

5 Archipelago Birds Census

Zoological Museum, Finnish Museum of Natural History
 Archipelago birds census / Zoological Museum
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1. BACKGROUND AND AIMS. Changes in seabird populations have been studied regionally in Finland since the beginning of this century. More intensive censuses would be needed at present, when environmental changes (pollution of the Baltic, oil catastrophes, increasing disturbance, the spreading of minks and raccoons, etc.) threaten the archipelagos and their birds. The present scheme started in 1984.

The primary aim of bird censuses in the archipelago is to monitor the annual changes in breeding populations of grebes, ducks, waders, gulls, terns, alcids and certain pas-serines in different parts of Finland, and to study the reasons for these changes. Monitoring is also necessary for nature conservation and game research.

The main monitoring method is to count parent birds and nests on selected study islands. Waterfowl may also be counted along standard routes by boat. – Instructions for censuses of birds in lake archipelagos are presented in Sect. 12 of the instructions for waterfowl round counts in Ch. 4b of this Manual.

2. EQUIPMENT AND TIME NEEDED. For bird censuses in the archipelago one needs binoculars, a pencil and notebook, and a boat suitable for sea conditions. A telescope may also be useful for searching for birds far away. All the nests found are marked in waterproof ink. The study area is marked on a detailed map (e.g., a survey map 1:20 000). If one counts waterfowl from a boat, enlarged visit maps are also needed to mark the observations.

The time needed varies according to the size and vegetation of the islands censused, distances between the islands, the power of the boat engine etc. A thorough search for nests and count of birds takes usually a little less than one hour on an island of one hectare; thus, one usually has time to census 10–15 islands per day. A group of observers is much more effective than a single person, especially when

counting colonies. Disturbance is also minimized by group work.

3. CHOOSING A CENSUS AREA. The size and location of the area is mainly determined by the amount of time available for censuses. One should therefore consider the size of the area carefully, so that the very same islands can be surveyed in a comparable way each year. It is recommended to divide the islands into two categories of importance: islands of group A (“core” islands: easy to census and representative of the nature and birds of the area) are monitored carefully in each census season, but islands of group B can be left uncensused in some seasons if time is short. However, at least Caspian Tern, Lesser Black-backed Gull and alcids, which are central species in monitoring, should be counted also on type B islands. It is better to census part of the area carefully and in a comparable way than to make a superficial count of the whole area.

It is an advantage if the area has “natural” boundaries such as open sea, coast or large wooded islands, since these are likely to reduce the effects of emigration/immigration on population estimates.

The census area should be uniform (all islands are censused) and consist of at least 15–20 separate islands or islets. On wooded islands only shores and other parts suitable for archipelago birds are usually included.

Nation-wide monitoring should cover all kinds of archipelagos: preserved vs. unprotected areas, undisturbed vs. disturbed, clean vs. polluted, islands invaded by minks and Herring Gulls etc.

4. CENSUS PERIODS. Three counts are recommended on each island during the breeding season. If there is a lack of time, two visits may be sufficient; on small islets with scanty bird fauna even one visit may be enough.

The most important group of birds for monitoring in the archipelago are the true coastal

species, the populations of which are censused carefully. Censuses should be made at the most representative period, taking account of the nesting season of these birds. The best time to count the nests is just before hatching of the earliest clutches, at which date even the late clutches most probably will have been laid. The best time to count the parent birds varies from species to species: in ducks it is just before or during egg-laying, in gulls and terns during incubation, in waders and passerines after hatching, in Razorbill and Black Guillemot at the end of incubation or after hatching.

In the Gulf of Finland the first count should be made in mid- or late May, and in the Bay of Bothnia in early June, to count the nests of Eider, Goosander, dabbling ducks, Herring Gull, Great Black-backed Gull and other early breeders. In the second visit 2–3 weeks later concentrate on the nests of *Aythya* species, terns, Common Gull and Lesser Black-backed Gull. During this visit some new nests of Eider, gulls and other early breeders that were overlooked earlier are often found. The third visit is made in the Gulf of Finland at the end of June, in the Gulf of Bothnia at the beginning of July. This time one should concentrate on waders (Oystercatchers are counted already in the first two visits), passerines and auks, together with the nests of Velvet Scoter and Red-breasted Merganser. During each count, however, the census-maker should make notes of all species and complete the data from earlier visits.

