

THE SHALLOW COASTAL ZONE IN THE SW-NETHERLANDS AS A CONCENTRATION AREA FOR RED-THROATED DIVERS *GAVIA STELLATA* – VARIATION IN OCCURRENCE IN RELATION TO WIND AND TIDE

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The shallow coastal zone 'de Voordelta' in the SW-Netherlands is known for the occurrence of relatively large concentrations of Red-throated Divers. The area is intensively managed because of dikes and sluices for coastal defence. Soon after completion of the main dikes in around 1970, one of the bays (seaward of the Brouwersdam) that was formed in the process held relatively large concentrations of Red-throated Divers. These birds occur close to the coast and are readily observed from the dike. The bay is shallow, with some old natural gullies. It is partly protected from the sea by an emerged sand flat of several kilometres long at the seaward side. Since the early nineties long-term monitoring data have been gathered for this subregion. Peak numbers during all years (1991-2005) occurred in the second half of the winter and spring migration period (numbers in February-April on average 3-4 times higher than in the period November-January). In 2004/2005 and 2005/2006 data on diver numbers and distribution were collected for a larger area, including the nearshore and offshore areas from the dikes up to 10km offshore. Furthermore, detailed observations on behaviour and flights were made from the coast. Maximum numbers in the total area were between 1,100 and 1,500 birds. In the offshore area of the Voordelta the largest numbers were present in the first part of the winter (November-January). This might be related to the abundance of potential prey like small pelagic fish, although the information on diet choice of Red-throated Divers occurring in this region is still limited. In the coastal shallow areas the majority of the birds seem to be related to the gullies, so with the deeper waters, where they tend to occur later in the season, possibly because fishes move inshore for spawning. Indications were also found that turbidity and/or strong tidal currents during low tide played a role in the distribution pattern in the offshore area. During the aerial surveys which were mainly carried out during low tide, several times almost complete absences of birds were found in some of the offshore areas. During ship-based counts, carried out during different tidal phases, this was not the case. During low tide large fields of high turbidity occurs in these areas due to the erosion of the sand flats. At the same time, due to the tide, the areas become relatively shallow and the speed of the water current is high here, which also makes these areas unsuitable for efficient foraging. In addition to the tides, wind plays a role in the occurrence of Red-throated Divers. During situations with winds blowing from

land, the highest numbers were found in the sheltered shallow coastal areas. The lack of tailwind in this situation might stimulate migrant birds to stop over in the area.

References

- Poot M.J.M., C. Heunks, H.A.M. Prinsen, P.W. van Horssen and T.J. Boudewijn. 2006. Zeevogels in de Voordelta in 2004/2005 en 2005/2006. Nulmeting in het kader van Monitoring en Evaluatie Programma, Project Mainport Rotterdam – MEP MV2; Perceel 4: Vogels. Rapport 06-244, Bureau Waardenburg bv, Culemborg.
- Verdaat J.P. 2006. Gebiedsgebruik, gedrag en verstoring van Roodkeelduikers (*Gavia stellata*) in de Voordelta. Afstudeerproject ter ondersteuning van de Nulmeting in het kader van het Monitoring en Evaluatie Programma, Project Mainport Rotterdam PMR-MEP MV2. Rapport. Bureau Waardenburg bv, Culemborg.