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POSTER ABSTRACT

Are newly fledged Shags at risk from marine renewable devices?

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The coastal nature of many marine renewable devices means they pose a potentially serious risk to seabirds that forage close to shore. Juvenile birds are typically more naïve than adults and thus may be more susceptible to collision. Increased juvenile mortality as a result of collisions could have population-level consequences due to reduced numbers of recruits. The Shag *Phalacrocorax aristotelis* is an inshore species with a declining UK population. While numerous logger studies have been carried out on adult Shags, little is known about the diving abilities of juveniles. This study used an observational approach to quantify the diving behaviour of adult and newly fledged Shags at a breeding colony at the Isle of May, Scotland, with the aim of estimating differences in potential encounter rate with marine renewable installations and how this may change during the first 8 weeks post-fledging.

Consecutive dive and recovery times were recorded for individual Shags using binoculars and a stopwatch. A total of 382 dives were observed between 1 and 12 July 2012 (30 adult and 72 juvenile dive series). A further 247 dives were observed between 26 July and 8 August (19 adult and 51 juvenile dive series). Observations were made at two sites where mean water depth differed slightly (10 and 15 m, respectively).

In the first observation session adults dived for longer than juveniles at both sites. Site-related differences were observed with adults diving for longer at the deeper site but no differences recorded for juveniles. However, in the second session, juveniles had increased their dive durations with longer dives (36.68±13.27 s) than adults (28.21±12.21 s) in the shallower site and similar dive durations for both age classes in the deeper site (36 s). In the first session, adults spent a greater percentage of time underwater (70%) than juveniles (53%) at the deeper site while at the shallower site little difference was recorded (57 and 54%, respectively). In the second session little difference in the percentage of time underwater was recorded between the age classes at both sites with adults and juveniles spending 66 and 59%, respectively, of their time at sea underwater at the deeper site and 57 and 54% at the shallower site.

While newly fledged Shags did not dive as long as adult Shags initially, these data indicate that with time their diving ability changes, possibly related to increasing independence from adults and improvements to diving physiology allowing longer dives whilst honing prey capture skills. Site differences may be linked to depth, prey distribution and capture rates. There may also be variation in the length of time spent at depth between the age classes. These data demonstrate that the encounter rate for juvenile Shags with marine renewable devices could increase in the 8 weeks post-fledging as dive duration and percentage time spent underwater increase. This study provides useful information on the diving abilities of newly fledged Shags and adults in the coastal zone to aid in collision risk modelling for this species.