

# **The Wildfowl in the Matsalu National Park**

**Erik Kumari**

THE Matsalu National Park is situated at the mouth of the R. Kasari on the west coast of Estonia, facing the Baltic Sea. For nearly a hundred years Matsalu Bay, with its rich population of marsh and sea birds, has attracted the attention of ornithologists, both native and foreign; and, indeed, this vast, sheltered expanse of shallow water, only faintly brackish, constitutes a unique breeding ground for waterfowl, which is not confined to the bay itself but extends along the surrounding flats and shallows, and embraces part of the island-dotted straits known as the "Väinameri" or "Muhu Väin" (Muhu Sound). Nearly all the local breeding birds of the East Baltic area are represented here, while legions of northern migrants break their flight at Matsalu in the spring and autumn.

Today we may speak of an established tradition of ornithological study, forged in the course of long years of observation and experiment. When the present national park, covering 60,000 hectares (about 232 square miles), came into being in 1957, it was already backed by nearly a century of scientific research and a large number of interesting investigations into various problems of faunistics and ecology.

Matsalu is not only the largest nature reserve in the Baltic area. With its dense bird population and great variety of species, it may be regarded as possessing far more than a mere local importance. For this reason it was felt that a brief survey of the wildfowl reserves of the Park might be of interest to readers of the present Annual Report. Before embarking upon his subject, however, the author feels it incumbent upon him to acknowledge his indebtedness to Mr. Hugh Boyd, to whose initiative the present article owes its existence and without whose encouragement it would never have been penned.

## **A history of research in the Park**

The bird haven at Matsalu Bay, often called the Matsalu "bird paradise," was first discovered by Valerian Russow, curator of the Museum of Zoology of Tartu University, in 1870. Russow returned to the site in several succeeding summers and published a series of articles containing the results of his investigations in various publications of the Tartu Naturalists' Society. At the end of the 19th and beginning of the 20th century, research expeditions were conducted here by two prominent Baltic ornithologists — E. von Middendorff, whose collections are at present preserved in the Leningrad Museum of Zoology, now controlled by the Academy of Sciences of the U.S.S.R., and F. E. Stoll, whose materials have been incorporated in the stocks of the Natural Sciences Museum at Riga.

From the first decade of the present century the investigations at Matsalu acquired especial impetus. In the spring of 1907 the bay was visited by S. A. Buturlin and Baron Loudon, while the latter returned to the spot in the spring of 1909. These investigations produced two more articles, which duly appeared in German ornithological magazines. In the summer of 1924 the Tartu University Museum of Zoology organised a new expedition, one of the members of which produced an extensive article on the bird population of the bay (M. Härms, 1926). Round about the same time R. F. Meiklejohn, of the British Consulate at Tallinn, paid a number of visits to Matsalu with the

object of collecting oological materials, and published his findings in another article, printed in the same year. From 1900 to 1925 a large number of other ornithologists, amateurs and collectors investigated the bird population of the bay, contributing numerous reports and articles to the press and gathering materials which are now preserved in various private collections and local museums.

Research work on a broad scale may be said to have begun in 1928, when the author of the present article made his first trips to the neighbourhood of the bay. His studies of the local bird population were continued till 1936 (incl.) and yielded materials for a comprehensive survey which was printed in the following year (Kumari, 1937). A number of local investigators also visited the bay for purposes of research during the years immediately preceding and following the second World War.

In 1953 the Puhtu Bird Station, which belongs to the Institute of Zoology and Botany of the Academy of Sciences, was set up in the immediate vicinity of the bay. All pre-conditions for the further development of ornithological research were now fulfilled, and results were soon forthcoming. Members of the Institute began to pay regular visits to the bay and soon, on the basis of the draft projects they submitted, the Matsalu National Park was set up, equipped with its own custodians, managing staff and scientific personnel. From the moment of its formation the reserve became a permanent theatre for field operations by specialists of the Institute, who pursue their researches here every summer, working in close collaboration with the local staff. Special mention should be made of the studies of waterfowl carried out over the past five years by Sven Onno, of the Institute. Another investigator, Valdur Paakspuu, employed on the staff of the reserve, has chosen the ecology of the Greylag Goose as the subject of his degree thesis. Onno has also published a preliminary review of the latest developmnts in local research (1958), while further papers are nearing completion.

