Preliminary mark-recapture analysis of striped dolphins (*Stenella coeruleoalba*) photo-identification data in the Aeolian Archipelago, Italy

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ABSTRACT

Although among the various cetacean species inhabit the Mediterranean Sea subpopulation of the striped dolphin (*Stenella coeruleoalba*) is generally considered the most abundant species, its status is considered vulnerable and the current population trend unknown (IUCN, 2012). In this study long-term photo-id data on striped dolphins from the Aeolian Archipelago (Southern Tyrrhenian Sea, Italy) (**Fig. 1**) were analysed. Dedicated boat surveys were performed in each season from 2009-2019 in a study area of 400 Km² located in the western sector of the Archipelago (**Fig.1**). A photo- ID catalogue was produced, based on the prevalence of skin mark types found on the dorsal fin and other body regions (head, flanks, saddle patch), and used to identified individuals and compare re-captures. The striped dolphin distribution in the different seasons was also assessed for the first time in this region.

MATERIALS AND METHODS

We compared high resolution pictures of striped dolphins according to two different criteria: (A) well-marked dorsal fin and (B) less-marked (i.e., not clear skin marks or notches in the dorsal fin) but well-marked dolphins from Other Body Parts (OBP), mostly, saddle patch (**Fig.2**). Each catalogued dolphin (**N=431**) was labelled as 'PHD', followed by a sequential number, given by the chronological order of identification. For calves, the label is the same of mother, adding a sequential number indicating the chronological order of births (i.e. the first calf of PHD3 is PHD3(1)). Photo-id data were used to calculate the mean encounter rate (**Fig.3**), the mean group size (**Fig.4**) and the number of sighted, resighted and non-identified dolphins (**Fig.5**) for each year and season. We also analysed the occurrence of mother-calf pairs in the different season (**Fig.6**). Finally, we analysed striped dolphin distribution by using QGIS (2.18) (**Fig.1**).

RESULTS AND CONCLUSIONS

We perform 178 striped dolphin's sightings in the study period. We photo-identify 431 individuals in the study area along the years. 74 calves were also sighted with a peek of mother+calf pairs in spring (**Fig.7**). These results suggest that the Aeolian Archipelago is an important feeding area for Mediterranean striped dolphins and contribute to implement appropriate management actions for the conservation of cetacean species in this area.
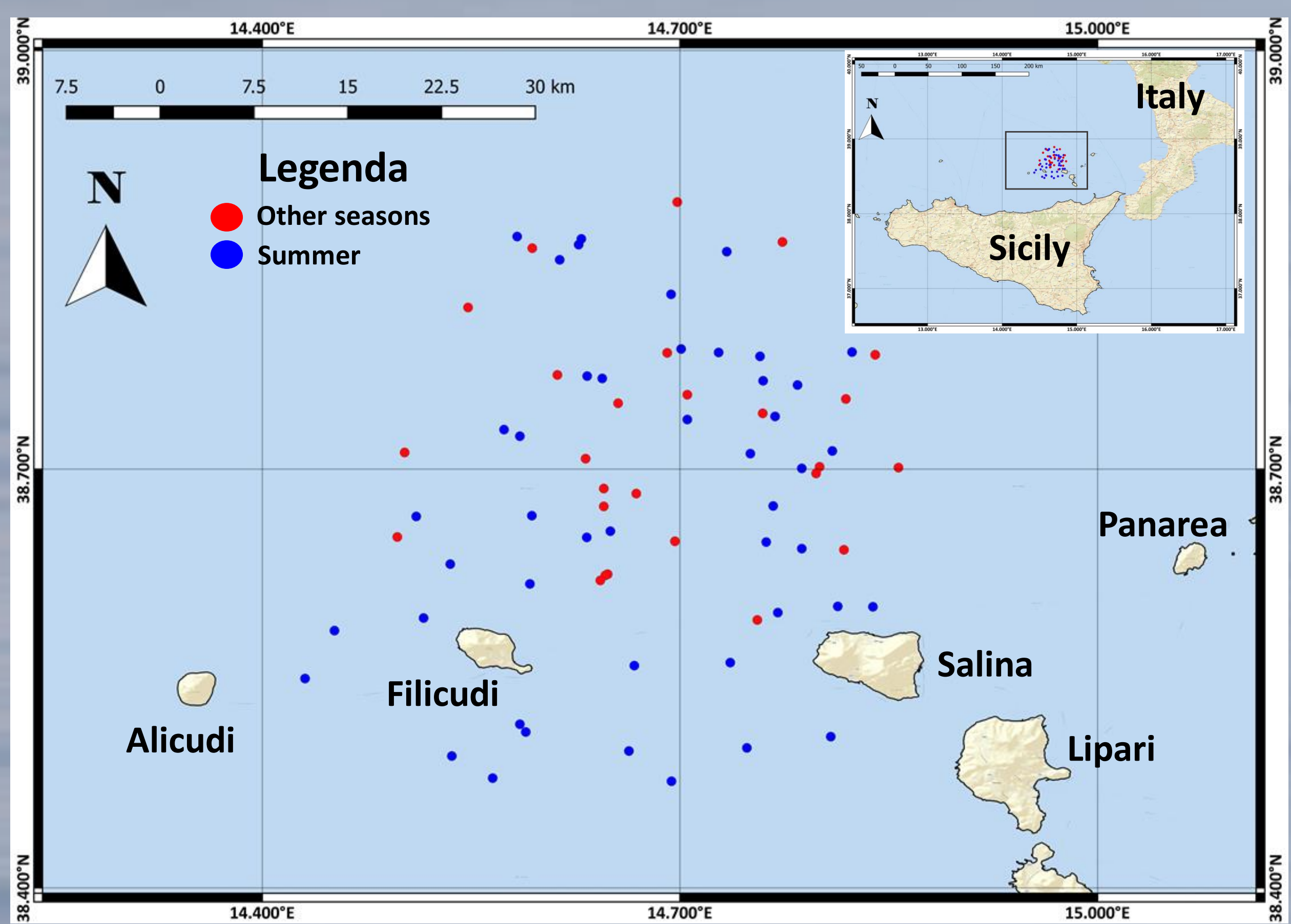