The optimal census period depends on the geographical location of the area, phenology of the spring, geomorphology and vegetation of the archipelago, together with the composition of the local breeding birds. The optimal period can be deduced from the gathering of waterfowl males into flocks and initiation of nesting. Furthermore, break-up of ice and the advancement of migration may be used as rough indicators. The census time should be kept phenologically as constant as possible from year to year.

If only a few species are censused, one exactly timed visit to the area may suffice. This should be mentioned when reporting the results (see Form 5D), and the routine kept the same during the years.

5. TIME OF DAY. Nests may be counted at any time of the day. The numbers of ducks and larids are counted most reliably in the morning

and in the evening, but not during noon or afternoon. Razorbill and Black Guillemot should be counted within 2–3 hours from sunrise.

6. WEATHER. Do not land on bird islands during cold, rainy or hot sunny weather. Warm days without too much wind are best for censusing.

7. FIELD WORK. The two main methods used on islands are nest searching and adult counting. The former is the most reliable method for the majority of duck and larid species, the latter for waders, auks and passerines. Counting of adults may also be used as a supplementary method for gulls, terns and ducks, when a thorough search for nests is not possible.

Before the census is started, the study area is defined on a survey map, and running numbers are given to the islands and islets. They should be divided into group A and group B, if necessary (see Sect. 3). The census is started in good weather and early in the morning; especially the islets where Razorbills and Black Guillemots breed should be visited just after sunrise. Auks may also be counted during a special survey, which is advisable particularly if there are a lot of islets.

Before landing, the date, time, name of the island, weather and observer name are recorded. While approaching the island waterfowl swimming near the shores are counted. One should also try to find out from the behaviour of the birds, whether they are actually nesting on that particular island or not. As soon as the boat has been secured, climb to the highest point of the island and count the adults using binoculars. One should not delay in this, because soon gulls from the nearby islands may join the flock around the observer. The birds are counted species by species, or a group of species together (e.g. waders, passerines). One should observe thoroughly different parts of the island, shore waters and birds circling in the air. On large islands one may have to use two or three lookout points or circle along the shores. While searching for nests, records of other birds, such as waders and passerines can be completed. If it is unlikely that a bird nests on the island (e.g. an obvious migrant), it should not be included in the records.

For the nest count the island should be divided into sectors either by natural landmarks (tree, bush, big boulder, water pool etc.) or by

artificial ones (plastic bands, sticks etc.). These sectors are surveyed by crisscrossing carefully but rapidly. Often it is advisable to search the shore zone first and then advance to the center of the island. In searching for duck nests in thickets and among boulders a long stick may be of help. A good clue is down from e.g. a Goosander nest deep under a rock. Duck nest left uncovered by the female must be covered with down or other nest material to protect the eggs from Hooded Crows.

Record the nests immediately when they have been found. The running number of the nest is written in waterproof ink on a nearby rock or a piece of wood to separate new or overlooked nests from those already found (do not write the nest number on the eggs). In large gull colonies where the nests are counted only once, a piece of grass may suffice to mark the nests. Remember that the parents should be allowed to return to their nests or young as soon as possible! If an island or a colony is too large to be surveyed during one visit, the count should be made on two or three days (only part of the island or part of the species is counted at one visit).

When counting nests one has to be careful not only in searching for them, but also in identifying them correctly. Identification is based on nest structure, eggs, down or nestlings. It is not possible to separate all the nests of the Common Tern from those of the Arctic Tern; in mixed colonies the pair numbers of the two species must often be estimated from the proportions of parent birds. All the nests in which eggs have been laid during the census year are recorded (see Sect. 8). – Note that in the archipelago it is easy to gather valuable data for Nest Record Cards (see instructions in Ch. 7 of this Manual)!