Such is, in bare outline, the history of the Matsalu National Park, particularly with regard to the study of the local ornithofauna.

#### **Description of the National Park**

Matsalu Bay is protracted in a westerly direction, with a maximum length of 21 kms, while the greatest breadth of the shallow inner bay is 6.8 kms from north to south. In the eastern reaches of the bay the water is not more than about one metre deep, while that of the western part, farther out to sea, rarely exceeds 4 metres. To the eastern section are attached the water-meadows and delta of the R. Kasari, stretching 13.5 kms from east to west, and 4.5 kms from north to south. The delta and the inner stretches of the bay itself are overgrown with huge beds of tall reeds several sq.kms. in extent, the largest of their kind in the Baltic area. It is these reed-beds which form one of the most characteristic wildfowl habitats in the reserve. Another typical habitat is provided by the extensive water-logged hayfields lining the coast, where the whole of the grass is mown down in the summer for fodder. Yet a third basic habitat-type may be distinguished in the broad pasture lands running down to the sea, where large herds of cattle are turned out to graze every summer. While the hayfields and water-meadows are covered with tall grasses, the turf of the pastures is sparse and the surface trampled hard underfoot, with the result that well-defined differences may be discerned in the species groups represented.

Matsalu Bay is dotted with tiny islets, for the most part overgrown with grass and encircled with belts of reeds. There are also large numbers of islands in the seaward part of the reserve, scattered over the Sound. Some of these are overgrown with grass and junipers, but others are barren and stony, almost, if not quite, denuded of vegetation. Most of these outlying islands are frequented by maritime species which prefer to keep aloof from the coast and rarely venture into the inner parts of the bay.

There are few woods in the park, as oversaturation of the soil does not permit the growth of bushes and trees. Isolated copses and thin strips of woodland are to be found only on the crests of the humps and along the steep banks of the rivers. On the other hand there are fine deciduous forests sprinkled with oaks and other valuable industrial species in the outlying parts of the reserve.

In addition to the natural advantages derived from its geographical position and from distinctive features of the landscape, the site possesses plentiful reserves of food. Both bay and river are well stocked with fish, and large quantities of invertebrates are to be found not only in the water but also in the surrounding hayfields and pastures.

From the latest investigations the open expanses of the reserve are known to be inhabited by 75 nesting species, to which should be added 13 other local breeders which haunt the thickets fringing the river banks. Between 1928 and 1935 the main channels of the Kasari, as also of the other streams flowing into the bay, were dredged and deepened. Within a short space of time the mud banks thrown up on each side of the river were overgrown with trees and shrubs. This in its turn has greatly contributed to the drainage of the water-meadows, and clumps of stunted willows may be seen scattered here and there in districts where thirty or forty years ago no tree could grow on account of the extreme humidity of the soil. At the same time those habitats which were formerly confined to the delta and the inner section of the bay have during the past thirty years tended to invade the central and outer zones of the reserve, carrying with them their own specific bird populations. As a result the avifauna of the delta has spread slowly but surely in a westerly direction. Thus the locality affords exceptional opportunities for studying the changes that are gradually taking place in the lives of the waterfowl, partly as a result of natural factors, and partly of human activity.

#### **The Anatidae of Matsalu**

At the present time the reserve is inhabited by 29 species of waterfowl, of which 16 are local breeders, 22 migrants (including those species of which the southernmost colonies nest in Estonia, while the remainder move farther on to the north), and 2 errant species (the Mute Swan and Red-crested Pochard). We shall now briefly discuss each species in turn, before going on to mention one or two general ornithological problems concerning the waterfowl population as a whole.

