

Re-profiling of islands in a gravel pit to improve nesting conditions for terns *Sterna* and small gulls *Larus* at Dungeness RSPB reserve, Kent, England

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SUMMARY

A series of gravel islands were once important for breeding terns and small gulls, but their numbers declined with none breeding in 2002. The possible causes included vegetation succession and competition and predation from large gulls. In February 2005, invading scrub was removed and the islands re-profiled and lowered to encourage winter flooding in an attempt to improve breeding habitat. Single pairs of common tern *Sterna hirundo* nested in 2005 and 2006 and five pairs of black-headed gull *Larus ridibundus* in 2005. However, high numbers of herring gulls *Larus argentatus* also bred in both years.

BACKGROUND

When Burrowes Gravel Pit, now part of Dungeness RSPB reserve in Kent (southeast England) had been excavated and was being decommissioned, islands were left in the middle. These were specifically for nesting birds, but with relatively little design input. Five main islands groups were present, originally with shingle surfaces and varying in size from approximately 100 m² to 0.75 ha. The islands varied in height with the majority of the island surfaces well above average winter water level thus experiencing little winter inundation.

In the 1980s and early 1990s, these islands supported a thriving and expanding tern colony with up to 350 pairs of Sandwich tern *Sterna sandvicensis*, 300 pairs of common tern *Sterna hirundo*, and more than 1,000 black-headed gull *Larus ridibundus*. It was also one of the first breeding sites in Britain for Mediterranean gull *Larus melanocephalus*. However, in the mid 1990s, numbers of these small gulls and terns started to decline and by 2002 none were successfully breeding at Dungeness. This decline is thought to have been linked to a number of factors including:

Mammal predation - several incidents of predation of tern and small gull nests occurred

due to badger *Meles meles*, American mink *Mustela vison* and red fox *Vulpes vulpes*.

Large gulls - breeding populations of large gulls, particularly herring gull *Larus argentatus*, increased, resulting in greater competition for nest space with the smaller species and also predation of their eggs and young. The increased breeding population of large gulls may have been aided by a switch from spring to autumn clearance of the island vegetation, which allowed the large gulls to overwinter on the islands and establish territories earlier (by late winter/early spring).

Succession - over the 25 years of their existence the islands have gradually become increasingly dominated by perennial and woody vegetation, and a thick humic layer has replaced much of the original bare shingle surface.

Favourable habitat nearby - establishment of currently more favourable habitat for small gulls and terns at the nearby Rye Harbour Local Nature Reserve and in northern France has perhaps lead to birds occupying these areas in preference to Dungeness - tern colonies are often ephemeral and move between adjacent sites.

ACTION

In an attempt to redress the decline in the small gull species and tern population, a number of initiatives were undertaken, predominantly directed at decreasing numbers of larger gulls, reducing predation and maintaining the islands in an early successional state and thus in favourable condition for nesting terns by removing vegetation.

For a number of years in the 1990s / early 2000s the eggs and nests of large gulls were removed to limit their breeding productivity. However, this did not appear to have any effect on halting the decline of smaller gull and tern species and also proved to be disturbing to breeding cormorants *Phalacrocorax carbo*. This was stopped in 2003.

A grid of 'exposure lines' were deployed to keep larger gulls off one, newly exposed, low island. This comprised washing line strung across the island from posts spread to allow terns through but too narrow for gulls to land amongst. This proved unsuccessful, large gulls still managing to settle on the island and no terns were attracted.

No major action was undertaken to try and reduce predation by foxes or badgers as it is believed that the visits to the islands were by a very low number of 'rogue' individuals, which would have been difficult to target. Badgers are in any case protected in the UK.

American mink have been trapped intermittently at Dungeness. A number of effective trapping seasons (around year 2000) appeared to have reduced mink numbers so targeted trapping ceased. Recent evidence of an increase in mink numbers however, has prompted trapping to be resumed.

Island re-profiling: In February 2005, work was begun to re-profile three of the islands in Burrowes Pit. A 5-tonne dumper and 6-tonne excavator were floated in turn across to three of the islands on a rigid framed raft. The island surface substrates were turned over and skimmed, dropping the height of the islands to levels near to the average winter water level. Inundation through the winter would have two effects: firstly, it would limit the places for large gulls to roost and stop them establishing territories early in the spring; secondly, vegetation growth on the islands would be reduced by flooding. Vegetation was cut and burnt. Larger willow *Salix* trees which entirely covered one island were dug up and dumped

over the edge of the island into deep water. The islands were re-profiled, adding in channels and shallower banking to make the sites potentially more attractive to terns. The channels excavated in the largest island are flooded in winter and effectively create a number of smaller islets.

The largest island, which had measured approximately 0.75 ha, although still having an overall similar perimeter area, is now comprised of approximately 10 much smaller islets with water channels between them (islet size depends on water level). In early spring, when seabirds return, the sizes of these islets range from approx 50 m² to 750 m². In the other complex of six islands, two were lowered from around 50 cm above water level to within 10 cm of it.

CONSEQUENCES

The islands on which work was undertaken now have much less perennial vegetation, and in winters with typical water levels, a high proportion of the island surfaces are inundated. Small areas of bare unvegetated shingle persist in the summer with growth of annual plant species over much of the remainder. The island which had 100% willow tree cover now has some low perennial vegetation, some annual vegetation and piles of unburnt willow brush.

Although the attempts to re-profile and grade the islands into apparently more suitable habitat for nesting terns has been physically successful, there is, of yet, no return to the large number of breeding terns or small gulls that formerly used to use the pits. In 2005, there was one pair of common tern, five pairs of black-headed gull but no Sandwich terns at all. In 2006 one pair of common tern nested. Approximately 100 pairs of herring gulls nested on these islands in 2005 and 2006, a higher number than in recent years. A prolonged dry period reduced water levels in Burrowes Pit by approximately 45 cm. This means that the skimmed islands are still not partially or fully submerged in the winter, allowing some perennial vegetation to re-establish and the larger gulls to roost and establish early territories.

Terns are notoriously ephemeral in site loyalty and current good conditions at Rye Harbour (6 miles away) and on the north coast of France may well have attracted the terns away from Dungeness. As and when conditions change again and favour Dungeness, the islands could

still be improved and vegetation removal each year will continue.

The clearing of the 20+ year old willow scrub (> 2 m tall), that had been originally left as nesting habitat for cormorants, had a surprising effect. Prior to the clearance, cormorants were not using the island, but when the main island was cleared of scrub (February/March 2005), bonfires were created but before these were burnt, a handful of cormorants nested on them. Other cormorants started to nest on the clear ground around the bonfire and in 2005, 43 nests were active on this island. Colonisation of this island was due to re-distribution of

nesting cormorants at the site, thus overall numbers nesting at Dungeness remained similar to the previous year.

A possible benefit of the scrub clearing has been an improvement to fish habitat. Instead of burning scrub, it was tipped off the side of the island into about a 10 m depth of water. Casual observations suggest that fish-eating birds (e.g. cormorants and wintering smew *Mergus albellus*) aggregate round these parts of the island, possibly because the submerged scrub has improved the aquatic habitat structure in terms of providing a refuge for fish.