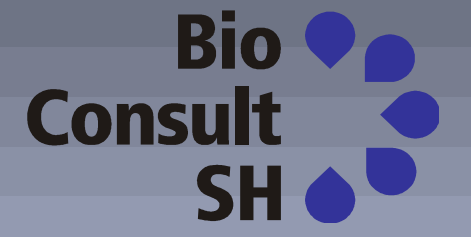


# SURVEYING SEABIRDS USING A HIGH DEFINITION AERIAL VIDEO SURVEY TECHNIQUE



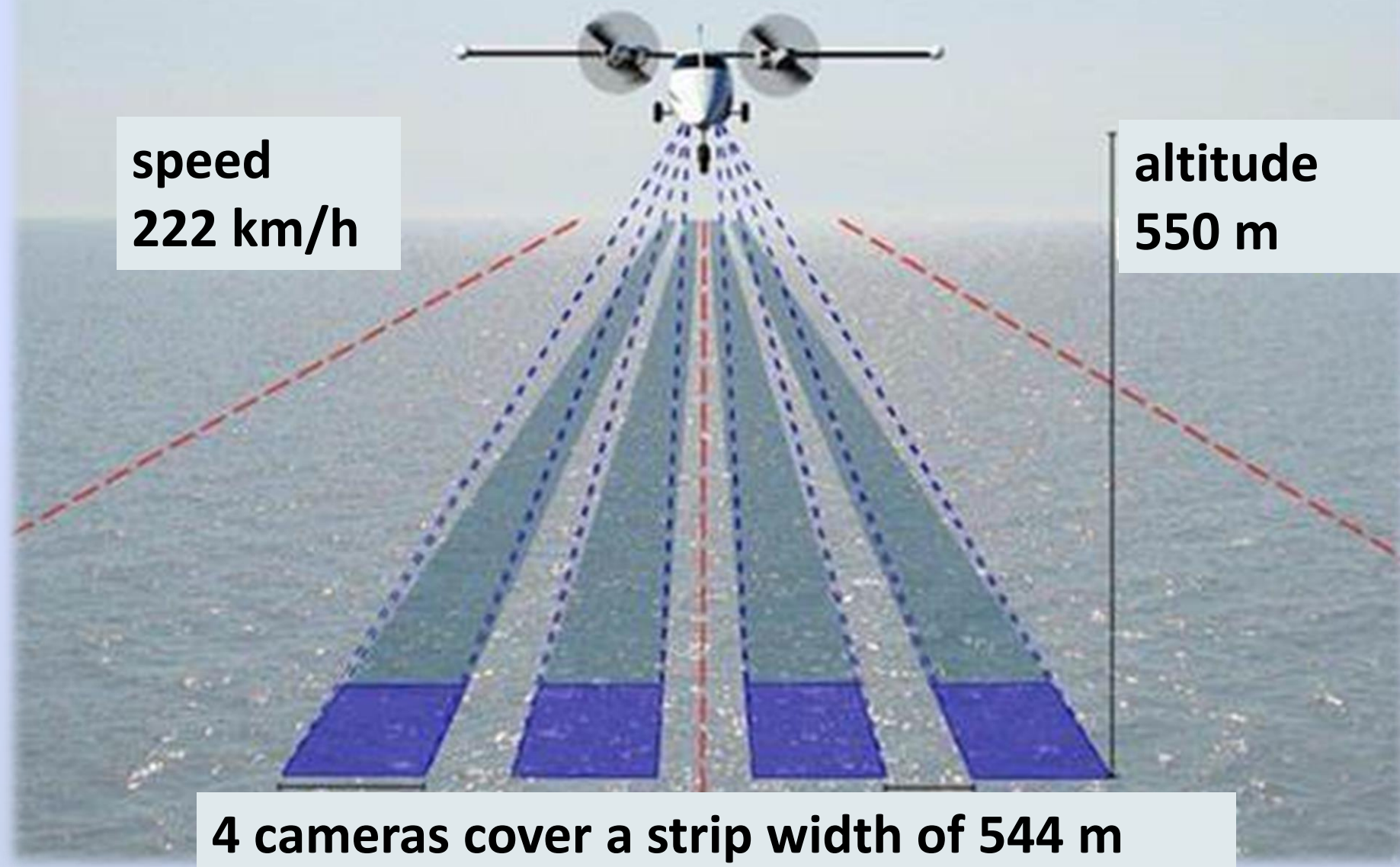
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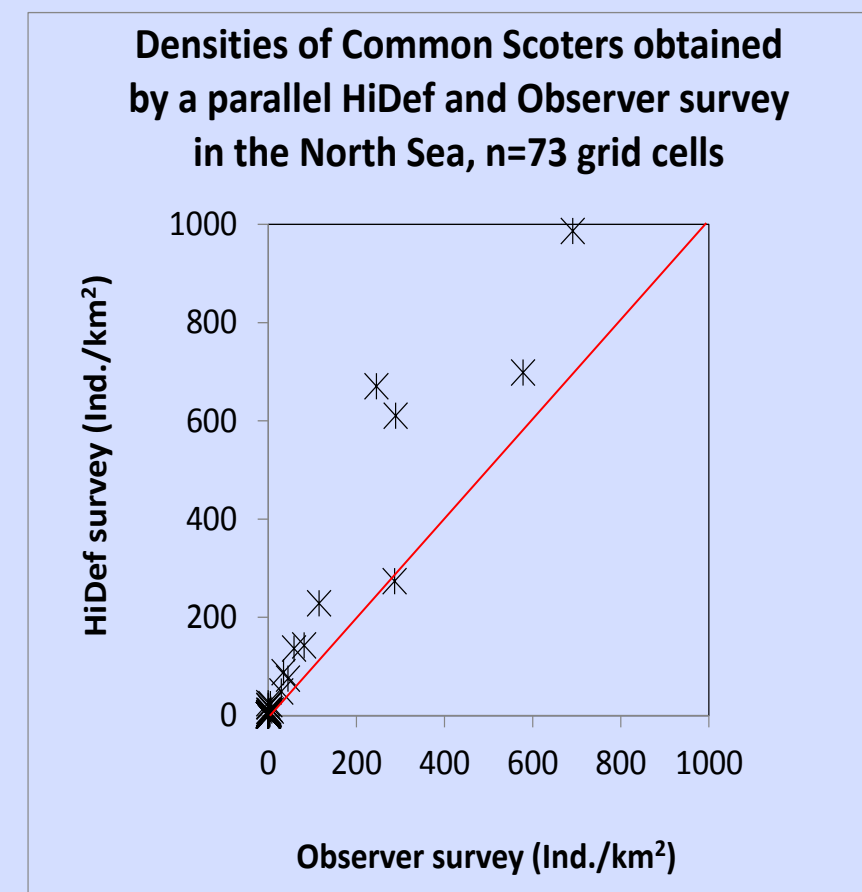


