

POPULATION STRUCTURE, MOVEMENT AND SURVIVAL OF AUDOUIN'S GULL (*Larus audouinii*) IN THE WINTERING AREA (PALMARIN, SENEGAL)

Ngoné Diop^{1 2} Cheikh Tidiane Ba¹ Papa Ibnou Ndiaye¹ Jacob González-Solís²

1. Department of Animal Biology, Cheikh Anta Diop University, Av Cheikh Anta Diop, Dakar, Senegal

2. Institut de Recerca de la Biodiversitat and Departament de Biologia Evolutiva, Ecologia i Ciències Ambientals, Universitat de Barcelona, Av Diagonal 643, Barcelona 08028, Spain

ngone04@hotmail.fr

INTRODUCTION

Audouin's gull (*Larus audouinii*) is a Mediterranean endemic breeding species that winters in the Iberian Peninsula and NW Africa, from Morocco to Senegal. In Senegal, the Palmarin Community Nature Reserve (Fig2), within the Delta du Saloum IBA/Ramsar Site, is the most important wintering site south of Morocco. Palmarin is the only site presumably reaching the threshold of importance of 1% of the global population, but little is known about the origin, demographic structure and wintering size of this population.



Figure 1: Audouin's gull in Palmarin

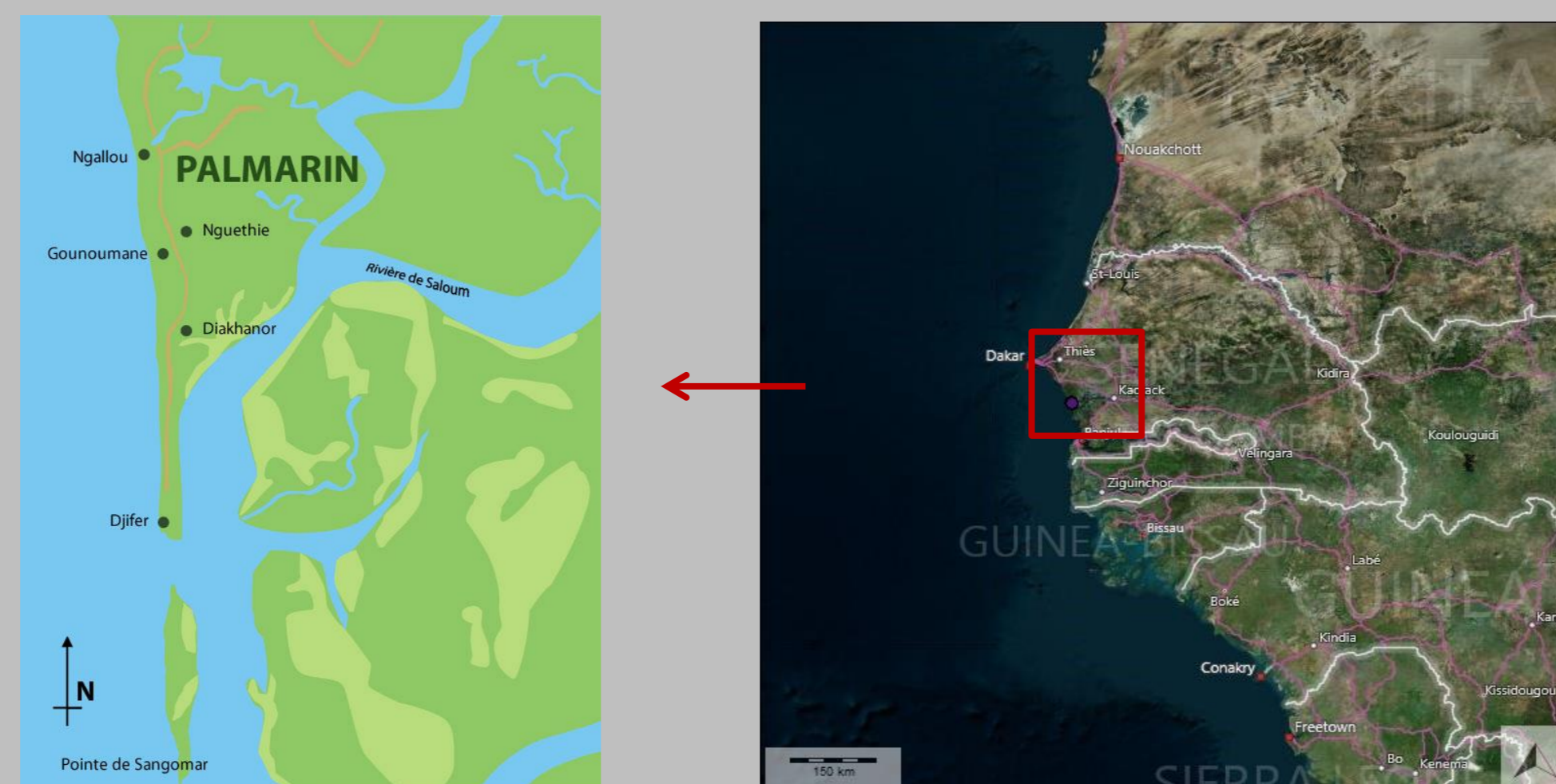


Figure 2: Location of Palmarin Community Nature Reserve

RESEARCH QUESTIONS

We aim to improve our knowledge of the migrating ecology of Audouin's gull in Palmarin. In particular, we aim to know:

- What is the origin of birds?
- What is the age population structure?
- What is the actual size of the population?

METHODOLOGY

We visited Palmarin once a month from 2013 to 2015. At each visit we assessed the number of birds, the age class of each bird and the alpha-numeric code whenever visible. We used POPAN model to estimate population size. Observations from marked birds coded into individual encounter histories.

RESULTS AND DISCUSSION

Population structure in Palmarin

Audouin's gull numbers increased from July to October (fig3). This result is similar to that previously described for the species in Senegambia (Baillon, 1989). Adults, 3rd and 2nd winter birds arrive earlier and 1st winter birds (fig4). This difference is probably due to differences in experience among age classes.

