

Protocol for seawatch counts in the Netherlands



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Introduction

Seawatch counts have been a source of information on the occurrence of seabirds in the Netherlands for half a century. Around 1972, the Club of Dutch Seawatch Observers (CvZ, later incorporated into the Dutch Seabird Group) started reporting birds flying over the sea from the coast. Since 1974, volunteers have amassed several thousand hours of seawatching counts per year at dozens of counting stations along the Dutch coast. The data used to be recorded on paper cards with hourly totals (Camphuysen & van Dijk 1983; Platteeuw *et al.* 1994). Since approximately 2002, input via the website Trekellen.org has replaced this and has rekindled the counting effort. Around 2010, the 'old' data were also added to the online database, Trekellen.org (Camphuysen & Troost 2011).

From 2020 onwards, the seawatch data in Trekellen.org (Troost & Boele 2019) are used to describe the development of seabird numbers in the Dutch North Sea, as an addition to the monitoring by counts made from aircraft above the sea. The combined data are included in the national Network for Ecological Monitoring (NEM). Data quality in the NEM is assured by describing the measurement methods in protocols and through annual quality reports. This document describes the protocol for carrying out seawatch counts.

This protocol largely continues the methodology introduced by the CvZ since 1972, with some minor amendments, explanations and tips for observers. This also makes it useful as an introduction/manual for new counters. The protocol on the following pages is divided into six themes: Location and time, Equipment, Counting method general, Counting method specifics, Identification and registration, and Data entry. Concise instructions are given for each theme, with explanation, motivation and/or tips.

Objectives of seawatch counts

The aim of including seawatch counts in the NEM is to contribute to monitoring the development of numbers of characteristic species of marine and coastal birds in the Dutch North Sea. In addition, the counts may also contribute to various other goals (cf. Thaxter *et al.* 2011):

- describing temporal and spatial movement patterns of seabirds and shorebirds outside the breeding season,
- monitoring the breeding success of species (based on age group ratios),
- informing research, e.g. about factors affecting the occurrence and abundance of species,
- including those of species only rarely recorded in other observation schemes.

In addition to the points mentioned above that contribute to knowledge and (nature) policy, experiencing and enjoying bird migration 'in the field' and seeing bird species that are rare or not easily observable at other locations are also important goals for volunteer observers.

	Instruction	Explanation and/or motivation
Location and time	Location and time	
	Count from a stationary position along the coast, preferably at a frequently occupied site.	Seawatch counts can be done anywhere along the coasts, but for assessing trends in abundance and other analyses, the data from sites frequently occupied over many years are the most informative. Only for sites where counts are made with a certain minimum frequency and regularity can effects on the counted bird numbers of time (year) and weather conditions be properly distinguished from systematic differences in abundance between locations.
	Choose a slightly elevated observation point: 5-10 m above sea level is usually optimal.	An observation point low above the sea has the advantages that birds flying both near and far fly at a similar height in the image of the binoculars/telescope, and that more birds are seen 'above the horizon' where they are more noticeable. However, in the presence of sea swell flying birds will also quickly disappear into wave troughs, meaning they can be missed. A higher position is therefore preferable, especially in strong winds. Plumage patterns are also more visible against the background of the sea than against the sky. However, from a point that is too high, especially above a narrow beach, the closest (surf) zone falls under the field of view of the binoculars/telescope, causing birds flying there to be missed.
	Frequency and timing of counts are optional.	There are no regulations regarding dates and times of seawatch counts. However, counts that are regularly carried out from the same location, spread over the year and under different conditions (and, for example, not only during storms in September-October) are the most valuable.
	Record numbers per hour (or in smaller time units).	There is no prescription for the duration of counts, but divide (record) counts longer than 1 hour into separate hours, so start a 'new count' every hour. The start and end times do not have to coincide with a clock hour. Counts entered per hour are much more useful for analyses than totals over a day or part of the day. They make it possible to describe variation in bird numbers during the course of the day, and to correct for this in analyses focusing on other variables.
	Count with multiple observers if possible and record their number.	Counting with 2-4 people provides a more complete count. One observer can't see all the birds: some pass behind wave troughs, just above or below the image, or while attention is briefly focused elsewhere. It is therefore also important to mention the number of counters when entering data.
Equipment	Equipment	
	Optical aids: telescope or binoculars on tripod.	<p>Birds at sea often fly far away; sufficient magnification is important for discovery and determination. 12x is a minimum; optimal is 15-25x; above that, the small angle of view often becomes a problem.</p> <p>A tripod or other fixed surface provides a stable image, which is essential for seeing birds clearly and preventing eye fatigue.</p> <p>Binoculars usually have lower magnification (15-20x) than telescopes (from 20-30x) but offer a larger and quieter image; watching with two eyes is also less tiring. The advantage of telescopes is the ability to zoom in on certain birds for identification.</p>