## Method

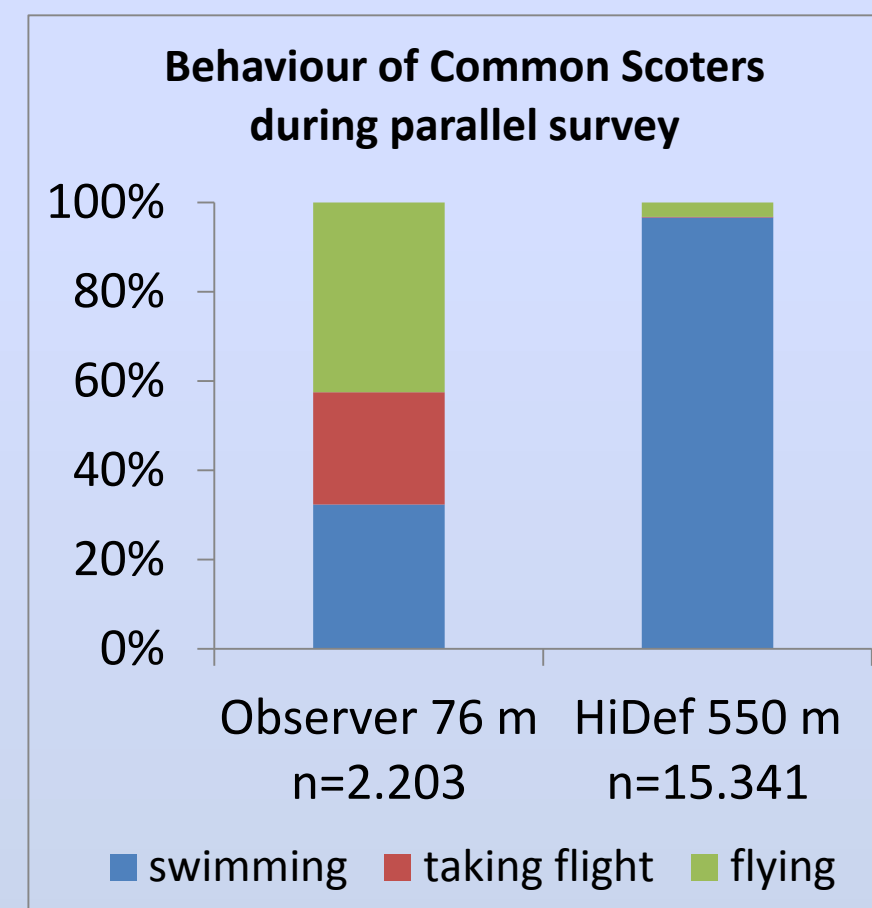
The HiDef video surveying technique comprises of four digital video cameras mounted into a Partenavia P68. At a survey altitude of 550 m they cover a total strip width of 544 m at a resolution of 2 cm/pixel at sea level with 9 pictures per second captured by each camera. The combination of strip width and speed (222 km/h) allows to survey an area of 120 km<sup>2</sup>/h. The system was developed in the UK by HiDef surveying and is used by BioConsult SH in the North and Baltic Seas to survey seabirds and marine mammals with more than 80 surveys carried out since 2014.



