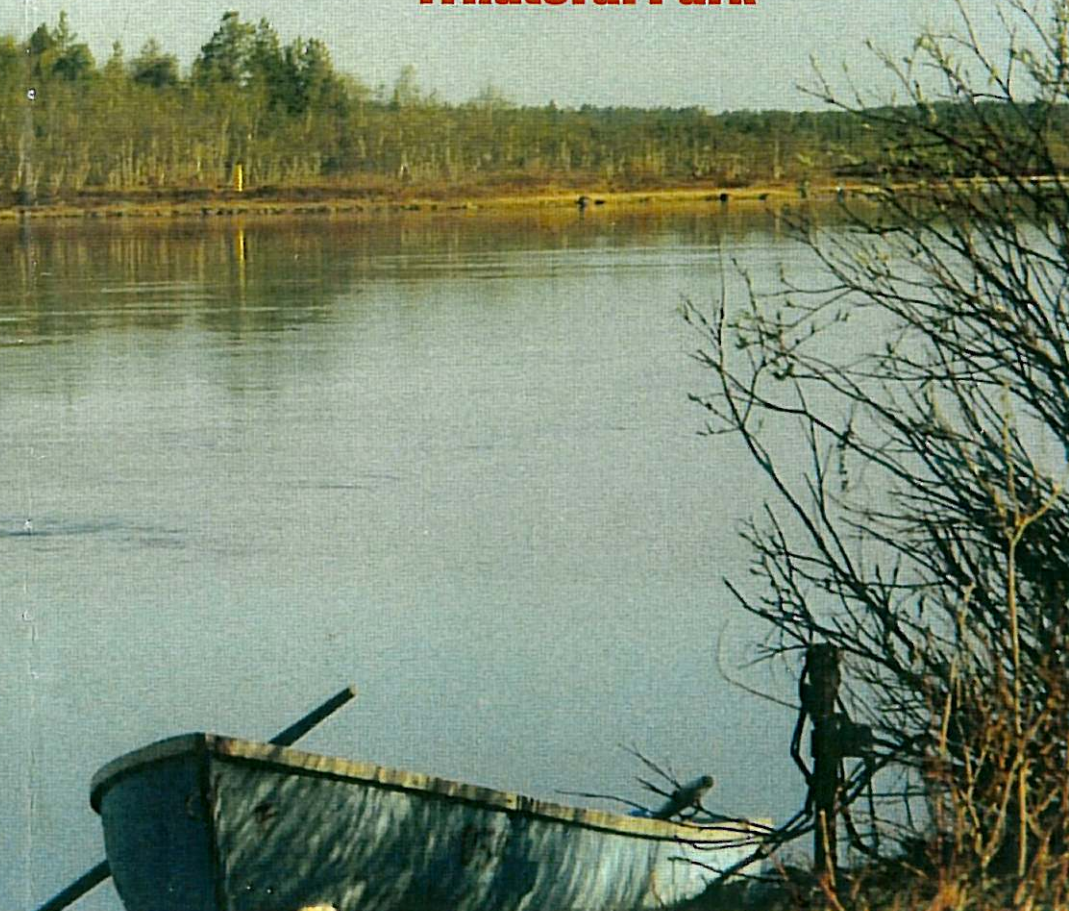


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of waterfowl counts
in the Pasvik-Inary
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E. I. Khlebosolov, ed

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Unified methodology of waterfowl counts in the Pasvik-Inary Trilateral Park

The aim of waterfowl counts is to define species composition, population number and spatial distribution of waterfowls in the Pasvik-Inary area both for breeding species and for species using the area for resting during their migration. Annual repeating of the counts provides comparable data for a long-term monitoring of bird populations and their environments.

Target areas of counts

Waterfowls prefer water areas distinguished by their size, depth and degree of overgrown. Therefore, different types of water areas (rivers, reservoirs, large lakes, small lakes, marshes) are selected for counts proportionally to their ratio in environments. If the water area is significant in size and morphologically non-uniform (overgrown shore line, large areas of shallow water, open water on the middle of river or lake, etc.) it is better to survey each homogeneous site separately. On the river Paz several zones which differ among themselves by habitats, living conditions and, accordingly, by species composition of waterfowls are allocated.

Subjects of counts

During the counts only those bird species are registered which (a) are on the water; (b) are feeding on the shore line; (c) are feeding in air over the water; (d) are flying over the water in searching for food; (e) are in the middle and on water vegetation. All loons, grebes, cormorants, swans, geese, ducks, divers, ducks, grebes, waders, gulls, terns and waders are counted. Birds which occur in the river flood-lands and on the shore vegetation but not connected with water usually are not registered. Although some of them (birds of prey, herons, cranes, etc.) may also be

counted. Broods can be counted in the same areas as nesting birds by using the same method (Isakov, 1963).