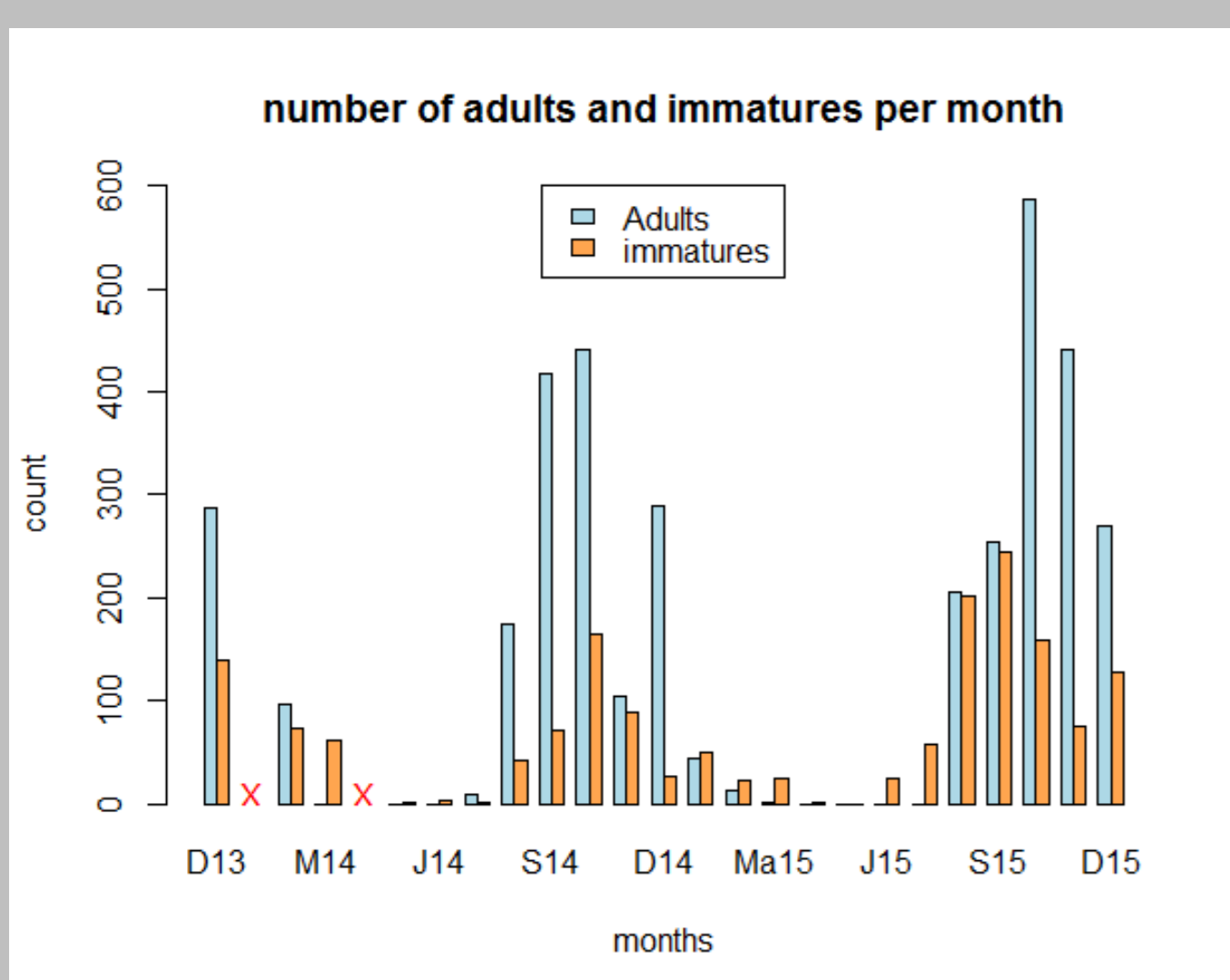


Figure 3. Counts of adult and immature Audouin's gulls per month from 2013 to 2015