	<p>Registration tools: tally counter, Trektellen app, dictaphone.</p>	<p>Tally counters (e.g. with 3 or 4 buttons) are very useful for recording numbers of species frequently flying by individually or in small groups without having to interrupt your viewing.</p> <p>For the other species, with some experience, input into the Trektellen app on a mobile phone works faster than writing. Buttons for the most frequently entered species automatically appear at the top of the list on the screen. Starting a new count after an hour is also easy; header data (weather conditions, counters) are copied automatically but can also be edited.</p> <p>Speaking into a dictaphone is another way to maximize the effective observation time. By pausing the recording between entering observations, listening to it afterwards takes less time.</p>
<p>Counting method general</p>		
<p>Counting method general</p>	<p>Look more or less continuously through binoculars/telescope.</p>	<p>Look (almost) continuously through binoculars/telescope, aimed at the horizon, roughly at a right angle to the coast. Also keep a patch of sky in view, to not miss higher-flying birds.</p> <p>Birds can be missed while looking around and recording observations; if there is a lot to write this can be substantial. If there is more than one observer, this is compensated by the others. Solitary counters can maximize effective viewing time through recording methods that require less time than writing (see Registration tools).</p> <p>Depending on the observation position and the circumstances, it is advisable to additionally regularly scan the higher air layers and/or the surf zone with binoculars or the naked eye. One of the observers present can do this, for example.</p>
	<p>Count all species (land birds optional).</p>	<p>All birds flying over the sea are relevant; in any case, count all seabirds, waterbirds and birds of prey. Counting of other landbirds is optional.</p> <p>At some sites, large gulls and/or cormorants are not counted, because foraging flights from local breeding colonies or the passage of gulls over the foredune can be so massive that counting them interferes with the registration of other species. It is important to carefully record which species have not been counted (see Data entry).</p> <p>At some counting sites, land birds (songbirds) migrating over the sea and/or foreshore are also counted. This is optional. Combining a seawatch with a visual migration count for songbirds is generally not recommended due to differences in methodology and because counting all passing birds above both sea and land is often only feasible with at least 3-4 observers. It is preferable to record numbers passing over land and at sea as different (possibly simultaneous) counts.</p>
	<p>Also count marine mammals.</p>	<p>Registration of observed marine mammals (cetaceans and seals) is very desirable and useful. Treat them as if they are birds.</p>
	<p>Register all types of flight movements over sea.</p>	<p>All types of flight movements count, not only long-distance migration but also foraging flights, corrections for tidal drift, etc. It is usually not possible to see in the field which type of flight is involved.</p>

	Count flying birds in two directions: left and right.	Usually, the vast majority of flight movements are directed more or less parallel to the coast. Left is south and right north along the Dutch mainland coast, but elsewhere this will of course vary with the orientation of the coastline.
	Count resident (local) birds as well.	Record waterbirds swimming at sea (divers, grebes, (sea) ducks, razorbills, etc.) separately, even if it is only an indication of presence ('+', see Data entry). Registration of gulls swimming at sea and/or staying on the beach is optional. Birds resident on site ('local') are sometimes difficult to count and the interpretation is also less clear (which area; snapshot or sum of birds floating past?). For this reason, local birds are not included in the calculation of trends. However, registration can be valuable for other purposes. For groups of gulls and terns foraging above the sea, see 'Methodology specific' below.
Counting method specifics		
Counting method specifics	Larger groups: estimate.	Usually in seawatch counts, the margin of error caused by missing groups or individual birds is larger than that resulting from counting errors in the number per group. It is therefore better to estimate the number of birds in larger groups, for example by measuring sets of 5 or 10 birds, than to follow them for a long time for an exact count.
	Dealing with intensive migration.	Sometimes such a continuous stream of birds of one or more species can fly by that it becomes difficult to keep up, and/or this would impede the registration of other species. It may then be considered to count this species during limited sample periods (e.g. of 5 minutes, preferably more than one) and extrapolate to an hourly total. In extreme cases, a rough estimate of the total number may also suffice (please indicate this under comments when applicable).
	Groups of gulls and terns foraging at sea: N and S.	Gulls and terns sometimes form groups or 'bands' of birds flying and foraging above the sea. If they do not or hardly move in a specific direction, it seems logical to record them as 'on site'. Because resident birds are not included in the calculation of trends and in the analysis tools on Trektellen.org, it is better however to divide the estimated numbers in such groups equally over the two flight directions.
Identification and registration		
Identification and registration	Experience matters.	One or more seasons of experience with making seawatch counts in the company of others, is recommended before independently submitting counts. Seabirds often pass a considerable distance from the coast and several species look very similar. Flight modes can change under the influence of (wind) conditions and variation in light can have a major effect on the appearance of species, even within the time frame of one count. Experienced observers are familiar with this.