Waterfowl may be counted from a boat either in the same area where the islands are censused, or as a separate census in another area. The method is most suitable in archipelagos with large islands difficult to survey properly, and is the most suitable method for estimating the numbers of Velvet Scoter, Red-breasted Merganser and *Aythya* species. Drive a boat slowly along a pre-planned route which covers the area well, during calm weather, early in the morning or late in the evening when the birds are resting close to the shores. The best period is in late May or early June before the sexes separate. The birds are counted without putting

them to flight (avoid driving into bays or narrow straits). If necessary one may stop or land to take a look with binoculars or telescope. Write down the route, date, time, weather and observer, and locate the recorded birds (species, sex and number) on the census map. Some archipelago areas are censused most conveniently by walking along the shores of large islands and looking out from suitable observation points.

8. INTERPRETING OBSERVATIONS. The unit of the census is a pair, not an individual or a nest. The results are converted into pairs on the basis of nests found and adults and broods counted.

The number of observed adult birds is usually divided by two (odd numbers added with one: e.g. 5 Turnstones = 3 pairs). Especially in gulls and terns the pair numbers obtained in this way are usually too small, because some parent birds are away on feeding flights. A rough estimate for larid pair numbers is obtained by multiplying the number of adults by 0.7.

Non-breeding but local birds are counted as well (e.g. immature pairs of Mute Swan or Greylag Goose; part of Razorbills in a colony often do not nest, etc.). However, subadult, mottled gulls are not included in pair statistics. In *Anas* species a lone male, as well as a lone female, is interpreted as one pair (a group of 2–4 males = 2–4 pairs), in *Aythya* ducks (clear surplus of males) only the females are interpreted as pairs (see instructions for waterfowl censuses and Form 4A in Ch. 4a and 4b of this Manual). Clearly migrating birds are not counted in the pair numbers of the study area.

Pay special attention to the behaviour of the birds; e.g. a Redshank giving alarm-calls, an Arctic Skua showing injury-feigning, a White Wagtail carrying food, or a female duck alarming near the shore are reliable signs of nesting.

When searching for nests be careful not to mix nests of the previous year or uncompleted nests with the inhabited ones. In duck nests fresh down, brightly coloured eggshells and light and soft (not darkened and hard) shell membranes easily separate the empty nests of the current season from those of the previous year. In gull nests, young always leave some droppings; uncompleted nests are usually low constructions. Proper marking of nests is important in order to find out which of them have

already been counted during the last visit and which are new. The stage of breeding of a nest found at the second visit (number of eggs, amount of down, hatching of the chicks etc.) often indicates whether it is a first or a replacement clutch. The latter are not recorded as new nests in Form 5D, if part of the previously found nests have been destroyed. A waterfowl brood is included in the pair numbers of the nearest island, if it has probably not been included before on the basis of the parents or the nest, and if there is no reason to assume that the brood has immigrated to the study area from outside.

The final pair number of each island is obtained by combining the pair and nest data. In uncertain cases the data may be left to be interpreted in the Museum.

9. FILLING IN THE FORMS. The results of each visit to an island are reported on Island Form 5B and Visit Form 5D. The annual summary of these forms is presented in Summary Form 5A. Results of a waterfowl census by boat are reported on a separate Form 5D (the data are transferred into Form 5A; see the instructions from page 5C). After the first study year, send a copy of a map where the census area, the islands and their running numbers have been marked (possible A and B categories of islands separated).

10. REPEATING THE CENSUS. The census should be repeated in the same areas and islands during as many years as possible (minimum two years). To ensure comparability of the results the census has to be made in the same way every year:

- the same islands are censused
- the same observer(s)
- the same census routine

- good weather
- the same census period in relation to timing of the breeding each year (in practice the time difference in the respective census visits between early and late years is about 10 days).

If the routine of the census was changed, this should be mentioned in Form 5D!

11. SPECIAL CENSUSES. Arctic Skua, Lesser Black-backed Gull, Caspian Tern and auks are under special survey all over the Finnish archipelagos. Bird ringers and other active observers, try to monitor all nesting areas with special care! Additional information is available from the Museum.

Return the archipelago birds census forms to the Museum before the end of August!