**Whooper Swan** *Cygnus cygnus*. An extremely common migrant from March to May (the peak falling in April), and to a somewhat lesser extent in October and November. During the spring transit thousands of individuals alight on the Bay (especially in the central parts), and flock here for several weeks feeding and resting. The species shows a marked preference for certain shallows, rich in nutrients. As many as 40,000-50,000 Whooper-Swans may halt at Matsalu in one day, while the larger parties are several hundreds

strong. In all, many hundreds of thousands pass in the spring. The autumn flight is much feebler and the halts of shorter duration.

Matsalu Bay has been for centuries the most popular hunting ground for swans in the Baltic, and hundreds of these birds used to be shot down every year. Now, with the implementation of the new protection regulations which forbid the hunting of swans throughout Estonia all the year round, the importance of the Bay as a halting-place during migration has steadily grown, and the reserve can claim with little fear of dispute to be regarded as one of the chief swan reservations in the whole of Northern Europe.

**Bewick's Swan** *Cygnus columbianus bewickii*. All the above remarks concerning halting-places and times of transit are also valid for Bewick's Swan, with the sole difference that it occurs in far lesser numbers than the Whooper. During their sojourn in the bay the flocks of both birds freely intermingle, but when flight is resumed the species usually separate off once again. On favourable days thousands of Bewick's Swan may be seen, and the total for the spring transit runs into tens of thousands.

**Mute Swan** *Cygnus olor*. From 1928 this species had ceased to breed in Estonia, where it was no longer to be found in a wild state. It returned, however, in 1959, and in 1961 nests were traced at a number of points on the west coast and in the adjoining archipelago, while a few individuals have already been spotted in the Bay. There is every chance that these are "scouts," and that in the course of time the Mute Swan will settle down permanently in the bay, which should provide it with a breeding ground admirably suited to its habits and requirements.

**Greylag Goose** *Anser anser*. This is one of the most valuable breeding birds in the reserve, where it keeps mainly to the bay, though it also occurs to a somewhat lesser extent on the islands in the Sound. Indeed it was one of the reasons why the bay itself was placed under protection. At the present time about 200 pairs nest on the territory of the park, roughly the same number as used to nest in the inner reaches of the bay alone about thirty years ago. During the last hundred years the numbers of Greylags at Matsalu have sharply fallen, most probably as a result of the intensive hunting of former times, and partly also of the indiscriminate plundering of the nests. At any rate there seem to be no grounds for assuming that natural causes, such as changes in the landscape, are to blame.

The Greylag arrives in March and nests mostly in the reed beds, occasionally even in quite small clumps of reeds, thus earning its popular nickname: "roohani" ("reed goose"). The first eggs may be deposited in the nest about the middle of April, and the young are mostly hatched between the 15th and 20th of May. After all the young are hatched the majority of the birds nesting in the inner reaches of the bay move out into the Muhu Sound. Here, in the vicinity of the islands and sandbanks, where the sea is shallower, the fledglings grow up and the old birds moult. Ringing and marking have been begun, and up to the present about 40 individuals (all of them pulli) have been fitted with wing marks. One of these (marked on 15th May, 1959) was traced on 9th October of the same year on the Neusiedlersee, Austria.

The Greylag is of minor significance as a migrant, since the extreme northern limits of its range are not far distant from its breeding haunts at Matsalu.

**White-fronted Goose** *Anser albifrons*. An ordinary visitor in both migratory seasons. Occasionally alights in the open hayfields and the water-

meadows of the Kasari. The spring-transit takes place in April and May; the autumn passage in September and October. The migratory parties usually comprise a few dozen birds, larger flocks (up to 300) occurring somewhat rarely, though as many as 2000 individuals have been known to assemble at suitable halting-places.

**Lesser White-fronted Goose** *Anser erythropus*. Migratory habits similar to above, but less numerous. The largest single count yielded about 2500.

