

## Introducing online tools to give feedback to the volunteers, volume 2: Dutch breeding bird monitoring program

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Keeping volunteers motivated and happy is a key aspect in long-term monitoring schemes that use citizen science. Regular feedback is an important way to increase the motivation of the volunteers. The feedback can include published reports and (online) meetings with presentations, but also online tools where volunteers can look at a variety of scheme results for themselves. Technical advances have enabled various online feedback options. The aim of this Bird Census News article series is to introduce various national versions of these online feedback systems, which hopefully can help national coordinators to develop their own systems. In addition, the articles will provide brief introductions to a range of bird monitoring schemes and also enable the reader to explore potential changes in bird populations in various areas. This article, the second contribution in the series, is in-

troducing the Dutch breeding bird monitoring program (BMP), which is coordinated by Sovon Dutch Center for Ornithology together with Statistics Netherlands.

The scheme has been running since 1984. It is based on intensive territory mapping in fixed study plots. Fieldwork and interpretation methods are highly standardized and are described in detail in a manual. Territory mapping uses a high number of field visits (5–10 between March and July), consistent between years. The size of study plots, as well as exact number, timing and duration of visits, depend on habitat type and species selection (either all species or a fixed selection of scarce/rare species). All birds with territory-indicative behaviour (e.g. song, pair bond, display, alarm, nests) are noted down in the field on maps, since 2016 by using the mobile app 'Avimap'. Species-specific interpretation criteria

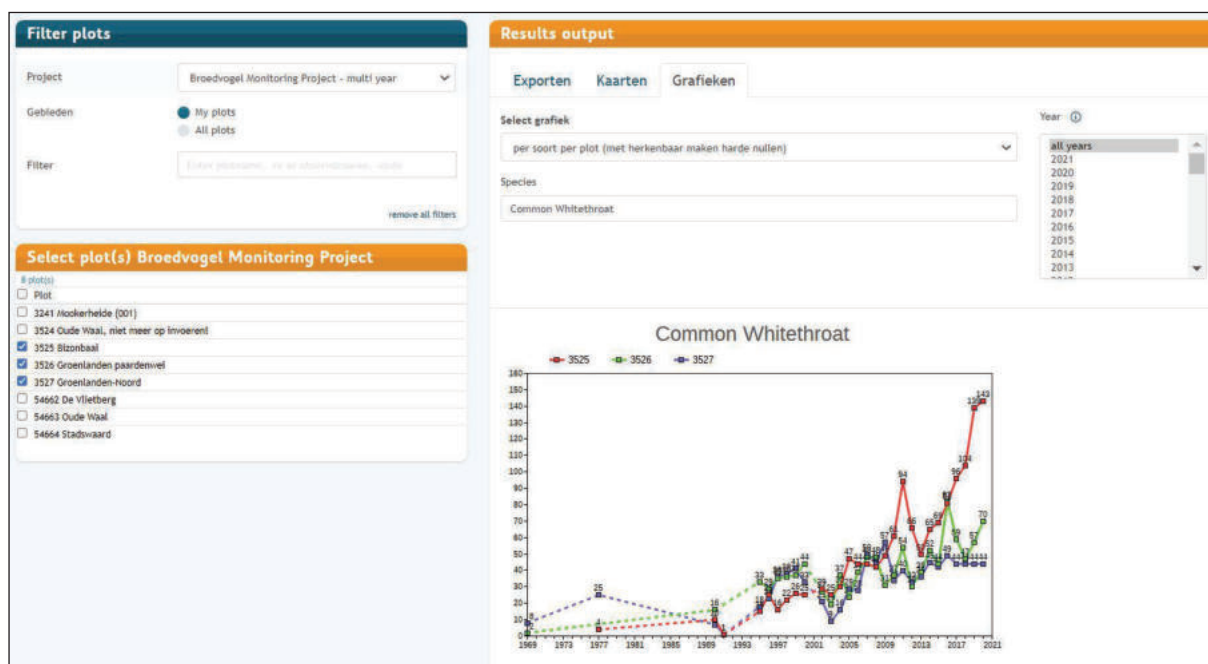


Figure 1. Change in number of Common Whitethroats *Sylvia communis* in three BMP study plots since 1969. This species has increased in most parts of the Netherlands, most strongly in rehabilitated river floodplains where farmland was phased out and replaced by natural river dynamics and semi-natural grazing (plot 3525).