	Recording age and sex: valuable if possible.	Recording age / sex / color phase of passing birds is optional but very valuable. It allows intraspecific patterns of migration and occurrence to be described, and can be informative in interpreting population trends (e.g. a decline in the proportion of first-year birds may indicate reproductive problems). Some plumages are easier to recognize than others at a great distance or with moderate visibility (e.g. adult vs. immature Northern Gannets), which can cause them to become overrepresented in the data. Take this into account by only recording age and/or sex for birds that would have been recognizable in all plumages.
	Leaving birds unidentified is not a bad thing.	Even for experienced observers, species identification sometimes remains difficult. When in doubt, use the 'spec' categories, such as skua spec, sandpiper spec etcetera.
	Difficult species pairs: use the 'combination species' for unidentified birds.	The species pairs of Red-throated / Black-throated Diver, Arctic Tern / Common Tern and Razorbill / Common Guillemot are often difficult to distinguish in the field. That is why 'combination species' have been defined in the data input application. Among divers (in the winter months) and terns (in late summer), one of the two species is so much more numerous (in the Netherlands) than the alternative that some observers record all birds counted as Red-throated Diver or Common Tern respectively, based on the idea that this closely approximates reality and is more informative than the combination species. The first is true, the second is not! Only if just the birds actually identified are recorded by species the counts will provide useful information about the abundance ratio between the species. So, note down what you actually saw and could (or could not) identify. (Tip: with the Analysis tools on Trektellen.org, the total of [combination species + speciesA + speciesB] can also be displayed in graphs, maps and count records; for example, choose 'Arctic Tern/Common Tern total'.)
	Annotate sightings of scarce and rare species.	For notable observations, briefly describe the characteristics on which the determination was based in the Comments field, or refer to another place where this is done (such as eBird, Ornitho, Observation). This applies to rare species and scarce species outside their regular migration period or that are difficult to identify. Photos can be added to the Trektellen site.
Data entry	Data entry	
	Input via the Trektellen.org website or the Trektellen app.	You can enter data via the website www.trektellen.org or with the linked apps Trektellen for Android or iTrektellen for Apple.
	To enter counts, an account and approval from the site coordinator is required.	Entering results is coordinated by local contact persons. New observers and new locations can be registered with the national coordinators . If you have questions about a specific counting station, you can contact the local coordinator directly via the information page of that location on Trektellen (example).
	Header data.	During input, header data is entered for each count (observation hour): date, start and end time, type of count (= 'seawatch'), weather conditions, observers (number and names) and any comments about the circumstances, sources of disturbance at sea, special observations, etc.

Species entry via website.	The website input page for species and numbers shows a list of species set by the survey station coordinator; additional species can also be entered. Fields for details regarding age, plumage, etc. can be collapsed or expanded. When the entry is complete, the count is published via a button after which it appears in the overview on www.trektellen.org .
Species entry via Trektellen app.	With the Trektellen app, species, numbers and plumage details can be entered in the field, after which they can be uploaded to the database. They will then be published immediately. A video instructions on using the app can be found on Youtube .
Always clearly indicate species that are not counted in the standard list or with '+'.	Species that are never or rarely counted at a particular site can be designated as such by the site coordinator (via 'site management – species not counted'), after which they are automatically treated as not counted in the database. For species that are normally counted but not during a specific count, even though they have been observed, '+' must be entered (for each hour). When data are entered in the app, this must be done afterwards, via the website. If nothing has been entered, analytic operations (such as calculating hourly averages) assume that the species has been counted but not seen. Therefore, set the count type to “incomplete” if, for example, the common species have not been counted at all.
Sources of disturbance.	At some counting sites, potential sources of disturbance for seabirds are recorded: water recreation, shipping and sometimes low-flying aviation. When entering via the website, the 'Disturbance' button can be used for this in the header data. Alternatively, or when entered via the Trektellen app, sources of disturbance are listed in the Comments field: type of disturbance source, distance to the coast, and any disturbed birds.

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