

NEW FEEDING TECHNIQUE OF GREAT
CORMORANTS *PHALACROCORAX CARBO*
SINENSIS AT BEAM TRAWLERS
NIEUWE FOERAGEERMETHODE VAN AALSCHOLVERS
GEASSOCIEERD MET DE BOOMKORVISSERIJ

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*Since the mid 1980s, following a marked range expansion and dramatic population growth, continental Great Cormorants *Phalacrocorax carbo sinensis*, increasingly use Dutch coastal waters as a feeding area. Fishing Great Cormorants are now commonly seen at sea within 15 km of the nearest coast and small numbers disperse further out to sea. Small beam trawlers, mainly targeting Brown Shrimp *Crangon crangon*, are the dominant fishery of these waters and Great Cormorants were soon seen to attend these vessels. Recent observations indicate that, in contrast to other ship-following seabirds, Great Cormorants forage continuously during the towing of nets, even when no discards are produced on board. It is suggested that these birds prey on disturbed fish or other prey, just behind the moving nets that rupture the bottom. This feeding technique has not previously been observed in any species of seabird in the North Sea.*

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The continental race of Great Cormorant *Phalacrocorax carbo sinensis* typically inhabited inland wetlands in The Netherlands during most of the 20th century (Van Eerden & Gregersen 1995). The population increased from 4500 pairs in 1978 to 20 000 pairs in the early 1990s, while the number of colonies increased from five in 1978 to 27 in 1993. New colonies became established along the coast (e.g. Lok & Bakker 1988; Leopold & Van den Berg 1992; Camphuysen *et al.* 1995a; Van Dijken 1997; Koks & Hustings 1998) and several of these showed exponential growth. As a result, all recent accounts of the distribution and abundance of Great Cormorants in Dutch coastal waters are now inadequate and outdated (Platteeuw *et al.* 1994; Baptist & Wolf 1993; Camphuysen & Leopold 1994; Stone *et al.* 1995; Leopold & Camphuysen 1998; Camphuysen &

Leopold 1998). At present, Great Cormorants are particularly abundant between April and September, mainly within 15 km of the coast and in smaller numbers further offshore.

Since the mid-1980s, when Great Cormorants became common in the coastal zone, seawatchers have observed these birds in association with fishing vessels (Van der Ham pers. comm.). The first reported cases suggested that perhaps one or two birds attended some of these vessels, but later accounts indicated that Great Cormorants showed structural interest in beam trawlers working Dutch coastal waters. Sightings of tens of cormorants per trawler were reported and were assumed to be feeding on discarded fish along with other scavengers (mainly *Larus* gulls).

During a cruise on board sailing vessel *De Ruimte* on 12 June 1999, the feeding behaviour and foraging distribution of Great Cormorants was studied in detail off the mainland coast of Noord-Holland. Up to at least 50 cormorants attending a small beam trawler towing its gear, also being followed by several hundred *Larus* gulls and some Common Terns *Sterna hirundo*. At the time of the observations, the towing trawler was not sorting fish from the previous catch and was therefore not particularly attractive to scavengers. Typically for such conditions, the gulls and terns followed at some distance and height in a large loose flock. The cormorants, however, were very active. Birds were seen flying towards the beam trawler, landing in its wake and diving. Surfacing birds at some 500 m behind the vessel would take wing, fly towards the trawler again, land and dive. Surfacing and diving cormorants were visible in a broad path in the wake of the trawler and new flocks of birds arriving from several directions immediately joined the frenzy. There was no doubt that the birds were fishing successfully, given the head-up postures with extended throats of surfacing birds. As the trawler did not produce fishery waste, the birds must have been targeting alternative prey. A similar sighting, of seven Cormorants feeding in the wake of a towing shrimp, followed by nearly 500 non-feeding *Larus* gulls, was reported shortly afterwards (M.F. Leopold pers. comm.).

Shrimpers (or shrimp beam trawlers) of the 70-191 kW fleet operate 7 or 8 m beams on either side of the ship (Fig. 1), a vertical net opening of 0.5-0.65 m, a total gear mass of c. 760 kg on either side and a towing speed relative to the bottom of 2.5-3 knots (Lindeboom & De Groot 1998). Just in front of the net, a heavy chain loaded with 30-32 bobbins of modified rubber (210 mm diameter) rolling over the bottom is designed to chase Brown Shrimp *Crangon crangon* up from the sediment, most of which end up caught in the net. Beam trawlers targeting flatfish use heavier gear and have tickler chains in front of the net dragging through the bottom. The smaller type (191- 221 kW subfleet; including Eurokotters), also common in coastal waters, have an average towing speed of 3.6-4.5 knots and often operate 9 m beams with a total mass of 3900 kg

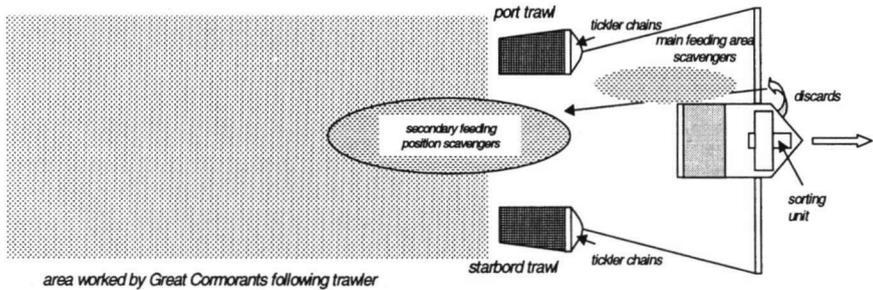


Figure 1. Schematic representation of towing beamtrawler or shrimper, showing port and starboard trawls, sorting unit, discards release, main and secondary feeding area for scavengers, and trail area worked by cormorants (see text).