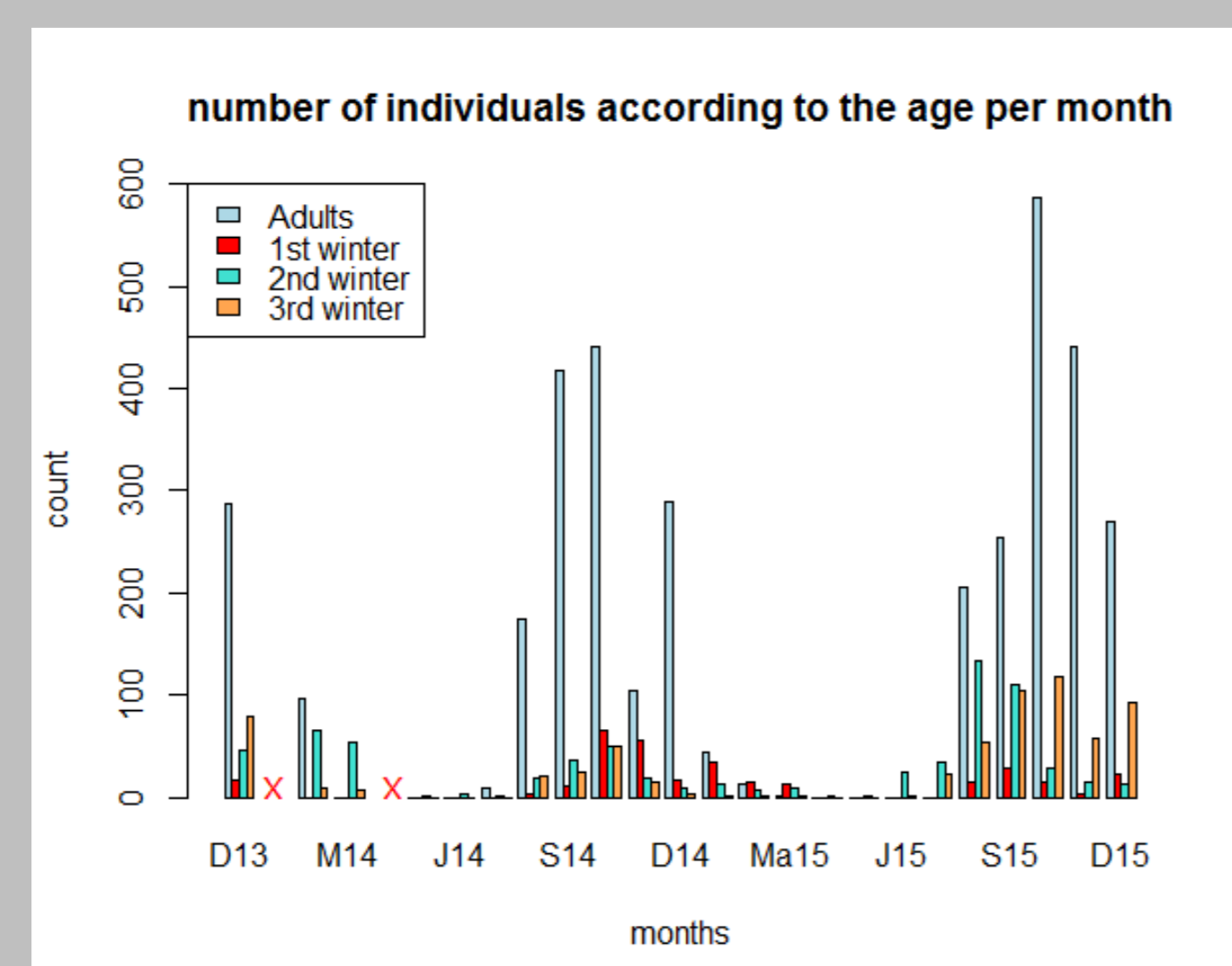


Figure 4. Counts of birds by age class per month from 2013 to 2015

Migration

We obtained 402 re-sightings from 3 countries (fig 5). In all cases we observed more adults than immatures (fig 6). Most records (85.0%) came from Spain, 11.7% from Portugal and 3.4% from France (fig 5), showing the importance of the Spanish population in Palmarin.