**Bean Goose** *Anser fabalis*. A common and in some years even a mass migrant. April and May in the spring, September and October in the autumn (especially the end of September and beginning of October). At the turn of the century the Bean-Goose frequently alighted in the cultivated fields at the back of the bay. Now that these have been somewhat more densely built over, it prefers to break its flight in the pastures and hayfields along the shore. Although the species is a frequent visitor to the reserve during the migration period, it is by no means so numerous here as at certain points farther inland (the environs of Lake Peipsi and Lake Võrtsjärv).

**Brent Goose** *Branta bernicla*. Passes in small numbers down the Sound and seldom appears in the reserve.

**Barnacle Goose** *Branta leucopsis*. A common migrant in April and May, somewhat less prominent in September and October. Towards the end of April and during the first half of May thousands of individuals alight on the treeless shores on the outskirts of the bay (near Metsküla, Saastna and Puise), more rarely on the islands in the Sound. This species is hardly ever to be seen in the inner recesses of the bay, but is restricted by its feeding habits to the grassy mudflats, made slightly saline by periodic inundations, lining the outermost segments of the littoral.

**Shelduck** *Tadorna tadorna*. A rare local breeder, which nests here and there on the islands in the Sound.

**Mallard** *Anas platyrhynchos*. Common both as a breeder and as a migrant throughout the whole of the reserve, though relatively few winter on the spot, as the surface normally freezes over. During the last thirty years the numbers of this species as a breeding bird have considerably diminished, probably as a result of hunting in its migration and wintering haunts. As late as 1935-36 the Mallard still nested in thousands on the land round the bay. Huge congregations of males used to flock from the second half of May, when they gathered for the moulting season. Flocks of males numbering several thousands were by no means rare at the end of May or the beginning of June, and the total number in the bay might run into many hundreds of thousands. The present number of males mustering at Matsalu for the moulting season has been estimated by Onno at about 10,000 individuals.

**Teal** *Anas crecca*. Nests in small numbers on the inland parts of the reserve. Passes *en masse* in April, and again in September and October, the largest parties containing thousands of birds. Large numbers of males make their appearance in midsummer to moult.

**Garganey** *Anas querquedula*. Occurs chiefly in the inner reaches of the bay, as a common, though not particularly numerous, breeding species. The local birds moult in the bay, and there is no considerable influx from outside. Represented more or less sparsely even during the migration period.

**Gadwall** *Anas strepera*. Formerly known only as a stray visitor; but has produced a few isolated pairs almost every year during the last five years, and has even been shown to nest locally in exceptional cases.

**Wigeon** *Anas penelope*. Does not breed in the locality. Occurs as a mass migrant (thousands strong) in April and May, and again in September and October. A few mateless males remain to moult in the bay, where they spend the whole of the summer.

**Pintail** *Anas acuta*. A rare local breeder, the numbers of which are slowly but steadily increasing (about 15 pairs in 1935-36; now about 45 pairs). Present in abundance during the spring and autumn flights, when thousands of individuals alight at suitable spots, but on the whole less numerous than the Teal, which passes at much the same time and halts in much the same places.

**Shoveler** *Spatula clypeata*. One of those waterfowl which have shown a consistent upward trend over the last thirty years. In 1935-36 at least 55 breeding pairs settled in the inner part of the bay (figures for the outer zone were incomplete). In 1940 and 1941 an invasion-type immigration of the Shoveler, which made itself felt over the whole territory of Estonia, left its mark also on Matsalu Bay. At the present time, according to data gathered by Onno, at least 180 pairs nest in the park. Both transit and moult migrations are relatively inconspicuous.

**Red-crested Pochard** *Netta rufina*. A stray visitor, recorded on only one occasion.

**Pochard** *Aythya ferina*. Has sharply decreased as a breeder in Matsalu Bay, during the past thirty years. In 1935 and 1936 at least 225 pairs nested in the inner parts of the bay, while a strong influx of moulting males took place in the summer (June and July). Now the number of Pochard in the reserve has dropped to 150 pairs, and the parties of moulting males do not, in Onno's opinion, exceed 100 individuals. Frequency of occurrence rises abruptly during passage in April, when the males far outnumber their companions.