Fig. 1 – Distribution of *Stenella coeruleoalba* inside the study area. N=87. QGIS (2.18)

Fig. 2 – Photoidentification criteria to identify the dolphins from (A) only dorsal fin and (B) dorsal fin + OBP.
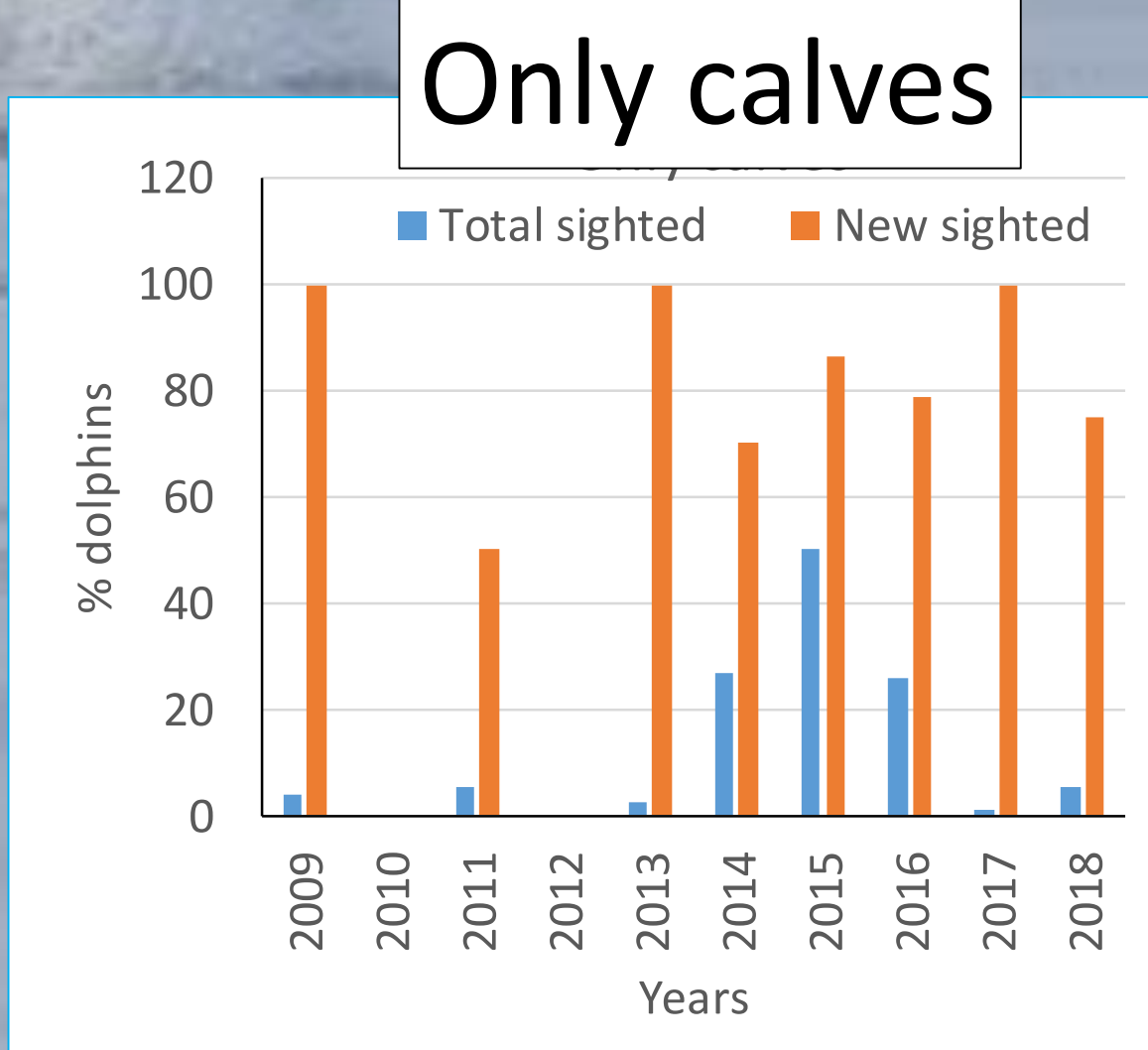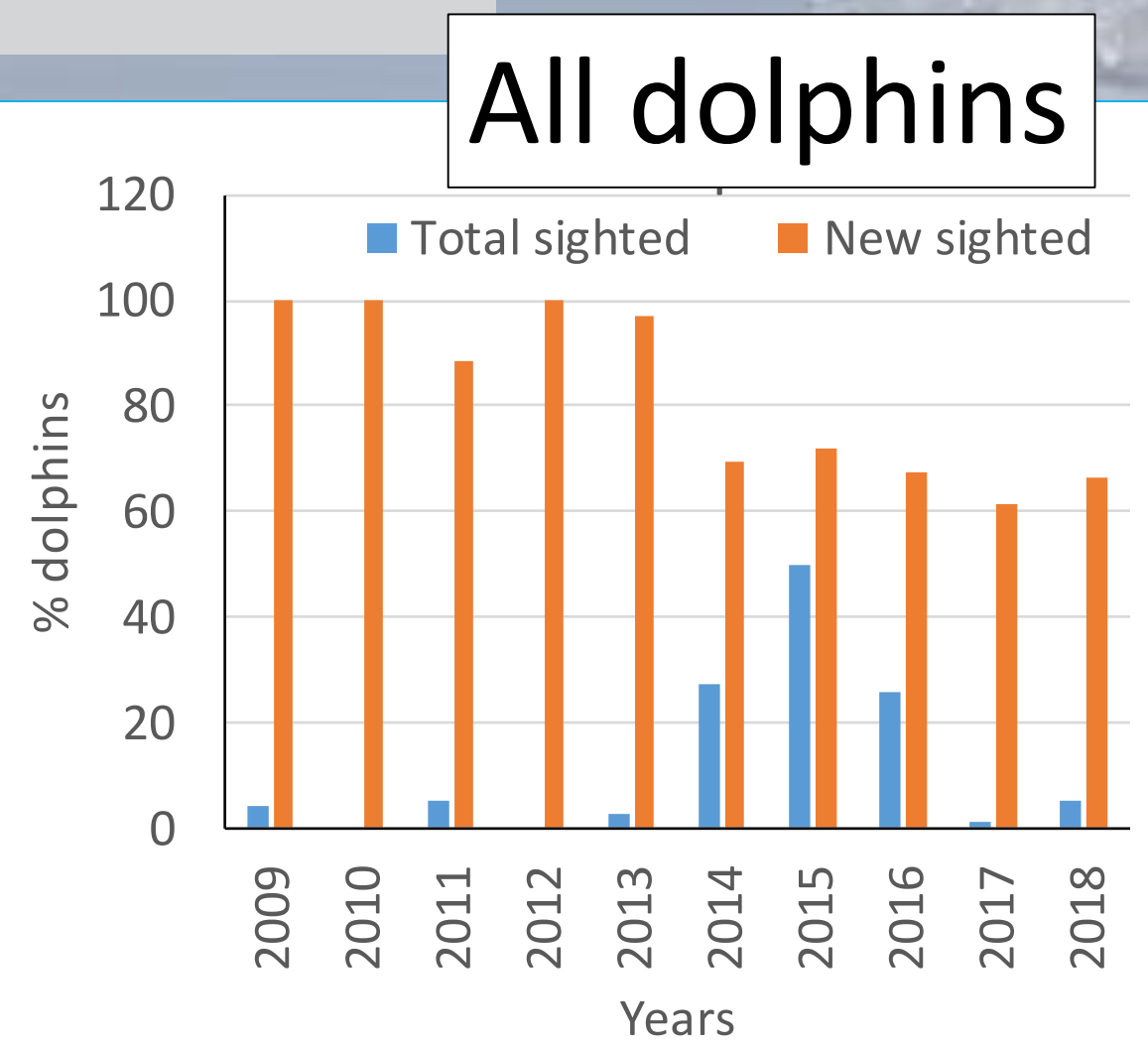

