



MERSEYSIDE RINGING GROUP



Annual Report 2014

Common Terns at Shotton *Peter Coffey*

MERSEYSIDE RINGING GROUP

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Report Editor: Peter Coffey



Cover: a very special female Barn Owl of the continental sub-species *Tyto alba guttata* found nesting with a male *Tyto alba alba*. Whilst some *guttata* Barn Owls have been reared in captivity in the UK, this is only the second record of a wild *guttata* breeding here. See pages 3-8 (Photo: S Binney)

Acknowledgements

Merseyside Ringing Group receives vital co-operation from many landowners, farmers and gamekeepers in Merseyside, Cheshire and north Wales. They permit group members to work on their property and without their generous help, much of the work of the group would be impossible. The Group also receives considerable support from local authority countryside and ranger teams, local Wildlife Trusts and private individuals. Thank you all for your support.

Maps showing the distribution of controls and recoveries have been produced using DMAP.

Merseyside Ringing Group operate under the auspices of the BTO Ringing Scheme which is funded by a partnership of the British Trust for Ornithology, the Joint Nature Conservation Committee (on behalf of: Natural England, Natural Resources Wales, Scottish Natural Heritage and the Department of the Environment Northern Ireland), The National Parks and Wildlife Service (Ireland) and the ringers themselves. Data from the BTO Ringing Scheme has been used in several articles in this report and we acknowledge the use of this valuable resource.

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Editor’s note

Two Barn Owl articles take pride of place in this edition. The first, by Steve Binney, documents the *Tyto alba guttata* female he discovered breeding in one of his nest boxes, only the second such record for the UK. The second is a tribute to Andrew Duncalf who died in January 2015; Andrew made a huge contribution to the Group’s Barn Owl ringling and the article is based on his own words from his blog which he steadfastly updated throughout his illness.

The successful breeding of Common Terns at Shotton for the first time since 2008 provided an opportune moment to reflect on the development of the colony and its significance nationally, why the colony failed to breed and what has happened since.

It is sixty years since our founder members, Rob Cockbain and Graham Thomason, started ringling in 1954 and ten years since the Group produced its 50th Anniversary Report. This edition updates a summary of foreign controls and recoveries for 1954-2014.

COMMON TERNS AT SHOTTON

Peter Coffey

There was good news in 2014 from Shotton, Flintshire, home of the largest Common Tern *Sterna hirundo* colony in Wales: birds successfully bred, with a minimum of 445 chicks fledging, for the first time since the colony failed to breed in 2009. Merseyside Ringing Group (MRG) has been involved with the colony from its inception 45 years ago. This article explains the development of the colony and its significance nationally, explores why the colony failed to breed and describes what has happened since.

Development of the Shotton colony

Common Terns were first reported breeding in the Dee estuary in 1918 on rapidly-growing saltmarsh off Burton Point. By 1934, fifty pairs were present (Farrar 1938) and a small colony, varying between ten and eighty pairs, maintained a tenuous foothold up to 1970. Breeding success was often poor, mainly because nests would be flooded on any tides exceeding 9.2 metres.

Members of MRG noticed that pairs of Common Terns had occasionally attempted nesting on bunds in the cooling lagoons at Shotton steelworks. In 1970, at the request of the group, British Steel Corporation declared the lagoons and surrounding reedbeds a nature reserve. They also granted permission to anchor a hastily-constructed raft (4 metres square) in one of the pools to see if Common Terns would nest there. It was an instant success: 12/13 pairs nested and 17 chicks were ringed and fledged. The group received the Prince of Wales Award in 1971 in recognition of their efforts in establishing the reserve.

Development of suitable nesting areas continued over the years to meet the demands of an ever-increasing colony and to develop solutions that required lower annual maintenance. Small floating rafts were replaced by a larger fixed wooden platform, which was subsequently extended twice. Photographs 1 and 2 show the immaculately-constructed platform with appreciative Common Terns settled on it. The background view of blast furnaces is a reminder of the heavily-industrialised environment in which the colony developed.



1 and 2: The early nesting platform (R Birch)

The condition of the platform was found to be deteriorating rapidly in 1987 so a decision was taken to create an island out of one of the bunds projecting into the lagoons. The terns had a choice of nesting sites: 259 chicks were ringed on the old platform and just 15 on the new island! The platform was demolished in the winter of 1987/88 and, after some initial wariness, the terns settled into their new home, with 461 chicks being ringed – a new record for the site.

