On the study of waterfowl in Estonia

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The planned study of waterfowl in Estonia was started in the early 1950s with censuses on inland bodies of water and with research on the ecology of grebes *(Podiceps).* Extensive observations on autumnal migration were carried out from 1954 to 1962. Since 1957, waterfowl have been censused and their breeding and population ecology has been investigated on the Matsalu State Nature Reserve, and since 1959 also on the Vilsandi (Vaika) State Nature Reserve. In 1961—1969, breeding birds were counted on most of the islands of west Estonia and in 1971—1975 on the islands lying in the southern part of the Gulf of Finland. Since 1967 counts have been made of wintering waterfowl, since 1968 observations on the moult migration of the Common Scoter *(Melanitta nigra),* and since 1973 censuses by aeroplane of waterfowl have been made during the spring migration. Research is in progress on the breeding and population ecology of several bird species.

Because of the large number of habitats favourable for waterfowl, these birds constitute a large proportion of the bird fauna of Estonia. Thirty-seven species of Anseriformes may be met with (19 breeding species, 10 species in large numbers on transit); in addition there are 3 species of divers *(Gavia),* 2 of them breeding, 5 species of grebes *(Podiceps),* 4 breeding, and 2 species of Rallidae. In spring and in autumn millions of waterfowl pass over Estonia; in winter up to 30 000 waterfowl have been counted on the ice-free sea and on the inland bodies of water.

Owing to their abundance in Estonia, waterfowl have been studied in connection with nearly all ornithological investigations involving sizeable areas. Our classical areas for research on the bird fauna have been habitats connected with bodies of water, such as Matsalu Bay and its vicinity, the islands of the area round Vilsandi, several lakes, etc.

At present, waterfowl research is conducted at the Institute of Zoology and Botany of the Academy of Sciences of the Estonian S.S.R. The chief areas of the study are the Matsalu and Vilsandi State Nature Reserves, with a few smaller areas. Amateur ornithologists of the Estonian Naturalists' Society have gladly joined in the field work.

The investigation of waterfowl has proceeded along several different lines.

(1) *The study of distribution and numbers.* The planned study of distribution and numbers of waterfowl during the breeding period was started in 1950 by S. ONNO. The data that accumulated on the distribution of birds during the breeding season on the inland bodies of water in Estonia led to a new classification of these waterbodies.

Annual censuses of breeding waterfowl have been carried out on the Matsalu State Nature Reserve since 1957

and since 1959 on the Vilsandi (Vaika) State Nature Reserve. Under the direction of S. ONNO, breeding waterfowl were counted on most of the islands of west Estonia. In 1971—1975 O. RENNO organized a similar census in the southern part of the Gulf of Finland. These investigations served as a basis for estimates of the total numbers of waterfowl on the territory of Estonia.

A broad study of the distribution and numbers of waterfowl during migration in Estonia was started in 1953 under the guidance of E. KUMARI. Extensive observations were conducted in 1954—1962 at 38 observation points set up all over Estonia. As a result, details of the autumn migration of waterfowl, particularly diving ducks, are by now fairly well known. Observations and censuses have been carried out on the migration of individual species. With the help of amateur ornithologists, information has been collected since 1964 on geese and brents in transit.

Censuses by aeroplane of Anseriformes during the spring migration were started in 1973. In 1968, 1971, 1973 and 1975 observations on the moult migration of the Common Scoter *(Melanitta nigra)* were carried out at observation points set up in north and north-west Estonia.

Since 1968 censuses of waterfowl wintering in Estonia have been taken annually.

(2) *The study of breeding ecology.* An extensive ecological study of waterfowl in Estonia was started in the 1950s. It was also initiated by S. ONNO. Until 1957, ONNO collected a large body of data on the ecology of grebes *(Podiceps)*. In 1957, he initiated a study of the breeding ecology of waterfowl in Matsalu Bay according to a unified research programme. In addition, data on breeding ecology have been continuously collected at the Vilsandi Nature Reserve. Studies of the more numerous species have thrown light on special problems of breeding ecology (clutch size, nesting time, etc.). The autecology of the Grey Lag Goose *(Anser anser)*, Eider *(Somateria mollissima)*, Tufted Duck *(Aythya fuligula)* and Velvet Scoter *(Melanitta fusca)* has been studied in detail.