Fig. 6 – The occurence (%) of identified individuals inside the study area: (A) for all dolphins and (B) only for calves.
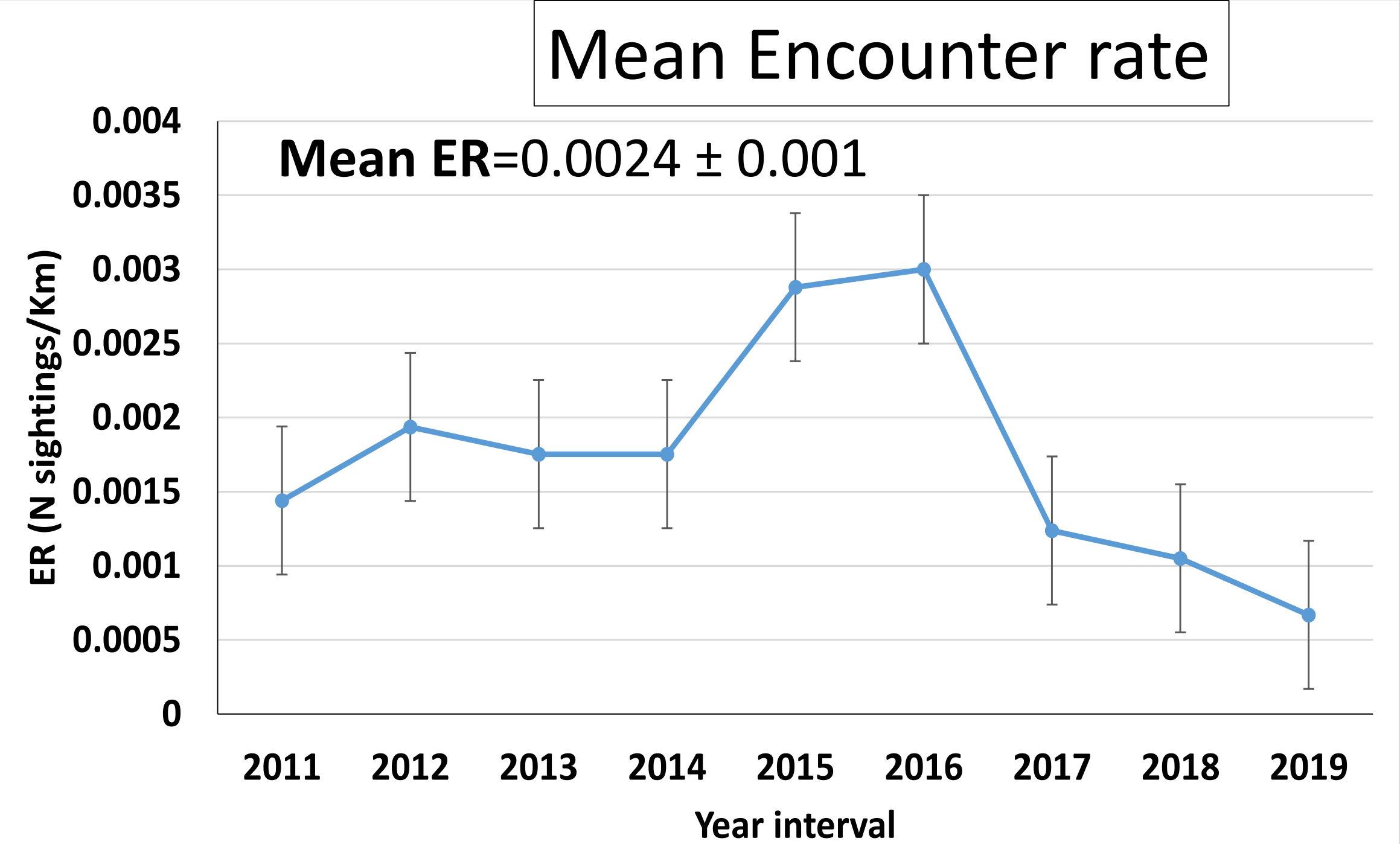