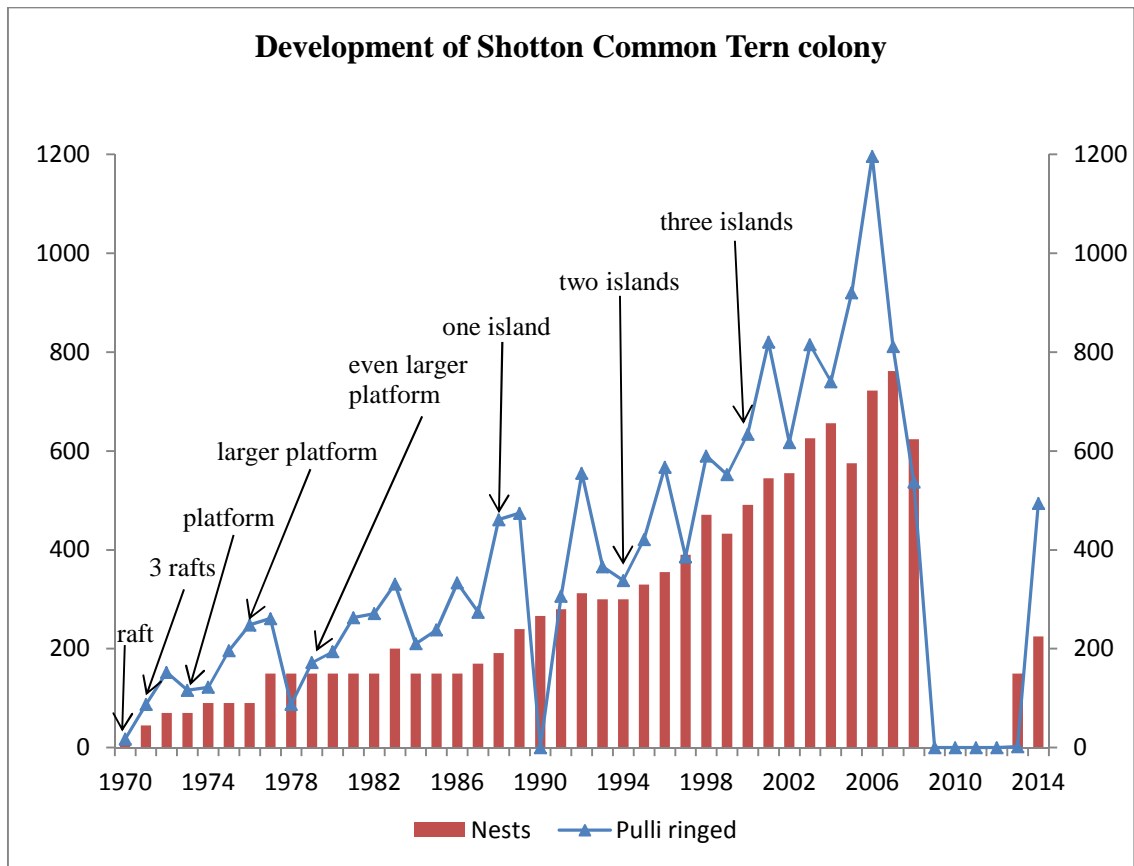
A second island was created in 1994 and the third in 2000. Each island is approximately 64x6m, subdivided into eight compartments (see photo 3), and the total area of the islands is approximately ten times the size of the extended platform. The islands are clearly visible in the aerial photograph (photo 4).



3: The nesting islands (P Coffey)



4: Aerial view of Shotton Lagoons and Reedbed SSSI (© Google Earth)



The colony peaked in 2006 with 722 apparently occupied nests, 1196 young ringed and a minimum of 967 fledged young (see chart above). After two moderately successful years in 2007/2008, a total of 15,673 Common Tern chicks had been ringed since the start of the colony. But the pattern of growth at the colony stopped with a failure to breed in 2009.