REFERENCES

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- Hario, M., Kastepöld, T., Kilpi, M., Staav, R. & Stjernberg, T. 1987: Status of Caspian Terns *Sterna caspia* in the Baltic. - *Ornis Fennica* 64:154-157.
- Hildén, O. 1987: A new seabird monitoring scheme in Finland (in Finnish with English summary). - *Lintumies* 22:62-67.
- Kilpi, M. 1985: Archipelago bird populations in Finland: monitoring and recent changes. - *Ornis Fennica* 62:42-46.
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ARCHIPELAGO BIRD CENSUSES / ISLAND FORM

5B

Version II/1990

Cross if the island is new

Archipelago bird censuses/
Zoological Museum
P. Rautatiekatu 13
SF-00100 Helsinki

Return before the
end of August!

AREA NUMBER	ISLAND NUMBER	YEAR	PREVIOUS CENSUS YEAR	MUNICIPALITY (6 letter code)	OBSERVER NUMBER
1,3	1,3,0,4	1990	1989	K,U,S,T,A,V	1,2,3,4

NAME OF THE ISLAND (from map or sea chart)

R,I,U,T,T,A

Name: _____

Addr.: _____

Tel.: _____

CHANGES IN THE ISLAND DESCRIPTION

- 1 = Data presented for the first time
 2 = No changes (data not repeated here)
 3 = Changes from the last year

NATIONAL GRID COORDINATES S - N	W - E	EXPOSURE (do not fill in)	STAND OF FOREST	WAS THE WHOLE ISLAND CENSUSED		
6,7,4,3,2	1,7,4,5		<input checked="" type="checkbox"/> 1 = No trees 2 = Few trees 3 = Many trees	<input checked="" type="checkbox"/> 1 = Yes 2 = Not the wooded center		
LENGTH m	WIDTH m	HEIGHT 0.1 m	LAND AREA 0.01 ha	NUMBER OF BUILDINGS	NUMBER OF PERMANENT POOLS	NUMBER OF SHELTERED COVES
2,3,0	8,0	1,0,0	1,9,0	0	0	0

DISTRIBUTION OF THE TOTAL AREA (%)						
Open rock	Stony soil	Meadow	Mire patch	Juniper scrub	Conifer forest	Other
4,0	3			4,8		
Boulders	Sandy soil or gravel	Heath or stony meadow	Reed-bed	Deciduous scrub	Deciduous wood	What:
1	1	6		1		

DISTRIBUTION OF THE SHORELINE (%)						
Rock	Stony soil	Gravel or sandy soil	Shore meadow	Reed-bed	Narrow wooded shore	Other (what):
8,6	1,2	2				

<p>PRESENCE OF MAN (circle one code):</p> <p>1 = Not estimated 2 = Landing forbidden ③ = No restrictions, no settlement 4 = Inhabited island 5 = Recreational area</p>	<p>DISTURBANCES (report all mischief) (circle one code):</p> <p>1 = Not estimated ② = No disturbance 3 = Disturbance possible 4 = Definite disturbance 5 = Nests destroyed</p>	<p>MAMMALIAN PREDATOR(S) (circle one code):</p> <p>1 = Not estimated 2 = None present 3 = Present ④ = Present, species: FOX</p>
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(Reserved for special studies)

A	B	C	D	E

ADDITIONAL SPECIES PAIRS	ADDITIONAL SPECIES PAIRS
1 G.A.V.A.R.C	

5C HOW TO FILL IN THE ARCHIPELAGO BIRD CENSUS FORMS

The forms are filled in with clear handwriting, in pencil using BLOCK LETTERS. Numbers end at the right margin (e.g. length of an island, number of buildings). Alphabetic data start from the left margin (e.g. municipality, name of an island).

The annual summary is reported on Summary Form 5A, basic data from each island on Island Form 5B and results of each visit on Visit Form 5D.

SUMMARY FORM 5A

The total number of pairs on each island or of each boat count is reported here. Data are transferred from Visit Form 5D. Beside the name of the species the total pair number of the whole census area is summed up (in the lower margin there is room for the additional species of Form 5B).

ISLAND FORM 5B

The upper part is filled in each census year. The AREA NUMBER and ISLAND NUMBER for a new island are given at the Museum, later one may write these oneself and also give the YEAR OF THE LAST CENSUS. The MUNICIPALITY is abbreviated according to Appendix 2 in the Manual. An OBSERVER NUMBER is given to new observers by the Zoological Museum (see the general instructions in the Manual). The ISLAND NAME may consist of 18 letters or less. If the island has no name on the map, distance from the closest island with a name is reported: e.g. "SURTSEY 300 m NW".