Time of counts

On one target area the count will be conducted (1-2) times in the late spring. The timing depends on proceeding of the summer but in the Pasvik area the first period is usually timed between 20.-30.5., and the second between 30.5.-7.6. Count of broods should be conducted during 1.-20.7., depending on the area location. To maximize the comparability of the results the count should be repeated during several years using: (a) same target areas/points; (b) same observer; (c) good weather; (d) same period (in relation to the proceeding of the spring); (e) same practices (Koskimies, Vaisanen, 1988).

Instructions for field work

The waterfowls are counted either by circulating the whole water close to the shore by boat or by foot or from stationary observation points. The choice of counting method by boat or by foot depends on a type of water area, degree of shore broking, counting distance, and is determined by convenience for the counter. The foot counts are usually carried out on small water areas. The boat counts are used more often on large lakes, rivers and reservoirs. Good results gives the combined method when during the circulating count by foot or by boat the counter stops for a short while at the stationary observation points and examines places of high concentration of birds on the open water surface.

It is necessary to survey not less than 10 km of a shore line. On the routes of large extent the results for every 10 km section of route can be written down separately. The walking or driving distance during the count is determined with help of a map or by the duration of count. The whole area is counted with paying special attention to bays, ditches, reed beds

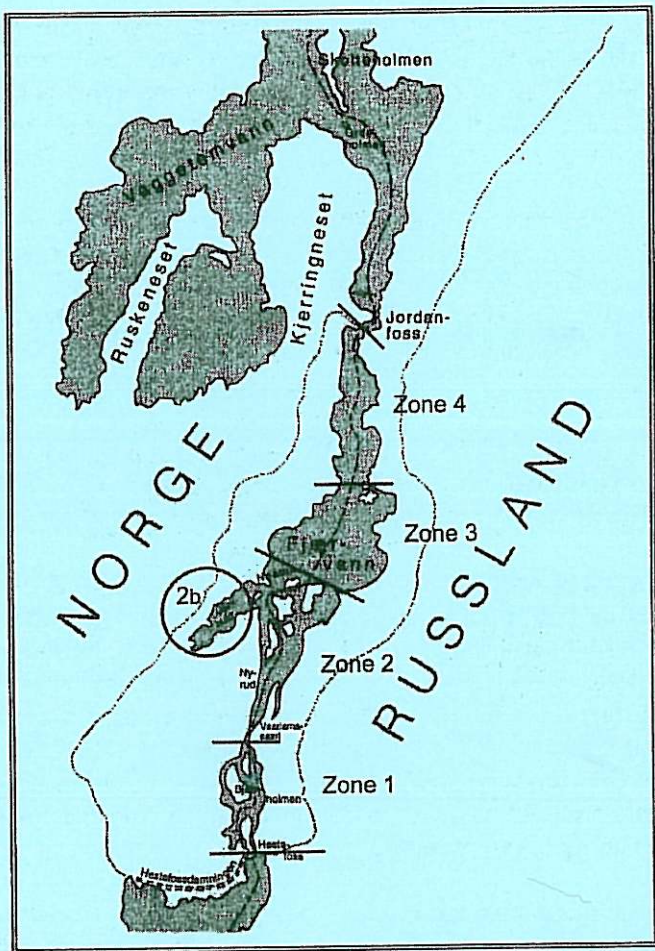
and other areas that are favoured by waterfowls. If the area can be reliably checked from a distance it does not need to be visited. Special attention should be paid on birds swimming or flying. Their directions should be marked on the map to avoid duplex registrations.

The count is conducted in good weather conditions preferably in the morning (6-13) when the wind and light conditions are at their best. The counter should minimize the disturbance when arriving to the observation points. Other requirements are: (a) a stable counting sector should be easily defined by stable landmarks; (b) the visibility of the sector should be clear; (c) the counter should be able to identify all species on the sector by using binoculars or telescope; (d) the point is possible to access in all weather conditions (Koskimies, Vaisanen, 1988).

There are several peculiarities of waterfowl counts on the large lakes, for example on the Inary Lake, and on the frontier river Paz.