National significance

The colony became a key feature of the avifauna of the Dee estuary and nationally. Common Tern colonies in Wales are restricted to Anglesey and Shotton, the latter being by far the largest. It was in the top five colonies in the UK, accounting for up to 5% of the British population. Shotton also had relatively high productivity, regularly fledging more than one chick per pair, compared to productivity for the UK of 0.3 – 0.8 chicks per pair (Source: Seabird Monitoring Programme (jncc.defra.gov.uk/page-2895)). That importance is reflected in its status as an interest feature in both the Dee Estuary Special Protection Area (SPA) and Shotton Lagoons and Reedbeds SSSI which carry conservation objectives to maintain the feature in favourable condition. Common Tern became an amber-listed species of conservation concern because of the localisation of its population, at least half of the UK breeding birds being found in ten or fewer sites; that status is confirmed in Birds of Conservation Concern 4 (Eaton et al, 2015).

Abandonment of the Shotton colony

Abandonment of long-established tern colonies occurs irregularly but is not exceptional. At Shotton, the colony had previously failed once before, in 1990, but on that occasion birds had started to breed, laying 715 eggs by 27th May. However the colony was abandoned in June; examination showed that eggs had not been incubated to embryo stage. Research showed that other tern colonies in the Irish Sea had been affected and there had been a widespread collapse of small fish numbers.

In 2009, parties of up to 70 terns visited the islands between mid-April and mid-May but few nest scrapes were made and only four eggs were laid. MRG considered that one year of failure to breed was of concern but not alarm. In 2010, up to 500 adults returned and appeared to be settling on the islands. However by 22nd May they had disappeared; inspection of the islands showed 150 scrapes but only one egg had been laid. Birds appeared keen to breed but conditions in the Dee estuary were not favourable. The closest colony, Seaforth at the mouth of the Mersey estuary, struggled for an entirely different reason – birds nested but severe overcrowding following an influx of birds from the Dee in the last week of May resulted in the loss of many eggs and a greatly reduced number of fledged young (White S, personal communication 2010). Checks at other tern colonies in north Wales showed that those colonies had successful seasons in both 2009 and 2010. That set the alarm bells ringing!

Possible reasons for the abandonment

Analysis of conditions at the nesting islands found no material change over the previous five years but assessment of the wider environment of the Dee estuary was more challenging. Four factors were examined:

- *Water quality*: monitoring of the estuary is carried out regularly to fulfil the Water Framework Directive and Shellfish Waters Directive, alongside opportunistic reporting of apparent incidents. No algal blooms or major pollution incidents were recorded in 2008-10 and, generally, water quality is higher now than three decades ago.
- *Fish*: the Dee estuary is an important fish nursery for many species and usually a good source of small fish, the preferred prey of Common Terns. Liverpool Bay area is an important spawning ground for sandeel *Ammodytidae* (Ellis et al, 2012) but no data are available to show if, and when, the sandeel population in the Dee estuary declined. One species, *Ammodytes tobianus*, is often found in estuaries and spawns in the autumn.
- *Dredging operations*: fish can be affected by increasing turbidity or changing the nature of sedimentary deposits in spawning grounds. Dredging occurs at two locations. (i) At Broughton, six kilometres upstream from Shotton, where, since 2007, a small amount of material is dredged daily and deposited immediately back into the river using a spraying action known as “rainbowing”. Monitoring reports indicate that there is no effect on turbidity 200m downstream from the operation; (ii) a much larger operation at Mostyn Docks removes material from the port access channel and deposits it in Mostyn Deep. Up to 2009, the channel could be dredged to two metres below chart datum (CD); consent was granted in 2010 to dredge to four metres below CD but had not been implemented in 2011. Dredgings mainly comprise coarse-grained sandy material.
- *Flood waters*: in exceptional circumstances, floods can lead to scouring of the channel leading into the estuary. The very wet weather in 2007, with rainfall totals in the Dee valley 250% above average, created those conditions.

The most probable cause for the failure to breed was the lack of available food within a reasonable distance of the tern colony, although the reason is not clear.

Looking back, the warning signs were there. Whilst the number of apparently occupied nests rose 55% from 491 in 2000 to 762 in 2007, productivity fell significantly:

- the mean clutch size declined from 2.65 eggs in 2000 to 2.23 in 2008; and
- from 2000 onwards, the five-year average chicks per pair index fell below 1.34, the baseline specified in the Dee Estuary SPA that needs to be met to maintain favourable condition status.



Hoping for a recovery

So was there any cause for optimism? Three characteristics of Common Terns provided some: they are long-lived, many surviving for more than 20 years; breeding adults tend to be loyal to their colony, returning each year; and adults choose not to breed if they are not in good condition – they would rather avoid the stress and return the following year.