## No disturbance & no bias



Video footage freezes the observations and enables accurate counts of flocks, were observer based aerial surveys have a tendency to underestimate the size of large flocks. Also it allows more time for identification and is also a documented record of all observations that can be reviewed at any time. This way observer bias is minimized.



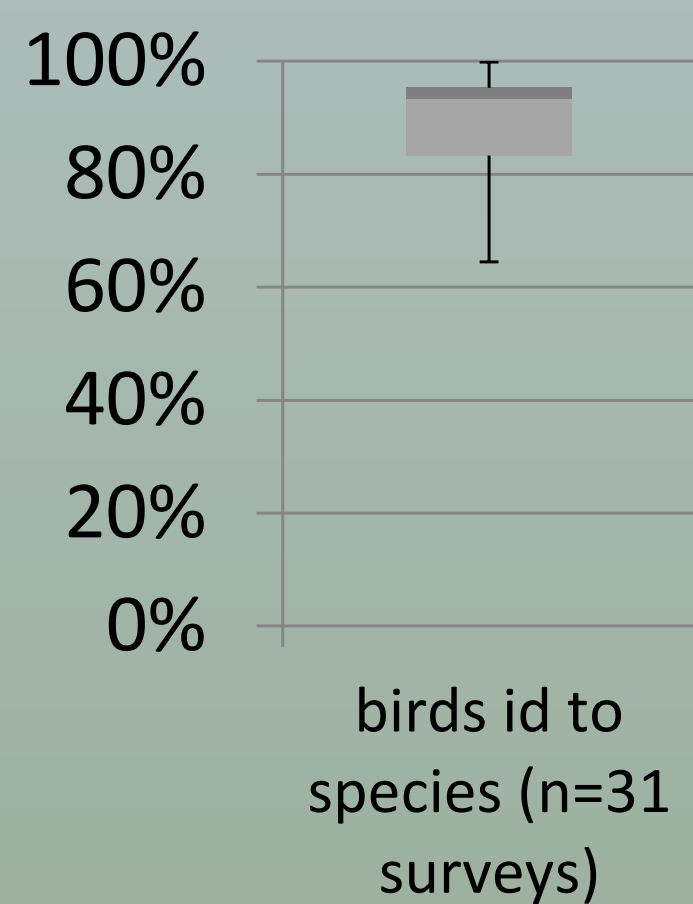
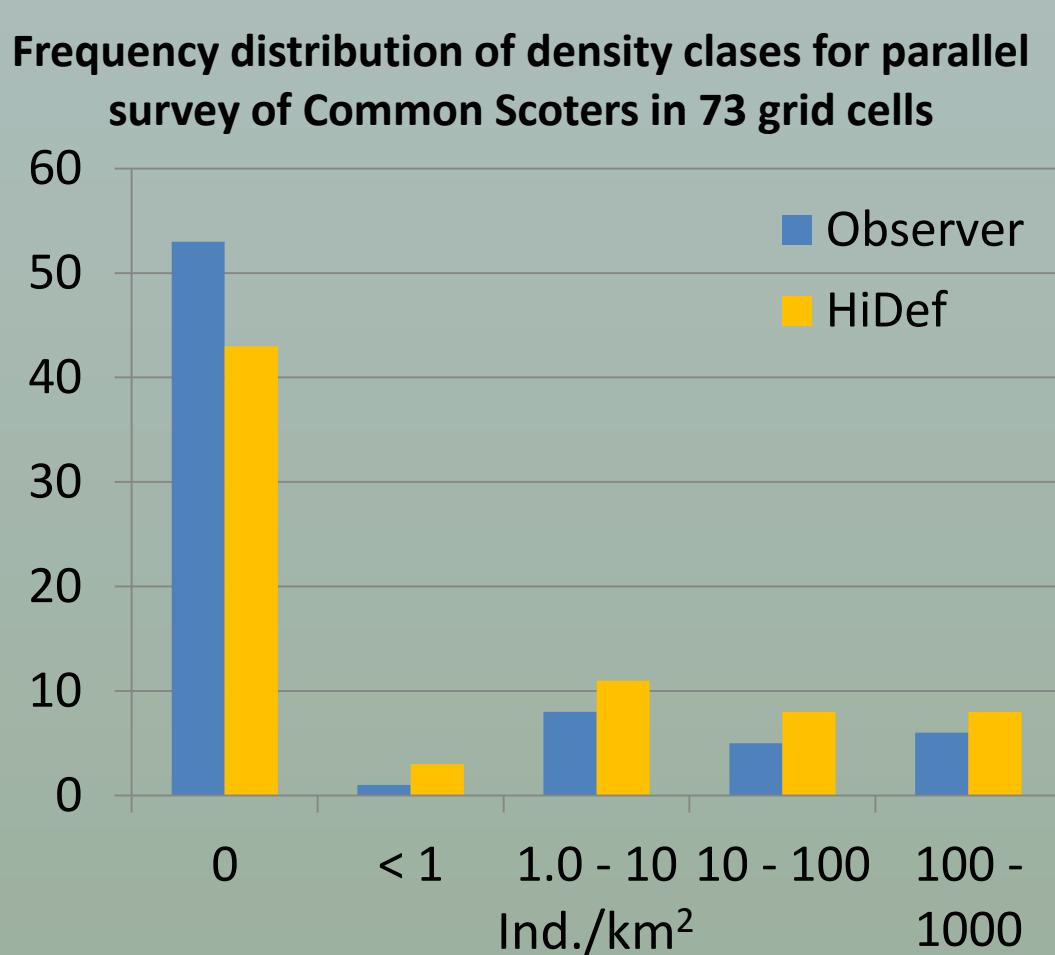
The HiDef technique uses a survey altitude of 550 m, thereby effectively minimizing disturbance. This offers excellent opportunities to study undisturbed behaviour of seabirds and results in more accurate abundance estimates. At the same time, flight safety is increased significantly, especially in areas with vertical structures like in windfarms..



