

# SITE FIDELITY, MOVEMENT PATTERNS AND GROUP MIXING OF NORMANDY BOTTLENOSE DOLPHINS (*TURSIOPS TRUNCATUS*)

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## INTRODUCTION

According to local fishermen, the presence of bottlenose dolphins in the adjacent coastal water of "Manche" is nothing new and in their opinion, they could be found all year round. Nevertheless, up to now, little information has been available to determine the status of this population. The present study analyses the first results of photo-identification in Normandy from 1997 to 1999.

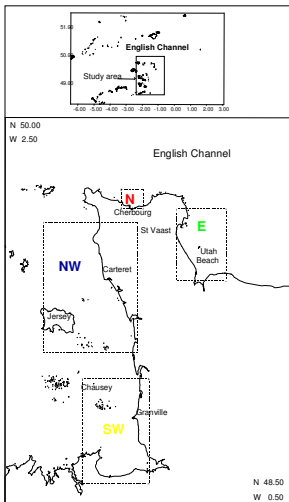


Fig.1 : presentation of the study area

Year	1997		1998			1999	
Season	Sum.	Aut.	Spri.	Sum.	Aut.	Spri.	Sum.
Total surveys	9	3	1	10	3	3	13
Newly-I.D.	46	4	0	9	1	0	6
Total I.D.	46	11	2	39	15	10	21

Fig.2 : recapitulative of boat survey efficiency (Sum.: summer, Spri.: spring, Aut.: autumn).

## MATERIAL AND METHODS (Fig.1)

The Normandy coast and around the Channel Islands contain 4 study sites, which consist of approximately 3500 km<sup>2</sup> of water, averaging 10 m in depth : SW (Mont-Saint-Michel Bay), NW (Carteret to Jersey Island), N (Cherbourg) and E (Saint-Vaast-La-Hougue to Utah Beach). Our photo-identification surveys were conducted from a motorised dinghy, mainly in summer, due to adverse weather conditions (only in Beaufort sea state of 4 or less). First, our effort was limited in NW (1997) ; then, we extended our study area to N and E (1998) and SW (1999).

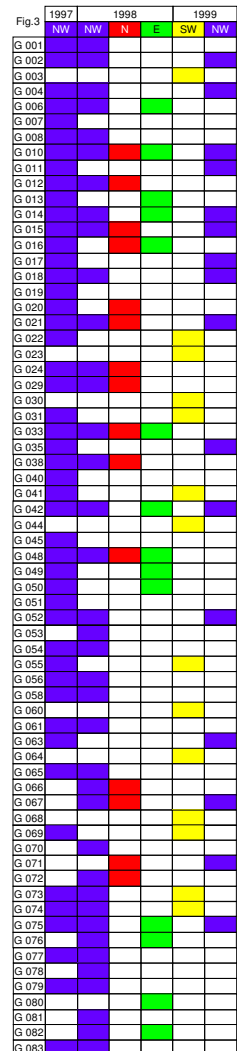
## RESULTS (Fig.2 and 3)

From 1997 to 1999, 42 daily surveys were carried out, totalling 3392 photos. This enabled the identification of 66 dolphins (Fig.2). As Maze & Würsig (1999) did, seasons were defined as autumn (September-November), winter (December-February), spring (March-May), and summer (June-August). Boat surveys took place mainly in summer but our sighting network indicates the presence of tursiops throughout the year, even if we don't know their identity.

The reliable re-sighting of 48 individuals (72.7%) once at least during these 3 years suggests that bottlenose dolphins exhibit a more or less high fidelity to the area. What is more, the fact that 12 of 66 dolphins (18.2%) have been observed 3 years in succession implies that there is a long term site fidelity for some individuals.

Two main movement patterns have been determined in the total area. Indeed, in summer 1998, survey boats in E made it possible to identify or re-sight 14 dolphins. Among them, 9 were sighted in August and September 98, travelling between NW and E zones in different groups (in size and composition), totalling about 70 km. We noticed an intrusion of 4 of individuals initially sighted in E in Cherbourg harbour in November (3 of these dolphins were also in NW in late summer). Moreover, 9 other dolphins observed only in NW in August-September were in N in November too. Otherwise, during our last surveys in SW, we photographed 7 individuals, previously identified in NW in 1997, in groups of newly-identified dolphins. It reveals a 30 km coastal movement for these 7 dolphins.

Fig.3 : a year-by-year summary of the presence of identified dolphins (I.D) during the period study ; shaded blocks represent the presence of each dolphins at least once per year for each sector.



## DISCUSSION

The site fidelity year after year has been confirmed for most of the identified dolphins : some were observed during each year of the study, some were sighted during 2 consecutive years and others were seen every other year. Besides, some were sighted in summer and during the periods of spring or autumn too. Nevertheless, we can't assert an annual site fidelity due to the lack of information in winter ; that is why sedentary life for some dolphins has to be confirmed in the future by a larger sampling.

During our surveys in E, a same group of 14 identified dolphins accompanied by calves was observed from 2 to 11/08/98. In fact, tursiops often frequent a particular area for period of several days or weeks and then abruptly change their pattern and move to another location (Würsig, 1978). Indeed, 4 of these dolphins from E were sighted in NW on 29/08/98. In SW in 1999, we re-sighted 5 dolphins that were not observed since 1997, but the matter of long or short term movement is not defined since surveys could have been not efficient in NW in 1998 (because of our presence in E). Anyway, coastal movements of 30 and 70 km are not surprising for this species : Maze & Würsig (1999) related movements between San Luis Pass and Galveston Bay (45 km) for 3 identified dolphins.

In Normandy, we generally observe groups of 15-20 dolphins, and sometimes more. For example, on 19/09/98, we observed a group of 50-60 dolphins, where some individuals, sighted in E from 2 to 11/08/98, were travelling with individuals observed in NW on 18-19 and 29/08/98. Close associations between dolphins of the two sectors were noticed. The fact that dolphins are found in different sectors in different groups shows how groups are mixing through the different zones. In the same way, research at Galveston Bay and adjacent waters of the Gulf of Mexico shows that group composition was fluid (Maze & Würsig, 1999).

## CONCLUSION

The degree of mixing between populations or groups can only be determined after individual units have been identified by movement patterns and associations, which are the main behavioural factors of primary importance in identifying populations (Shane & al, 1986). As a result, the study effort must be continuous throughout the year, in order to complete the photo-identification catalogue, estimate the use of space, the movements and the mixing habits of the groups, especially in winter.

## References

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