5: Clutch of three eggs about to hatch (D Norman)

Waiting and watching

Only natural processes would determine whether or not sustainable fisheries could re-emerge. The nesting islands were repaired and weeds cleared ready for potential breeding. But MRG wanted to learn more about Common Tern behaviour in the estuary and at the colony, to be achieved by conducting boat and land-based surveys across the estuary and by installing cameras capable of recording day and night-time activity on the nesting islands. The results are summarised in table 1.

In 2011 and 2012 courtship displays and mating were observed but birds spent long periods away from the colony loafing on sandbanks. Reassuringly, the terns used the nesting islands for roosting in 2012 but fish must not have been abundant enough to encourage breeding.

That changed in 2013 when at least 200 pairs nested again. However predation by Red Fox *Vulpes vulpes*, the first case ever recorded at Shotton, meant we had to wait for another year for success. Fox-deterrent fencing was erected around each nesting island in the winter 2013/14 to prevent further attacks.



6: Working party from Dee Wildfowlers helping to erect fox-deterrent fencing (P Coffey)

Table 1: Common Tern activity in the Dee estuary and at Shotton, 2011-14

Year	Estimated population (individuals)	Average foraging distance from Shotton	Period present	Activity at Shotton
2011	500+	7.0 km	25/4-17/5 02/6-05/6	Sporadic visits only. Maximum of 150 terns on 05/6. No breeding recorded
2012	400+	5.0 km	08/5-12/6	Night-time roosts on 20 out of 23 nights between 21/5-12/6. Peak activity at high tides greater than 8.5 metres. Daytime visits were of short duration. Fewer than 10 eggs laid.
2013	400+	4.5 km	19/5 01/6-16/8	Nesting on all three islands. Red Fox raided the colony on 16/06 – all nests abandoned. Approximately 250 adults stayed but only 40 new nests started. Second visit by Red Fox. Colony abandoned except for two pairs feeding chicks. Two chicks ringed and fledged.
2014	450-500	3.0 km	30/5-01/9	Nesting on all three islands. No predation. Estimates of 605 eggs yielding 550 chicks, of which 494 were ringed and 445 fledged. Foraging activity by adults with chicks to feed monitored (see below).

Foraging distances for Common Terns are important because, unlike most other seabirds, they do not collect multiple prey items in their bills or gullets; they return with just one item. Recent studies suggest the average foraging distance for Common Tern is 4.5 ± 3.2 km SD (Thaxter et al, 2012). The average foraging location shown in table 1 represents the distance from Shotton. In 2011-12 birds were loafing on sandbanks closer to the feeding areas and chose not to fly to the nesting islands; in later years, as the availability of prey items improved, the average distance shortened from 7.0 km in 2011 to 3.0 km in 2014.

Monitoring (boat survey and land-based observations) in 2014 showed that feeding activity was concentrated within 5 km of the colony, depending on the state of the tide. At high tide, intensive feeding could be observed by the Flint bridge and the jetty, within 500m of the colony, and birds were recorded regularly upstream from the colony for the first time since 2008. Only one tern was recorded feeding more than eight kilometres from Shotton. The success rate of terns hunting for prey was very high: it was generally more than 50%, and two sessions observing at slack water on the high tide under the Flint bridge recorded success rates as high as 75%. Terns dived for most prey items but occasionally (<10%) birds would take prey from the surface. Once they had captured their prey, they immediately departed for the colony.

A strong recovery

After four blank years with no attempted breeding, and one false start in 2013 disrupted by Red Fox predation, 2014 finally brought success. Fortunately breeding conditions were excellent – benign weather, no predation and abundant prey items enabled 445 chicks to fledge. No accurate nest counts were made during the breeding season but calculations against a variety of assumptions show that there were 420-500 breeding birds with the chick per pair index at 1.80-2.15, well above the 1.34 threshold. MRG will continue to survey the Dee estuary and monitor breeding performance, checking for those warning signs that the colony is under stress again. Let's hope that "our" colony, now in its 45th year, will prosper for many years to come!

Acknowledgements

The resolute support of the landowners (initially British Steel and currently Tata Steel UK) has been fundamental to the success of the Shotton colony; they have facilitated each stage in its development and contribute to on-going maintenance and security of the islands. Special thanks to Steve Hughes for his prodigious efforts over the last few years to restore tern breeding.

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7: Recently hatched chick with second chick breaking through the egg shell (H Pulsford)