Figuur 1. Schematische weergave van een vissende boomkor- of garnalenvisser, met het bakboord en stuurboord vistuig, de plaats waar vis wordt gesorteerd en waar ondermaatse vis (discards) in zee valt, de belangrijkste en secundaire posities voor visafval etende vogels en het kielzog waarin aalscholvers tijdens de trek actief zijn (zie tekst).

on either side of the ship. Both gear types disrupt the bottom to a certain extent, stirring up bottom dwelling organisms that will partly escape on either side of the gear. The result is a path of (partly) damaged organisms that is known to be harvested by benthic scavengers such as Common Starfish *Asterias rubens* and Hermit Crab *Pagurus bernhardus* (Fonds 1994), but fish that are only disturbed or escape are assumed to survive. There is little doubt that many of these will be rendered available in this path behind a shrimper or beam trawler and the observations of the foraging cormorants suggest that these birds target such prey. If so, the cormorants exploit a source of food that was not previously harvested and add (indirectly) to the fishing mortality caused by beam trawlers.

In order to obtain a better idea of the scale of use of small beam trawlers by foraging cormorants and to gain insight into their feeding techniques, documented sightings of foraging cormorants associated with beam trawlers are needed. In particular, information about the behaviour and foraging positions of cormorants in relation to the production of discards by the ship would be valuable. The latter can be deduced from the behaviour of other scavengers and from the position of the beams of the trawlers. Towing vessels



Aerial view of towing beam trawler *luchtfoto van boomkorvisser tijdens de vistrek*
(C.J.) Camphuysen)

steam rather slowly, have lowered beams (nearly horizontally), with visible ropes, leading diagonally into the water behind the ship, and are often followed by seabirds. When the ship is sorting the previous catch during towing, some crew members are usually visible on deck and scavenging seabirds will form a feeding frenzy on one side of the ship and also in its wake (Camphuysen 1993b; Fig. 1). When there are no discards produced, gulls and other seabirds will follow at some distance in a loose flock and only occasionally dive to pick up something from the surface of the sea. Other activities of these vessels are net cleaning (steaming full speed with open nets dragged through surface waters), lifting the net (ship stationary, nets being hauled in), or just steaming (steaming full speed, nets on deck, beams upright). Routine information such as date, time, location, number of birds attending, position and behaviour of the cormorants should also be recorded.

Apparently, in the course of a successful adaptation to a new environment and a new prey spectrum, the continental Great Cormorant has developed a new foraging technique, entering a niche that was not previously

occupied by seabirds. Few authors have reported the presence of cormorants or Shags *Stictocarbo (Phalacrocorax) aristotelis* behind fishing vessels (e.g. Hillis 1971; Camphuysen 1993a), and very few were reported during extensive studies of the use of discards by seabirds in the North Sea (Camphuysen *et al.* 1995b). Ewins (1987) described how Black Guillemots *Cepphus grylle* swam or flew into the area behind hauling trawlers and suggested that these diving auks preyed on fish escaping from the net. Otherwise, deep-diving seabirds are not normally seen around fishing trawlers, and if the explanation of the observed behaviour is correct then this is a new phenomenon that is unique to beam trawling.

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SAMENVATTING

De continentale vorm van de Aalscholver Phalacrocorax carbo sinensis was in Nederland tot voor kort vooral een viseter in de binnenwateren. Nadat de populatie sinds 1978 snel in omvang is toegenomen vestigde de soort zich ook in de kustwateren. De afgelopen jaren zijn de aantallen langs de kust zo sterk toegenomen dat geen verspreidingsatlas nog een adequate beschrijving van hun voorkomen geeft. Zetrektoellers constateerden al snel dat Aalscholvers belangstelling vertoonden voor garnalenvissers en kleine boomkorvissers langs de kust. Tijdens een zeiltocht voor de Noord-Hollandse kust ontstond de mogelijkheid om zo'n groep Aalscholvers wat beter te bekijken. De dieren bleken in het kielzog te foerageren terwijl de trawler zijn netten over de bodem trok, maar geen visafval overboord zette. De overige scheepsvolgers deden daarom weinig anders dan 'meevliegen'. Geattendeerd op dit geval hebben andere waarnemers hetzelfde een week later gezien bij een garnalenvisser voor de Hollandse kust. De waarnemingen suggereren dat de aalscholvers profiteren van opgejaagde of misschien juist ontsnapte of licht beschadigde vis, vlak achter de netten, in het veruineerde pad dat zo'n trawler op de bodem achterlaat. Dit is tevens een oproep aan waarnemers om het gedrag van Aalscholvers achter dergelijke vissersvaartuigen te beschrijven en te rapporteren. De Aalscholver lijkt zich in korte tijd met succes te hebben aangepast aan een nieuwe omgeving, nieuwe prooien en zich zelfs nieuwe foerageertechnieken eigen te hebben gemaakt.

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