The island is described in the middle of the form (framed with black) in the first year; only changes are reported later (if there are no changes, option 2 in the CHANGES IN THE ISLAND DATA is selected). This data may be gathered separately after the busy census period. NATIONAL GRID is given with an accuracy of 100x100 m (see the general instructions in the Manual; the last coordinate number stands for the 100x100 m square). In all questionable cases (problems in defining the coordinates) a scheme of the island and its surroundings is drawn behind Form 5D. The EXPOSURE is estimated at the Museum according to shelter given by neighbouring islands to the particular island. It is essential to know the exact location of the island when defining the degree of shelter. FORESTATION: Use code 2 even if there is only one tree for a Hooded Crow to sit in. WAS THE WHOLE ISLAND CENSUSED? Usually the answer will be yes (code 1), code 2 tells that the wooded center was not counted. The LENGTH and WIDTH of the island are estimated by imagining the island to be roughly rectangular; the question is not about the maximum length and width but the average size of the island. One should note that on the low islands of the Gulf of Bothnia flat shore areas without vegetation, unfit for nesting, are left out from the dimensions. The LAND AREA is estimated with an accuracy of 10x10 m from a map or from the approximated rectangular. HEIGHT is estimated with an accuracy of 0.1 m from the average water level to the top of the island, where possible big boulders are left out from the height. Such an accuracy is meaningful on low islands (e.g. 1.3 m is coded 13); on high islands, however, a rough estimate is sufficient (e.g. 4 m is coded 40). PERMANENT POOLS and SHELTERED CAVES: Only waters important as a feeding site or as a shelter for waterfowl broods are counted.

DISTRIBUTION OF THE TOTAL AREA. When reporting the proportions of the 13 habitats one should check that the sum is 100% (estimating is easier if a scheme of the island is drawn behind Form 5D). Boulders mean sites suitable for nesting of Black Guillemots. One per cent of the total area is given to a habitat which is important to birds even though its true area may

DISTRIBUTION OF THE SHORELINE. One should check that the sum of different habitats at the shoreline is 100%. A narrow wooded shore means a habitat too forested for seabirds to nest.

PRESENCE OF MAN. Option 2 means a preserved or a military area. Option 3 is used for a "normal" island without buildings. **DISTURBANCES.** Option 4 suits an island where people by camping often disturb the nesting of birds. Option 5 tells that e.g. gull nests have been destroyed on the island. **MAMMALIAN PREDATOR(S).** The species is reported, e.g., as follows: mink (faecies), mink/raccoon, fox?, etc.

Boxes A-E are reserved for additional information in special studies; of their use one may consult the Museum.

VISIT FORM 5D

There is room for four visits; if there are more visits, continue on another Form 5D (three visits is usually enough). **DURATION:** If more than one person is counting birds, the census time of all observers is summed. **SURVEY ACTIVITY** is used to show the species that were studied during the visit; codes are explained at the end of Form 5D. (One should not, however, give a survey activity code for species which were not estimated at that visit, or to species which do not breed on the island). The code X is used when the species nests on the island but has not been counted (in this case nothing else about the species is reported), or if only a part of the island was counted or if the visit was a superficial "drop by" (then the number of observed birds is reported). **ADULTS** mean the parents nesting on the island. These are reported from each visit unless some other survey activity code than D is used.

NESTS and BROODS. During the visit when survey activity category D or E is used for the first time for a species, its nest and brood numbers are counted. All nests with eggs or young, and nests used during this season (e.g. a deserted or destroyed empty nest) are marked. Only separate broods which were clearly seen outside nests are counted as broods. The groups of young in gull colonies are not divided into broods, but are reported in remarks (and taken into account when estimating the number of pairs). During the following visits only the nests and broods found for the first time are reported (one cannot avoid that some of the broods may be from nests reported already). The **PAIR NUMBER** is based mostly on the data of the visit most suitable for the particular species (the interpretation is checked at the Museum).