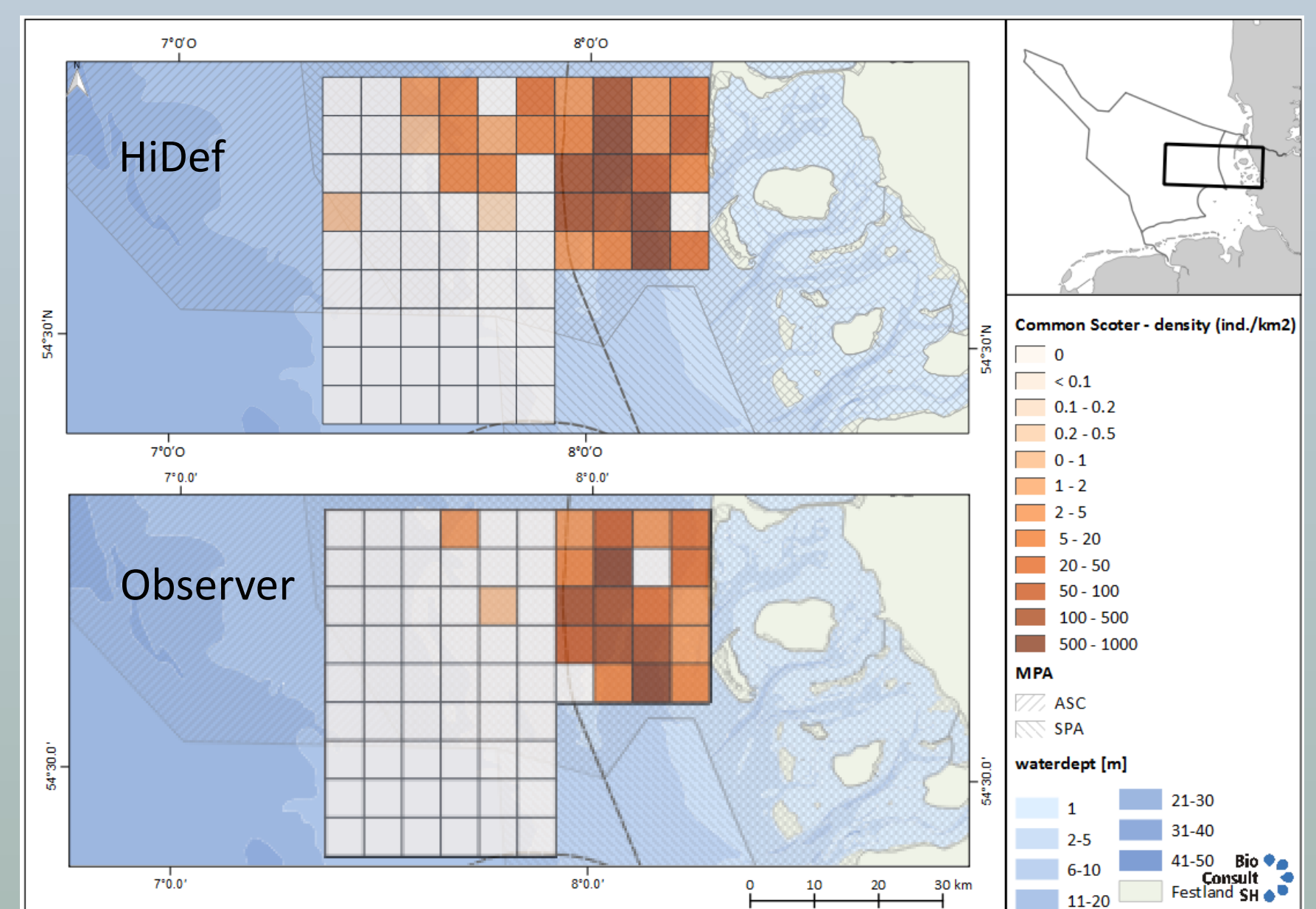
## No distance & less zeros

In traditional observer-based surveys, detection probability decreases with distance from the transect line, and thus a distance correction needs to be applied (Buckland et al. 2005). The video surveying technique however uses strip-sampling and thus detection probability is equal over the entire strip-width of 544 m.

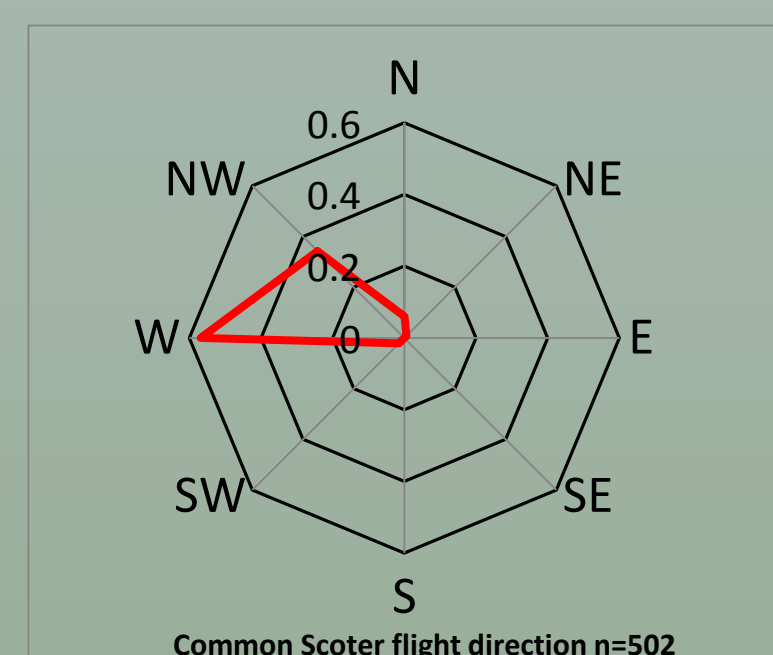
The large strip-width and high flight speed allows to survey an area of 120 km<sup>2</sup> within one hour at a ground resolution of 2 cm. This results in a higher area coverage and thus larger sample size, as compared to observer based surveys, which enables more robust abundance estimates. The resolution of 2 cm enables identification to species level of 93% (median) of birds from our experience of 31 surveys in the North and Baltic Sea.



## Accurate & detailed results



In addition to exact abundance estimates additional data like sex ratio, flight direction and flight altitude are produced which are difficult to obtain with observer surveys.



Sex ratio of Common Scoters:  
1.600 male type  
1.678 female type