(3) *The study of population ecology.* Research concerning the distribution, numbers and breeding ecology of birds is closely related to the study of population ecology. Population ecological studies were initiated at the Institute of Zoology and Botany by S. ONNO. The chief aim was to establish the structure of the populations of the species under study (composition according to age, site-tenacity, etc.). Large-scale ringing of young and adult birds and their recapture on the nest was found suitable for both gull and waterfowl species. At the present time adult waterfowl and their young are captured and ringed in large numbers on both the Matsalu and Vaika Nature Reserves.

(4) *Protection of waterfowl and research on game management.* The protection of waterfowl in Estonia is chiefly based on the Nature Conservation Law and on the national and local nature reserves. Of the waterfowl, the following are protected: *Alca torda, Cepphus grylle, Gavia, Podiceps* except for *P. cristatus, Cygnus, Branta leucopsis, B. bernicla, Anser anser, Tadorna tadorna* and *Somateria mollissima.* Ornithologists made the proposal to enter the rare and endangered species of *Branta leucopsis, B. bernicla* and *Anser erythropus* on red data sheets and the rare species *Anser anser, Cygnus cygnus, C. bewickii, Tadorna tadorna* and *Anas strepera* on white data sheets in the Estonian Red Data Book. The results of the study of waterfowl

have been and are being taken into account in the planning of new nature reserves, in the working out of the protection regime, and in the introduction of amendments to the protection regime on these nature reserves. At the insistence of ornithologists the shooting of brents *(Branta)* has been prohibited since 1968 and the spring shooting of geese *(Anser)* since 1969.

On the recommendation of ornithologists in 1968, the numbers of waterfowl shot are now counted, with the aim of further controlling the shooting. Counts are based on questionnaires, and shooting permits as well as on the collected wings of the ducks shot.

The results show that in 1973, for instance, 22 000 waterfowl were shot in Estonia (with the total number of hunters circa 16 000). The composition of the bags proved to be 90 % dabbling ducks, chiefly Mallards *(Anas platyrhynchos)* and 10 % diving ducks. The conclusions to be drawn is that shooting of diving ducks should be encouraged so as to prevent excessive shooting of dabbling ducks.

Selostus: Vesilintujen tutkimuksesta Virossa

Eri vesilintujen levinneisyyttä ja lukumääriä ryhdyttiin järjestelmällisesti tutkimaan Virossa v. 1950 (S. Onno), ja nykyisin eri lajien Virossa pesivän kannan suuruus voidaan varsin luotettavasti arvioida. Vesilintujen muuttoa on selvitetty vuodesta 1953 (E. Kumari); havaintoja koottiin syksyinä 1954—1962 eri puolilla Viroa olleissa 38 pisteessä. Kevätmuutolla olevia sorsalintuja on laskettu lentokoneesta vuodesta 1973. Talvehtivia vesilintuja on laskettu vuosittain vuodesta 1968; merellä ja sisävesissä talvehtii jopa 30 000 yksilöä. Perusteellisimpien pesimäekologisten selvitysten kohteena ovat olleet uikut, merihanhi, haahka, tukkasotka ja pilkkasiipi.

Seuraavia lajeja suojellaan Virossa: ruokki, riskilä, *Gavia*t, uikut silkkiuikkua lukuun ottamatta, joutsenet, valkoposki-, sepel- ja merihanhi, ristisorsa sekä haahka. Vesilintututkimuksien tuloksia käytetään hyväksi suojelualueiden suunnittelussa. Vuonna 1973 Viron metsästäjät (16 000) ampuivat 22 000 vesilintua, joista 90 % puolisukeltajia (etenkin sinisorsia) ja vain 10 % sukeltajasorsia.