Fig.3 – The mean Encounter Rate (N°sightings/Km surveyed) was calculate for each year of study showing a decreasing trend.
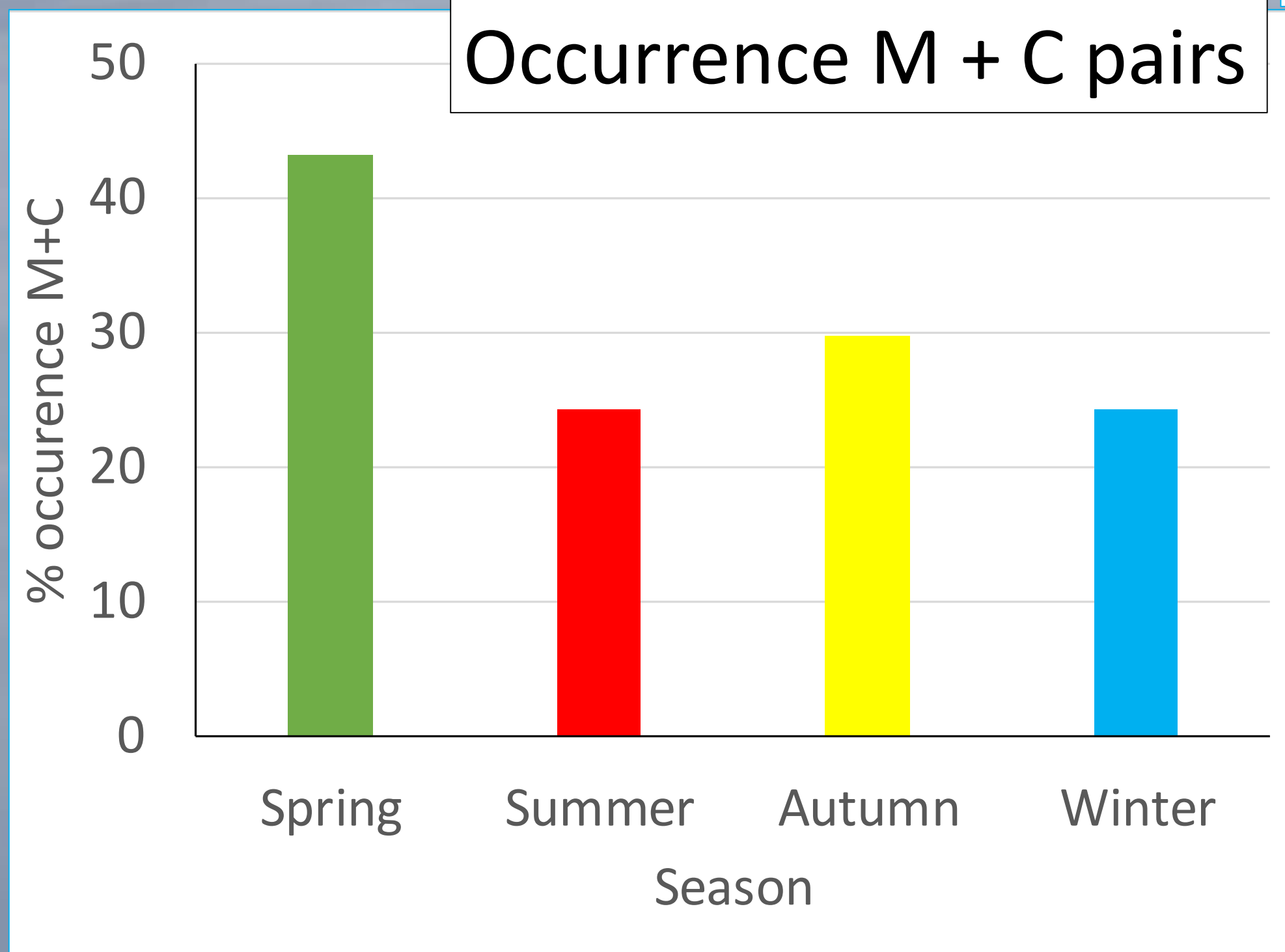
Mean ER=0.0024 ± 0.001