ORDINARY SPECIES: Thirty five ordinary archipelago species are listed in Form 5D. **ADDITIONAL SPECIES:** All other species are marked in Form 5B as additional species (if there is not enough space, one can continue in remarks). If there are more than 999 pairs of an ordinary species, "extra pairs" are reported in the box for additional species. The 3+3-letter codes of the species are available in Appendix 1 in the Manual. Observations on which the numbers of the pairs are based are marked after the estimated pair number of additional species. Numbers I-IV are used for the symbols of visits. For example, a line telling about the nesting of a pair of Slavonian Grebes could be the following: "1 PODAUR I: pair, II: nest with eggs". Additional passerines are also reported on Form 5B; e.g. two pairs of Chaffinches "2 FRICOE II: 2 singing".

ARCHIPELAGO BIRD CENSUSES / VISIT FORM

5D Area number: 13 Island number: 4 Observer(s): _____

YEAR	NUMBER OF VISITS	FIRST VISIT			SECOND VISIT			THIRD VISIT			FOURTH VISIT			
		Day	Mth.	hour (minutes)	Day	Mth.	hour (minutes)	Day	Mth.	hour (minutes)	Day	Mth.	hour (minutes)	
19	<u>90</u>	<u>4</u>	<u>75</u>	<u>1.1</u>	<u>2.0</u>	<u>265</u>	<u>1.2</u>	<u>6.0</u>	<u>296</u>	<u>1.0</u>	<u>5.0</u>	<u>167</u>	<u>1.1</u>	<u>2.0</u>

PAIRS	Species	Survey				Survey				Survey				Survey			
		act.	Adults	Nests	Broods	act.	Adults	Nests	Broods	act.	Adults	Nests	Broods	act.	Adults	Nests	Brds.
	Great Crested Grebe																
	Mute Swan																
<u>1</u>	Greylag Goose	<u>D</u>		<u>1</u>													
	Wigeon																
<u>1</u>	Mallard					<u>C</u>	<u>2</u>						<u>C</u>	<u>2</u>			
	Pintail																
	Shoveler																
<u>1</u>	Tufted Duck					<u>C</u>	<u>3</u>										
	Scaup																
<u>3</u>	Eider					<u>C</u>	<u>2</u>			<u>D</u>		<u>2</u>	<u>1</u>				
<u>1</u>	Velvet Scoter									<u>C</u>	<u>2</u>						
	Goldeneye																
<u>4</u>	Red-br. Merganser					<u>D</u>	<u>4</u>										
<u>1</u>	Goosander					<u>D</u>	<u>1</u>										
	Oystercatcher																
	Ringed Plover																
<u>1</u>	Redshank					<u>C</u>	<u>2</u>										
	Common Sandpiper																
<u>5</u>	Turnstone					<u>C</u>	<u>3</u>			<u>C</u>	<u>9</u>						
<u>1</u>	Arctic Skua					<u>C</u>	<u>2</u>										
	Black-headed Gull																
<u>12</u>	Common Gull					<u>C</u>	<u>7</u>			<u>C</u>	<u>18</u>						
<u>20</u>	Lesser Black-b. Gull					<u>C</u>	<u>19</u>			<u>C</u>	<u>28</u>						
<u>30</u>	Herring Gull					<u>C</u>	<u>43</u>										
<u>3</u>	Great Black-b. Gull					<u>C</u>	<u>6</u>										
	Caspian Tern																
<u>1</u>	Common Tern									<u>D</u>		<u>1</u>					
<u>32</u>	Arctic Tern									<u>C</u>	<u>46</u>	<u>2</u>					
	Tern spp.																
	Razorbill																
<u>26</u>	Black Guillemot					<u>C</u>	<u>34</u>			<u>C</u>	<u>52</u>						
	Meadow Pipit																
<u>2</u>	Rock Pipit					<u>C</u>	<u>3</u>										
	White Wagtail																
	Wheatear																
<u>1</u>	Hooded Crow	<u>D</u>		<u>1</u>													

CODES OF SURVEY ACTIVITY: A = the island observed from a nearby island or passed; B = the island was inspected with a boat by slowly driving along the shores; C = the island was landed on and adults were counted; D = nests and broods were counted; E = adults, nests and broods were counted; X = the census was somehow incomplete (closer report in "remarks").

REMARKS: BLACK-THROATED DIVER: 2ND VISIT D1

