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Author: Källander, Hans

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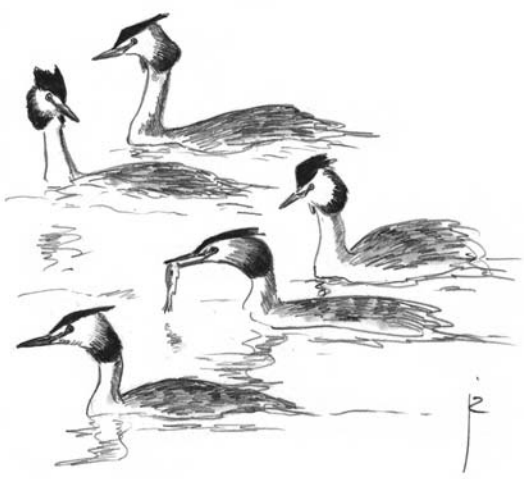
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Fishing flocks of Great Crested Grebes *Podiceps cristatus* consist of breeding birds

Hans Källander[1]



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This note corrects a statement made in an earlier note on flock-fishing Great Crested Grebes *Podiceps cristatus* at the South Swedish Lake Krankesjön, namely that the flocks presumably consisted mainly of non-breeders. This has been proved wrong. The majority come from a loose colony and consist of birds during incubation recesses. Flock-fishing started around 1 May in 2008, 2009 and 2011, but not until the beginning of June in 2010. The reason for the late start in 2010 is unclear. Flocks formed soon after sunrise and dissolved at various times during the day. Only once was a fishing flock seen in early evening.

Key words: Great Crested Grebe, flock-fishing, seasonal occurrence, colonial breeding

[1]Department of Biology, Lund University, Ecology Building, SE-223 62 Lund, Sweden (hans.kallander@telia.com)

In a previous note (Källander 2008), I described flock-fishing in Great Crested Grebes *Podiceps cristatus* during summer at Lake Krankesjön, South Sweden, pointing out its many similarities to flock-fishing in cormorants *Phalacrocorax* spp. and mergansers *Mergus* spp. However, in that note I assumed that the majority of birds forming fishing flocks were non-breeders, studies during 2008–2011 have shown this to be wrong.

The lake was briefly described in my previous note, as were the study methods. Suffice it to add that most of the grebes nest in a loose colony in sparse Reed *Phragmites australis* beds among Black-headed Gulls

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Chroicocephalus ridibundus and in other emergent vegetation off the lake's south-eastern shore. Others nest widely separated in the rather narrow *Phragmites* zone along the margins of the lake.

The start of flock-fishing differed in each of the four years. In 2008 and 2009, fishing flocks were already established during the last week of April and were prominent during May. In 2011, flock-fishing began during the first week of May, whereas in 2010 only tendencies towards the formation of fishing groups (numbering 10–15 individuals) were seen prior to 8 June when the first 'true' fishing flock (30 individuals) was found. The last flocks were observed on 2, 10 and 8 July in 2008, 2009 and 2010, respectively, but already on 16 June in 2011. Flock-fishing seemed mainly to be associated with the incubation period of the grebes. Breeding was, however, quite asynchronous, which may explain some of the differences between years, but the reason for both the late start of flock-feeding in 2010 and its early cessation in 2011 are unclear. The largest flocks were seen on 21 May in 2008 (at least 82 individuals), 8 May in 2009 (140), 14 June in 2010 (62) and 7 June in 2011 (79).

Observations during the four summers showed that there was an exchange of birds between the fishing flock(s) and the breeding sites (colony and solitary territories). Grebes leaving the fishing flock to return to the colony area were monitored on 38 different days. The birds sometimes had to swim more than 2 km from the flock's position to reach the breeding area. They swam in a straight line and appeared to increase swimming speed as they approached the colony. Before reaching the vegetated area they would make a series of long dives, probably to further increase swimming speed (e.g. Bauer & Glutz 1966, Fish 2000). Birds left the flocks individually but sometimes as many as ten could simultaneously be seen heading for the colony area. While grebes usually swam both when returning to and when leaving their breeding sites, on a few occasions they flew (twice back to the colony, six times out to a fishing-flock). Around hatching time, grebes were three times seen carrying small fish while returning to the colony from the flock.

In the morning, fishing-flocks formed shortly after sunrise when small loose groups of diving grebes assembled near the colony as well as further offshore. Those near the colony then swam out on the lake, where the different diving groups gradually united. At the same time additional birds left the colony, once as many as 20 single individuals did so almost simultaneously. At first, fishing flocks remained rather loose but then became denser before starting to swim as a compact unit (Fig. 1). Different fishing flocks then merged and the flock (or flocks) continued to grow as more individuals arrived. Thus, on 25 May 2009, within an hour a flock of 50 grebes had formed.

Fishing flocks broke up at various times during the course of the day and only occasionally was one observed in late afternoon. At this time, diving activity was usually low and birds either dived alone or in small, loose groups. An exception was the windy late afternoon of 31 May 2011 when a flock was still fishing far from the colony at 18 hours when it had just started swimming towards the colony. Fifteen minutes later it was still compact and diving, but by 18.30, as the flock approached the colony area, the birds had fanned out before entering different parts of the vegetated area.

The above observations demonstrate that the fishing flocks consisted of breeding birds that joined the flocks during incubation recesses, but the presence of



Figure 1. A fishing flock of Great Crested Grebes, Lake Krankesjön. Three chicks are seen to the far left. Photo by Hans Källander, 18 June 2008.

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non-breeders in the flocks cannot be excluded. It appears to be rare for Great Crested Grebes to form fishing-flocks during the breeding season. At a number of other Swedish lakes, including two sharing some physical similarities to Lake Krankesjön (Lakes Hornborgasjön and Tåkern), I failed to find any evidence of flock-fishing. Why then do the grebes use this feeding method at Lake Krankesjön? One possibility could be that flock-fishing is related to coloniality. This could be tested at other sites where Great Crested Grebes are known to breed colonially (presumably because of limited breeding habitat; Konter 2008, and references therein). An alternative, or additional hypothesis, is that flock-fishing is associated with the structure of the lake's fish fauna and more specifically, with the presence of shoals of young Roach *Rutilus rutilus*, Lake Krankesjön's dominant fish species (Brönmark et al. 2008). Young Roach appeared to be the grebes' main prey even though considerably larger fish were occasionally captured during flock-fishing.

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Samenvatting

Het is bekend dat Futen *Podiceps cristatus* vaak in groepen naar voedsel zoeken, maar dat ze dit ook doen in de tijd dat ze een nest hebben, is opmerkelijk. Futen die langs de rand van een meer in het zuiden van Zweden broeden, bleken in de jaren 2008–2011 elkaar tijdens broedpauzes op het water op te zoeken om gezamenlijk naar voedsel te duiken. De groepen ontstonden direct na zonsopkomst en losten in de loop van de dag weer op. Het groepsgewijs vissen viel samen met de tijd dat de vogels een nest hadden. Het begon rond 1 mei en eindigde zodra de jongen het nest hadden verlaten. Begin en einde van de periode waarop de Futen in groepen gingen foerageren en daarmee stopten, was niet elk jaar hetzelfde, maar gegevens over het exacte tijdstip van broeden, de helderheid van het water en de talrijkheid van prooivissen ontbraken om verschillen tussen de jaren hieruit te verklaren. (JP)

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