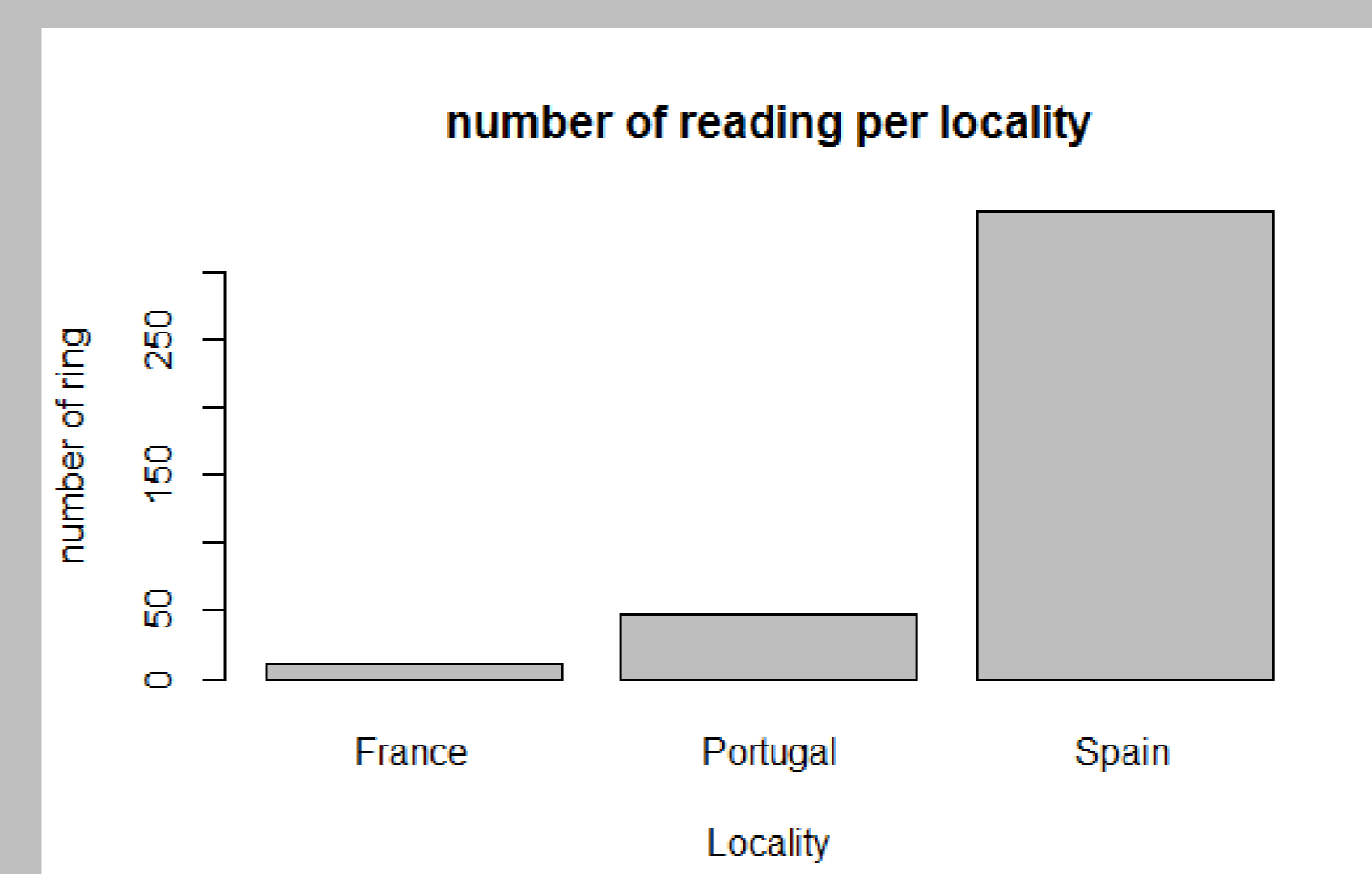


Figure 5. Breeding origin of Audouin's gull readings in Palmarin (Senegal)