Occurrence M + C pairs

Fig. 7 – The occurrence (%) of mother-calf pairs among season. This trend seems to suggest that the occurence of mother-calf pairs is related to season with more calves in spring.
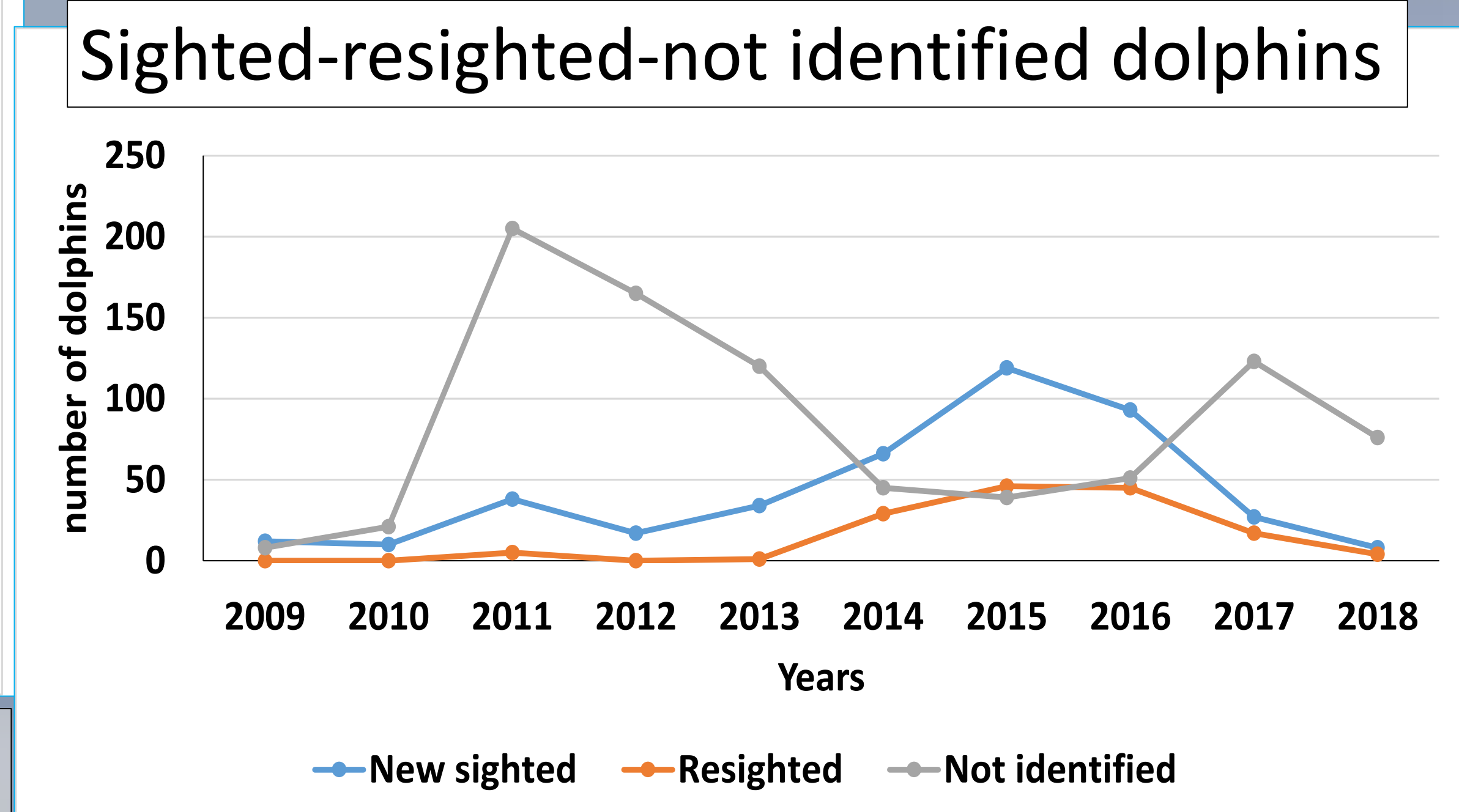