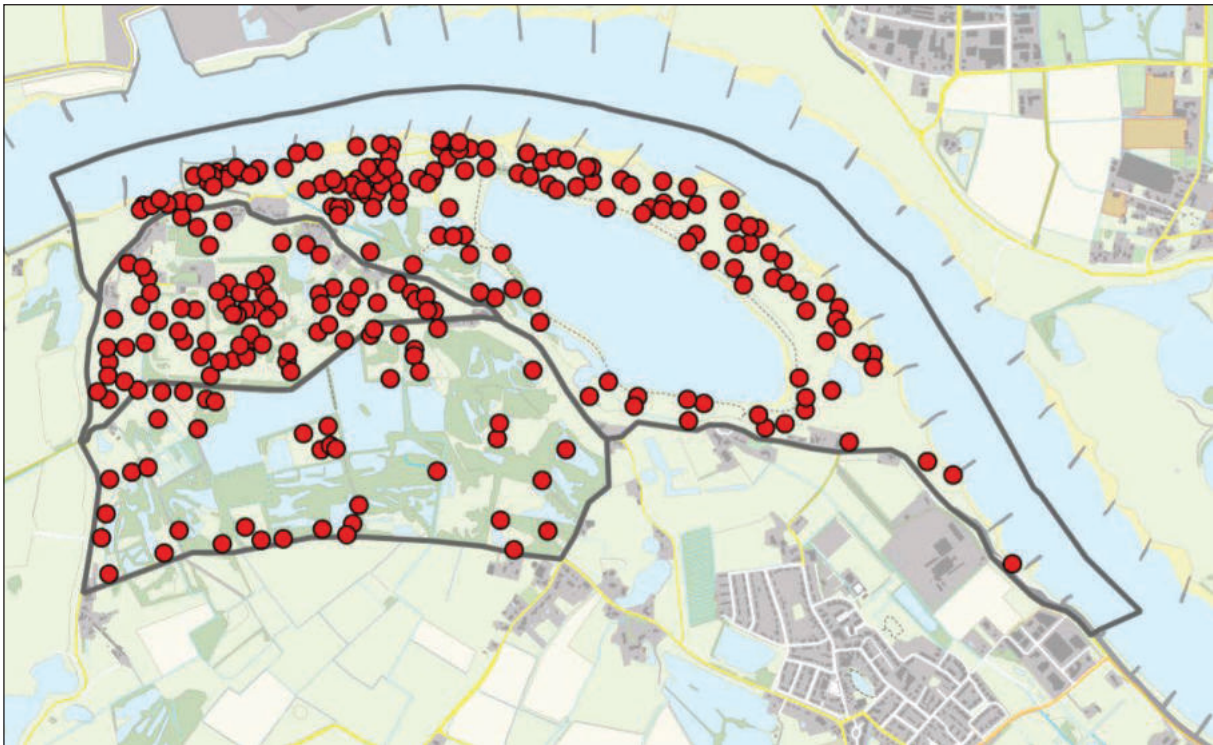


Figure 2. Distribution of Common Whitethroats *Sylvia communis* in three BMP study plots in 2020 (n=257).

are used to determine the number of ‘territories’ per species at the end of the season. Interpretation criteria focus on the type of behaviour observed, the number of observations required (taking into account the varying detection probability between species and within the breeding season), and the period of observations (to exclude non-breeding migrants). Since 2011, the clustering of observations into territories is completely automated within the program ‘Autocluster’. The number of BMP plots grew from around 300 per year in the mid-1980s to around 2,000 in recent years.

Results of the BMP are communicated with volunteer participants, stakeholders and the general public by open-access annual reports (e.g. <https://www.sovon.nl/nl/publicaties/broedvogels-nederland-2019>) and online information (<https://www.sovon.nl/vogelinfo>), presenting trends at the national, regional and local (Natura 2000 sites) scales. In recent years we have been extending the possibilities for participants to ‘play around’ with the results of the censuses in their own study plots. In this way, we give our volunteers direct and easy access to their private data for customized exploration and reporting. Also, we enable them to visualize their results and share them with co-workers, regional

coordinators and managers/owners of the sites which they have been granted access to (nature reserves, farmers, agri-environment groups), if they wish to do so. This detailed type of feedback also contributes to detect previously hidden errors in the data (typos, incorrect zero or missing counts), in addition to other validation procedures.

At present, we offer the following online tools, which are available after logging in with one’s personal Sovon-account (screenshots shown in Figs 1–3).

1. Exports of count results to Excel- and GIS shape-files, per study plot or for more study plots combined.
2. Graphs of the number of territories per species per year (Fig. 1).
3. Maps of the distribution of territories, per year or range of years, per species (Fig. 2) or group of species (Red-Listed species, ‘ecological groups’, Fig. 3).