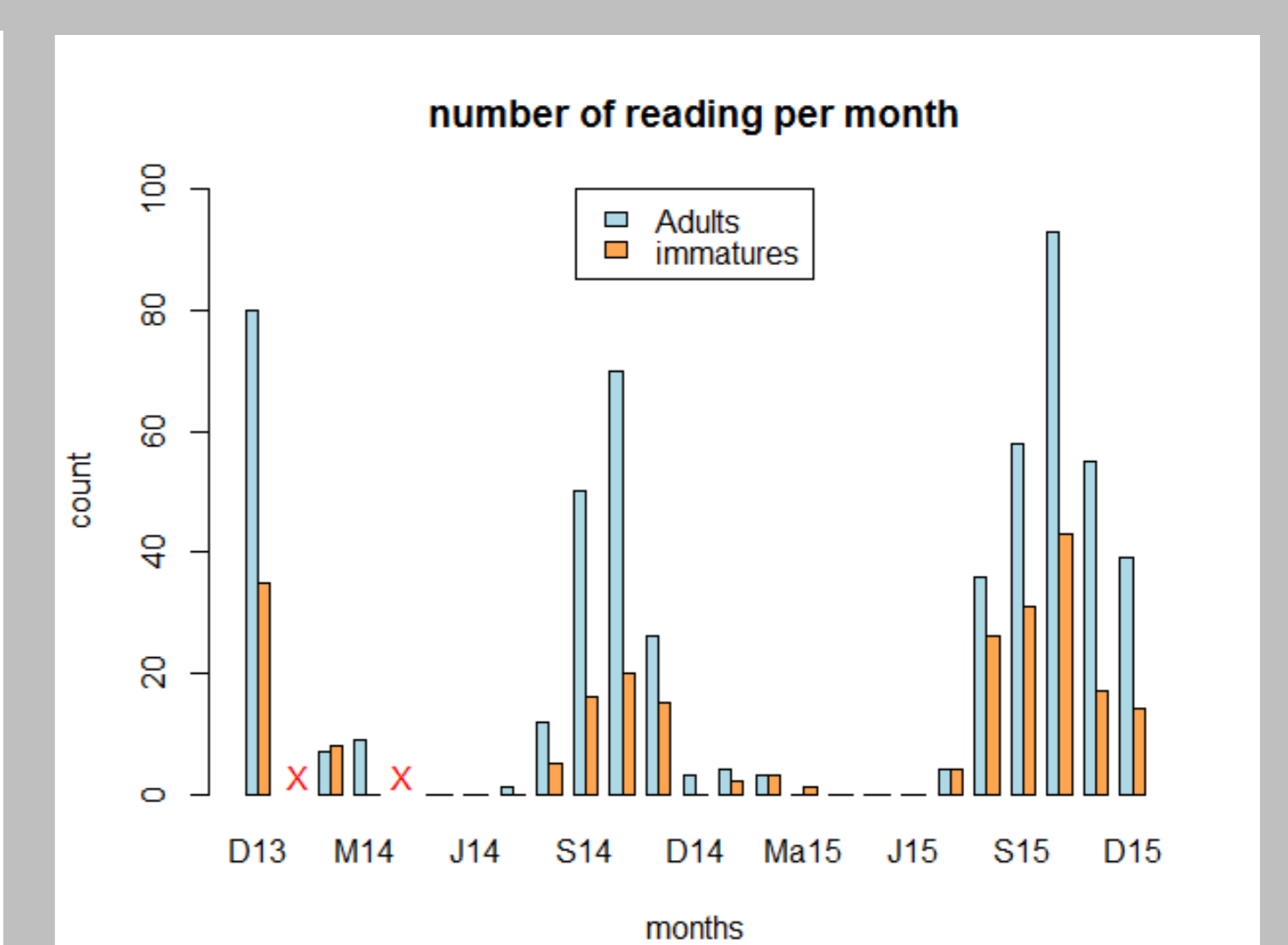


Figure 6. Number of readings of Adults and immatures

population size: POPAN Method

The model $\phi(t) p(\cdot) \text{pent}(g^*t)$ (table1) estimated a total number of to 278 (SE=31) adults and 167 (SE=21) immatures wintering in Palmarin each year.

Table1: model $\{\text{POPAN-}\phi(t) p(\cdot) \text{pent}(g^*t)\}$

Index	Label	Estimate	SE	LCI	UCI
1	Phi	0.5346460	0.0654660	0.4068692	0.6580318
2	Phi	1.0000000	0.0000000	1.0000000	1.0000000
3	p	0.3313842	0.0428387	0.2533389	0.4199500
4	pent	0.0000000	0.0000013	-0.0000026	0.0000026
5	pent	0.2407187	0.0629674	0.1389563	0.3837878
6	pent	0.0000000	0.0000025	-0.0000049	0.0000050
7	pent	0.2980433	0.0791806	0.1682011	0.4713227
8	N	277.8150700	31.6595240	227.8922100	354.2821100
9	N	167.5354400	21.6571270	134.1968200	221.0104100



CONCLUSIONS

Audouin's gulls are present in Senegal mainly from August to April, peaking in October. A few immatures may stay all year round in the area. Most birds in Palmarin come from the breeding population in Spain and the total wintering population is estimated to be 445 individuals (278 adults and 167 immatures). Number of wintering birds was similar across the three years of study, highlighting Palmarin as the major wintering site for the species in Senegal.

REMERCIMENTS

This work was conducted as part of Alcyon project funded by MAVA and implemented by FIBA and thereafter by BirdLife International. We thank the staff of the Palmarin Community Reserve