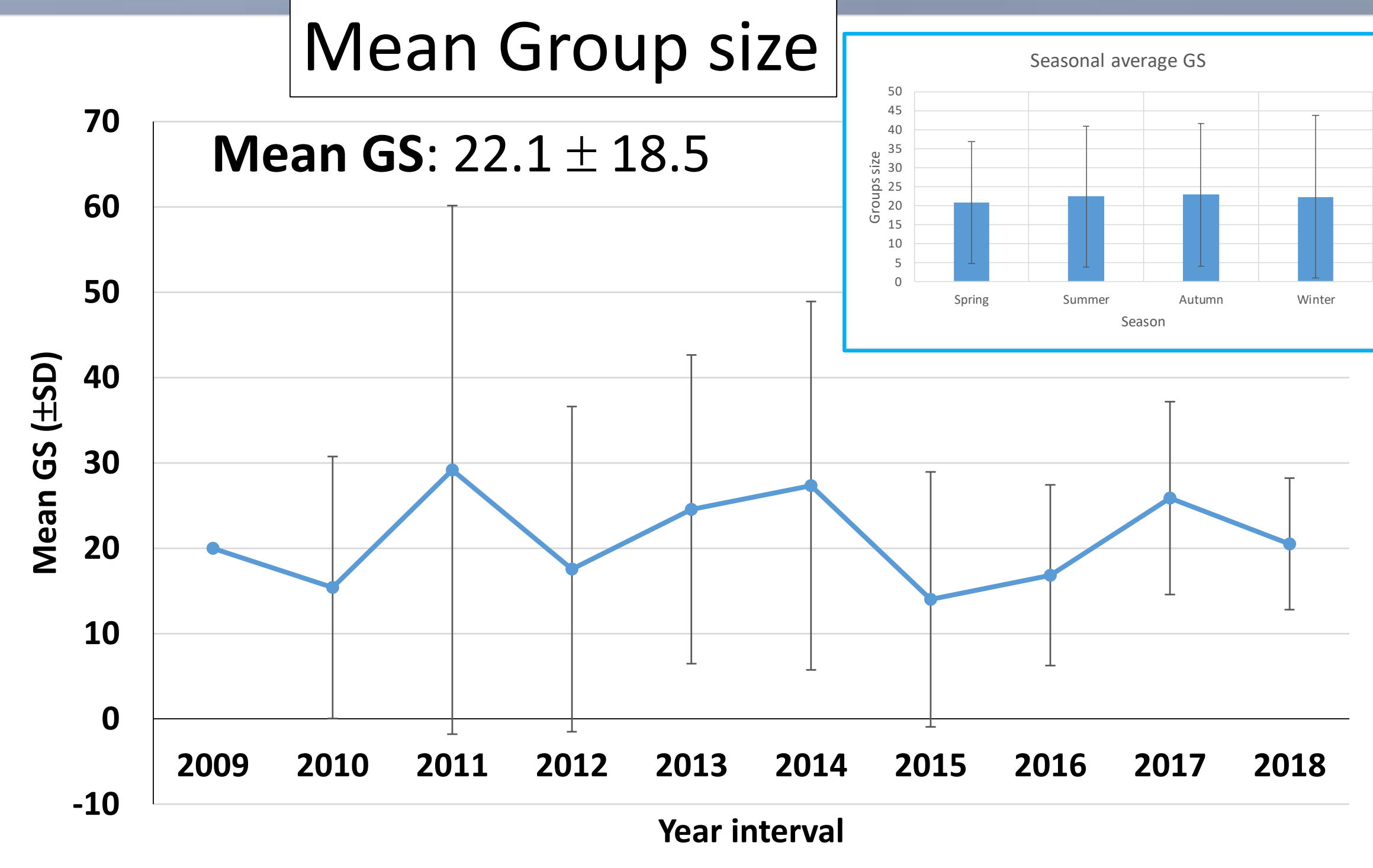Fig. 5 – The cumulative curve shows the number of sighted, resighted and not identified dolphins for year.

Mean GS: 22.1 ± 18.5

Fig. 4 - The mean GS per year and season.