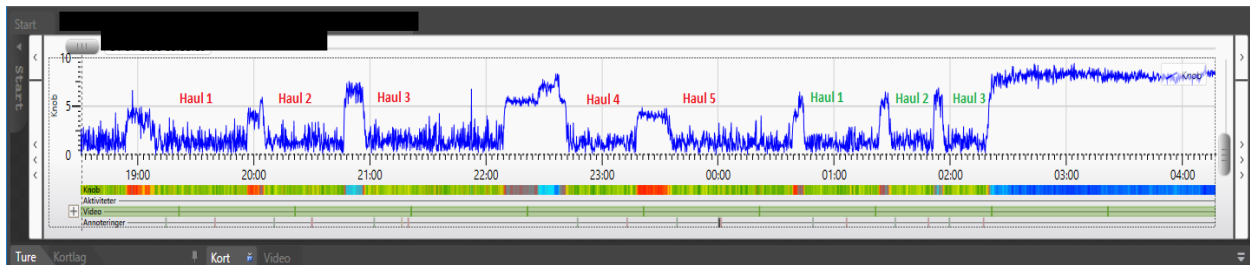
In cases with no gillnet fishing on the date, there should be written NF = no fishing, and all other columns should be NA except for GPS, which is still 1 = present 0 = not present.
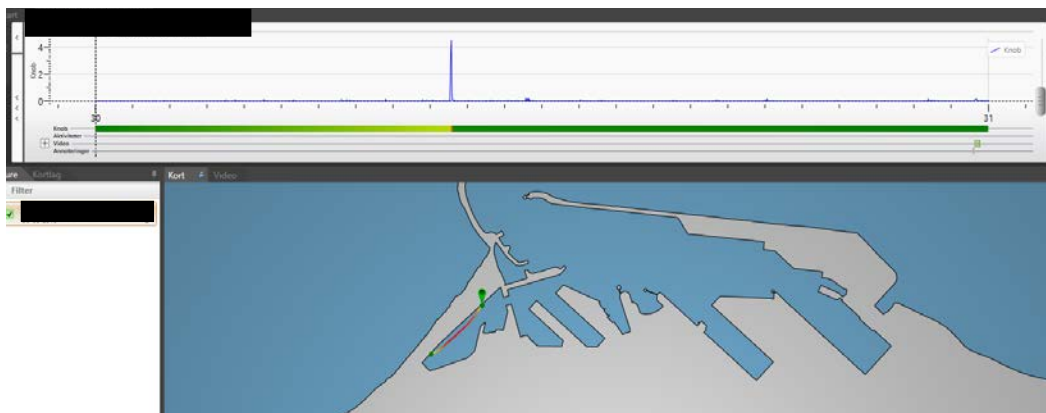
In cases with no video on the date, but with GPS present, it is possible to estimate hauls and setting of nets via the GPS. The number of hauls should be written as normal.
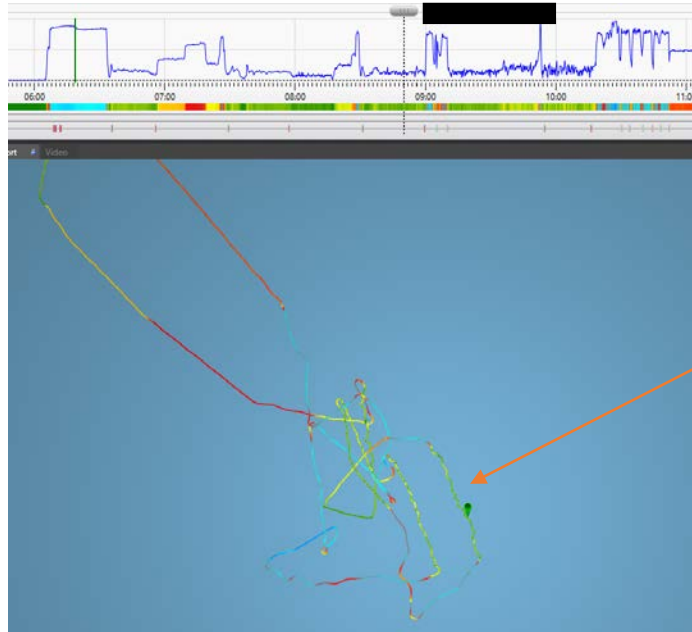
This is a haul based on the speed shown by the GPS, there is no video.