Circulating counts on the large lakes. On large lakes the count needs to be done by boat. For the areas are large also the time needed increases. The whole area may be counted or only a part of it. A good way to define the area is to choose a relevant part of the lake (bay, cape etc.). The area is divided into sections according to the vegetation and shore type each of which represents a typical habitat. The count proceeds step by step along a predetermined route from which the water areas, shores and islands may be checked carefully. All observations are marked on a map. Special attention should be paid on not counting the same individuals several times.

Circulating counts on the river Paz. The annual counts of water birds in the common area of Pasvik Zapovednik and Pasvik Nature Reserve have mainly been carrying out in the same manner since 1994 (Map).



Map of the monitoring area for waterfowls in the common area of Pasvik Zapovednik (Russia) and Pasvik Nature Reserve (Norway)

The area of investigation is the Pasvik River from Hestefoss to Jordanfoss, including Gjokbukta, Fjarvann and the bays and lagoons on Russian side. The area is divided into four zones on Norwegian and Russian sides (Map). The registration starts in the southern end (downstream of Hestefoss), and ends at the brink of Jordanfoss.

Two counts are conducted in spring and one count in autumn. Usually the two spring counts are made by 3-6 days in between, in the period 25th May to 12th June. In autumn, mainly in the timeframe 8th - 16th September, the count is carried out only by one boat on Norwegian side. Count date in autumn can be changed to avoid unfavourable weather conditions.

The count is made as one continuous transect, but with stopping points to view large water surfaces with high density of birds. During the count all waterfowl species are identified by view or by sound.

The transportation is carried out by small boats (12-14 feet long) equipped by with a small outboard engine (10 hp) and subsequently by oars. In each boat there is one driver and at least one bird observer, most preferable is one observer from each country. The optimal registration is made by two boats driving parallel one along Russian side and one along Norwegian side of the border. Each boat registries all birds have being noted at the respective side of the border. During the boating handheld binoculars are used, while at the stopping points binoculars and telescope mounted at tripods are used.

Since the border opening is a strongly managed procedure the count has to be carried out on date fixed long time in advance. Mainly the work starts at 0800 CET and terminates by 1600 CET, due to practical reason by the opening of the border. At starting, the border is opened at 0800 and the counting crew meets at Vaarlamaasaari to divide into the boats and briefing of the task. One of the main problems is to avoid double counting

(by the two crews in the boats). The boats must be synchronized in movement and the crews needs to discuss how to prevent double counting during the count. The count is normally made within 6 hours depending on water level, weather conditions and the occurrence of birds.

Registration procedures

When starting the counts a map of the area should be attached with clear markings of the route/points. From each count you should mark: name of the counter, the area counted (and the sector/square), date, starting/ending time of the count, weather conditions. The number of registered birds is writing down separately for different species. Number of pairs, single males and females, young birds, and if the sex and age is not determined are also mentioned. The registration of broods is made for different species and for three classes of age.

Calculation of bird population number

The methods of bird number calculation depend on type of water area. On rivers and large lakes the results of counts are usually referred not to the surveyed water area but to the length of counting route. In the counts without registration the distance of detection the recalculation of bird abundance is made in relation to certain length of a shore line, usually the number of discovered birds on 10 km of counting route is determined. On small lakes and marshes where it is possible to find out and to register practically all birds, recalculation is made in relation to 1 km² of the water area. For this purpose the number of registered individuals of each bird species is divided into the area of a surveyed site (Isakov, 1963).

If the count is carried out by boat from the middle of water area, and there is no opportunity to count all birds (owing to significant width of the river/lake or field of view limitation because of water vegetation), it is possible to register all discovered birds with the subsequent separate

recalculation of average distances of detection (Ravkin et al., 1999). For recalculation of bird number in the area (individuals on 1km^2) the formula is used:

$$K = \frac{40c + 10n + 3f + 1vmf + 0,5ef}{L \text{ (km)}}$$

where K - number of birds on 1km^2 , c- number of birds noticed at the moment of detection close (up to 25 м), n - near (26 - 100 м), f - far (101 — 300 м), vmf - very much far (300 - 1000 м), ef - extremely far (more than 1000 м), L (km) – length of counting route in kilometers. The detection distances are measured approximately by eye. The possible mistakes in reference some of birds to the appropriate group are leveled by the mass character of data. The distance of bird detection is determined in the moment when the bird was noticed by the observer first time (Ravkin et al., 1999).

If the count is carried out by the movement along the overgrown shore line the birds number is calculated on the same practices, but the mileage (number of kilometers) is divided in half as the count is made only on one side of counter movement line.

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The work is dedicated to description of unified methodology of waterfowl counts.

It is recommended for ornithologists, employees of nature reserves and national parks, biologists.

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Pasvik  Inari

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