This online feedback appears to successfully meet a need, and is increasingly used by our volunteer participants and reserve managers. We try to include their suggestions for additional features as much as possible.

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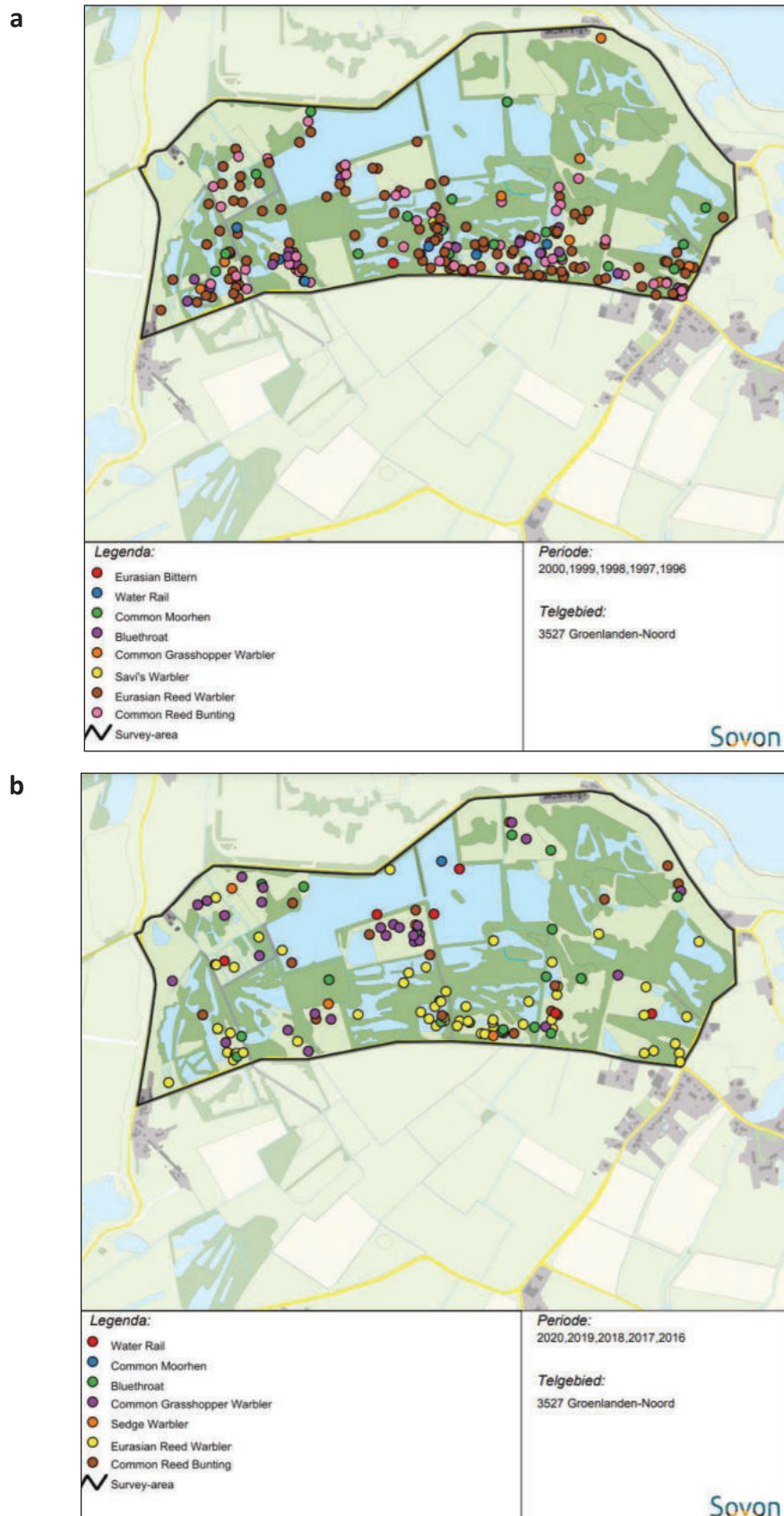


Figure 3. Distribution of ten breeding bird species characteristic for reed marshes in BMP study plot 3527 in a) 1996–2000 (n=222 territories) and b) 2016–2020 (n=130). Different species are indicated by different colours. This marshland plot was affected by desiccation and vegetation succession. As a consequence, Bittern *Botaurus stellaris* and Savi's Warbler *Locustella luscinioides* have disappeared since 2000, Great Reed Warbler *Acrocephalus arundinaceus* already did before 1996. Most other species have decreased in numbers, apart from Grasshopper Warbler *Locustella naevia* (orange in a., purple in b.), which is also occupying the drier parts the study plot.