In cases with no video and no GPS on the same date, there should be written ND = no data, and all other columns should be NA with the exception of GPS, which is 0 = not present.
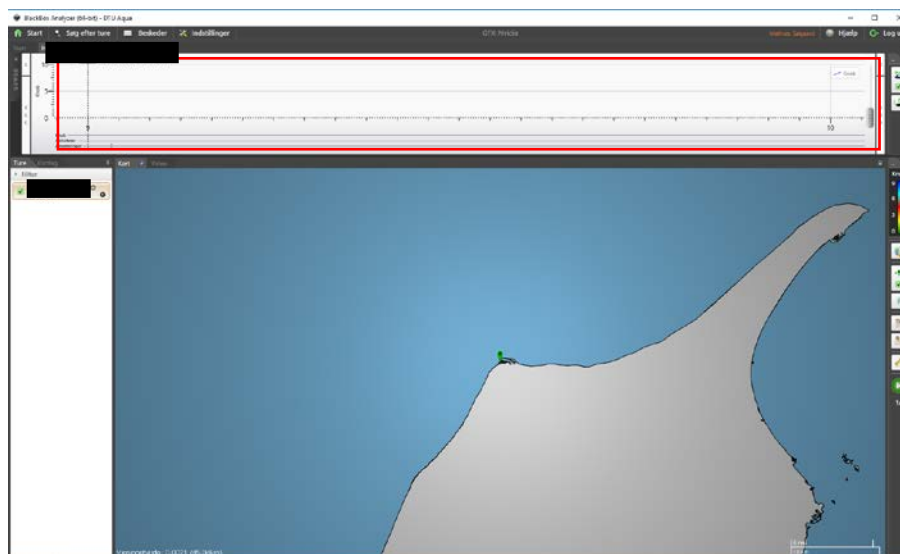
The picture here shows a typical ND case, as there is no GPS (blue speed line) or video present on the video bar.

Pinger

Certain vessels have pingers on the gillnets, they are visible when the net first comes out of the water, and looks like a larger floater, which holds the gillnet upright in the water.
Pingers are marked as: 1 = present; 0 = not present

GPS

The GPS is present if the route of the vessel is shown in the map tab or if the speed (the blue line) is shown in the graph at the tip, when a trip is opened.
GPS is marked as: 1 = present; 0 = not present
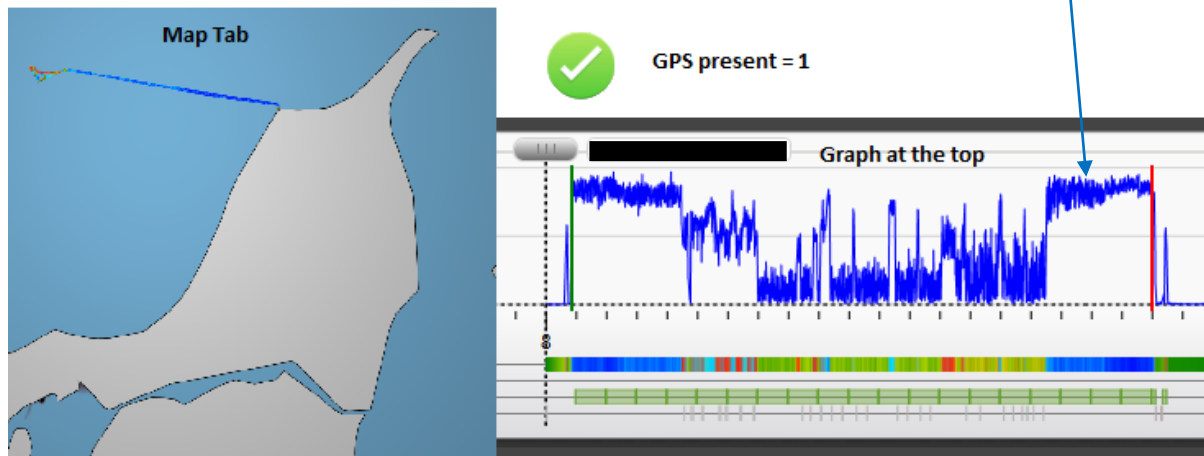
OBS: Even when the vessel is not on a trip the GPS might still be working. Look closely at the vessel in the harbour and look for a GPS signal.

Bycatch

- If a bycatch is caught in a haul, being a mammal or a bird, register it as:
  - 1 = bycatch caught
  - 0 = no bycatch caught.

ALWAYS register the possible bycatch if in doubt, Gildas, Lotte or Anne-Mette will validate it. Remember to write in the comments column if you are not sure about a bycatch!

- We only register bird and mammal bycatches; other interesting catches may be noted in the comments and with an "**Andet**" annotation in blackbox.
  - IF a live seagull is stupid enough to get caught in the gillnet, it should **not** be registered as bycatch. However, it should be written in the comments in excel and the "**Andet**" annotation.

- In cases with **multiple bycatches** in a single haul there should be made extra rows in excel so that each bycatch is represented with one row. This means that almost every column in these rows will be identical, except for the "type" and "spp" column, which might be different. The "bycatch" column may ONLY be marked 1 or 0, and NOT 2 or 3 etc!

Bird Bycatch

Bird Bycatch

Harbour porpoise bycatch

Seal Bycatch

Type

Write down what type of bycatch are caught e.g., mammal or bird.

If you are unsure whether it is bycatch or not (due to bad video quality etc.), ALWAYS register it as possible bycatch with a "?" at the end of the type e.g., mammal? Or bird? And also remember to write it in the comments column.

SPP

If the bycatch is a mammal, write done what kind of mammal it is as specific as possible e.g., seal, porpoise, whale.

If the bycatch is a bird, **leave blank** in the Bycatch Sheet! Gildas will register the species himself.

Status

Leave blank in the Bycatch Sheet

This column is only for Gildas.

Sealmarks

If one or more of the fish have been partially eaten by seals, write a 1 = seal damage, 0 = no seal damage. Seals will most likely eat the stomachs of the fish and leave the head, but this can be difficult to determine.

Video Quality (Vid_qual – in excel)

1 = Perfect quality (very rare!!)→ you can clearly see what is going on, without the camera being blurred or covered in any way.

2 = Good quality → The camera is a little blurred, but you can still see what is going on.

3 = Bad quality → it is hard to tell different species from each other, e.g., macro algae from potential birds.

4 = Impossible quality (very rare!)→ it is not possible to distinguish what is coming up, you can't tell a cod from a seal or even spot a whale (basically a black/grey screen).

Cameras working (Camera – in excel)

1 = At least 2 cameras working, 1 on the inside of the boat and 1 on the outside of the boat

2 = Only camera(s) on the outside works

3 = Only camera(s) on the inside works

4 = No cameras are working on the inside or the outside.

<mark>OBS!!! Cameras are only taken into account **IF** the show the gillnet!</mark>

Soak

Leave blank in the Bycatch Sheet

For further information about soaktime calculation, see soak protocol.

Comments

In this column you are free to write anything you find interesting or worth mentioning. E.g. "hard to see anything due to a lot of macro algae in the gillnet" or "2 sharks caught"

Net colour

Write down the colour of the gillnet (not the floaters) e.g., blue, orange, green etc. Note that the net can be without colour (transparent). In cases with multicoloured net (change in net colour within a haul) write both colours in the order seen with a "+" sign between e.g., blue+orange+transparent. The net colour is most easily determined on the inside camera.

Orange net colour   Green net colour

Target

- Write the main fish species the vessel is targeting.
- There can be multiple targets, which is mostly the case.
    - If there are multiple target fish, write down the fish that are caught the most and then the second most and so forth with a "**+**" sign in between e.g., cod+flatfish
    (This means that the main target is cod, but the vessel also catches a lot of flatfish).
    - Do not register fish if just 1-2 are caught in a haul, as this would not be a target fish. However, if only two fish are caught in a haul and they are known target fish, these are the target. If there are only caught 2 fish and it is 2 cod, the target is cod.
- The target varies between vessels, areas, and season. Target fish are mostly cod, flatfish, saithe. Other known targets are hake, lumpsuckers, and monkfish.

Seen

The Seen column is only referring to the bycatch, if there is no bycatch, write "NA"

IF you are SURE a fisherman has seen the bycatch. 1 = bycatch seen; 0 = bycatch not seen.

Bycatch Excel-sheet

Correctly filled out bycatch excel-sheet, use it for reference

name	date	haul	pinger	gps	bycatch	type	spp	status	sealmarks	vid_qual	camera	soak	comments	netcolor	target	seen
HSO	27-01-18	4	NA	1	0	NA	NA	NA	0	3	3	NA		blue	flatfish+cod	NA
HSO	27-01-18	5	NA	1	0	NA	NA	NA	0	3	3	NA		orange	flatfish+cod	NA
HSO	28-01-18	NF	NA	1	NA	NA	NA	NA	NA	3	NA	NA		NA	NA	NA
HSO	29-01-18	NF	NA	1	NA	NA	NA	NA	NA	3	NA	NA		NA	NA	NA
HSO	30-01-18	NF	NA	1	NA	NA	NA	NA	NA	3	NA	NA		NA	NA	NA
HSO	31-01-18	1	NA	1	1	bird	Sm	male	0	2	3	NA		orange+blue	flatfish+cod	1
HSO	31-01-18	2	NA	1	0	NA	NA	NA	0	3	3	NA		blue	flatfish+cod	NA
HSO	31-01-18	3	NA	1	0	NA	NA	NA	0	3	3	NA		blue	flatfish+cod	NA
HSO	01-02-18	1	NA	1	0	NA	NA	NA	0	2	3	NA		blue	flatfish+cod	NA
HSO	01-02-18	2	NA	1	0	NA	NA	NA	0	3	3	NA	lots of algae	blue	flatfish+cod	NA
HSO	01-02-18	3	NA	1	0	NA	NA	NA	0	3	3	NA	lots of algae	orange	flatfish+cod	NA
HSO	02-02-18	1	NA	1	1	bird	Ua	NA	0	2	3	NA	lots of algae	orange+blue	flatfish+cod	1
HSO	02-02-18	2	NA	1	0	NA	NA	NA	0	3	3	NA	lots of algae	orange	flatfish+cod	NA
HSO	02-02-18	3	NA	1	0	NA	NA	NA	0	3	3	NA	lots of algae	blue	flatfish+cod	NA
HSO	02-02-18	4	NA	1	0	NA	NA	NA	0	3	3	NA	lots of algae	blue	flatfish+cod	NA
HSO	02-02-18	5	NA	1	0	NA	NA	NA	0	2	3	NA	lots of algae	orange	flatfish+cod	NA
HSO	02-02-18	6	NA	1	1	bird	Podic	juvenile	0	3	3	145,7690278	lots of algae. GG: toppet lappedykker	orange	flatfish+cod	1
HSO	03-02-18	1	NA	1	0	NA	NA	NA	0	3	3	164,2380556	lots of algae	blue	flatfish+cod	NA
HSO	03-02-18	2	NA	1	0	NA	NA	NA	0	3	3	166,0784722	lots of algae	blue	flatfish+cod	NA
HSO	03-02-18	3	NA	1	0	NA	NA	NA	0	2	3	166,7283333	lots of algae	orange+blue	flatfish+cod	NA
TGN	07-02-18	1	NA	1	0	mammal	abour seal		0	3	3		habour seal	orange	lumpsucker+cod	1
TGN	07-02-18	2	NA	1	0	NA	NA	NA	0	3	3		plastic	orange+blue	lumpsucker+cod	NA
TGN	07-02-18	3	NA	1	0	NA	NA	NA	0	3	3			blue	lumpsucker+cod	NA
TGN	07-02-18	4	NA	1	0	NA	NA	NA	0	3	3			blue	lumpsucker+cod	NA
TGN	07-02-18	5	NA	1	0	NA	NA	NA	0	3	3			orange	lumpsucker+cod	NA
TGN	08-02-18	1	NA	1	0	NA	NA	NA	0	2	3			blue	lumpsucker+cod	NA
TGN	08-02-18	2	NA	1	0	NA	NA	NA	0	3	3			blue	lumpsucker+cod	NA
TGN	08-02-18	3	NA	1	0	NA	NA	NA	0	3	3			orange	lumpsucker+cod	NA
TGN	08-02-18	4	NA	1	0	NA	NA	NA	0	2	3			blue	lumpsucker+cod	NA
TGN	08-02-18	5	NA	1	0	NA	NA	NA	0	3	3			orange	lumpsucker+cod	NA
TGN	08-02-18	6	NA	1	0	NA	NA	NA	0	3	3		lots of macroalgae and mussels in the net	orange	lumpsucker+cod	NA
TGN	09-02-18	1	NA	1	0	NA	NA	NA	0	2	3			yellow	lumpsucker+cod	NA