**Tufted Duck** *Aythya fuligula*. A common breeder and mass migrant (in April and May, and again in September and October). During the past thirty years the numbers of birds nesting in the interior have fallen from 100 to about 75 pairs. At the same time drainage of the inmost recesses of the bay following dredging of the river has given rise to an outward drive, and the species has begun to settle more densely in the islands of the central and outer zones. A common moulter at Matsalu, probably immigrating from the outside.

**Scaup** *Aythya marila*. One of the most prominent migrants, passing in tens of thousands along the outer verge of the bay and down the Muhu Sound in April and May, and returning between September and November. Rarely breeds in the reserve, only a few isolated pairs having been recorded in recent years (Onno, 1959).

**Goldeneye** *Bucephala clangula*. Also appears in hosts during migration season, skirting the outer bay and advancing along the Sound in tens of thousands in October and November, and again from the breaking of the ice till the end of April, the numbers falling off in May. In the middle of the summer huge flocks of males gather to moult in the neighbourhood of some of the islands in the Sound. Has been known on occasion to occupy the nest-boxes set up for the Goosander (Onno, 1959).

**Long-tailed Duck** *Clangula hyemalis*. Passes in hundreds of thousands along the Sound and the outlying parts of the bay in April and May, and again in October and November. The peak of the spring transit through the Sound usually falls during the second half of May, together with that of the

Common Scoter (Kumari, 1958). Occasional solitary birds may be met with on the sea all through the summer, and parties may also be found in the winter, when the bay is not ice-bound.

**Velvet Scoter** *Melanitta fusca*. A common breeder on the outskirts of the bay and all the islands of the Sound (over 100 pairs), and well to the fore as a migrant in both spring and autumn.

**Common Scoter** *Melanitta nigra*. General characteristics much the same as those of the Long-tailed Duck. A particularly impressive feature of the spring transit is the mass departure from the Muhu Sound during the second half of May, when tens of thousands of individuals take wing together to continue their flight to the North. Moulting males arrive on the spot already in the middle of the summer (the second half of July), the females and young not following till September or October, when the migration is also very brisk.

**Eider** *Somateria mollissima*. Represented in the reserve as a local breeder by almost 100 pairs scattered over the islands in the Sound. Occurs in small numbers during the migration season.

**Goosander** *Mergus merganser*. A familiar breeding species all over the reserve, where it nests freely in natural hollows (cavities under boulders, hollow trees etc.), as well as in artificial nests erected by human agency (such nest-boxes used to be widely used by the local inhabitants, who collected the eggs for food). The Goosander is also prominent during the migration period.

**Red-breasted Merganser** *Mergus serrator*. Breeds readily in the outer zone and on the islands in the Sound, but avoids the inner parts of the bay. A common migrant,

**Smew** *Mergus albellus*. Visits the park in both spring and autumn, but only in small quantities. During halts associates most readily with the Goldeneye.

Investigations carried out in recent years by Sven Onno point to marked divergencies in the species represented and in the numerical strength of certain species in different parts of the reserve. Thus the chief breeding birds on the islands in the Väinameri, the most seaward part of the reserve, are the Velvet Scoter, Eider and Shoveler; on the islands in the middle of the bay—the Tufted Duck, Mallard and Shoveler; and in the meadows and hayfields round the delta—the Mallard and Pintail.

If we compare the present population of the bay with that which existed from twenty-five to thirty years ago, we cannot fail to note the profound changes that have taken place both in the habitats themselves, and in the distribution and numbers of the species they shelter. These are partly due to changes that are gradually taking place in the natural environment, especially as a result of the dredging of the river. On the whole there is a general tendency for certain landscape types to shift slowly in a westerly direction, carrying with them the species groups with which they are associated.

Throughout the bay, and especially in the inner reaches, the numbers of Mallard, Pochard and Tufted Duck are steadily decreasing, while the last has wandered farther west and now nests in abundance round the islands in the centre of the bay and in the Väinameri. This latter tendency has undoubtedly been encouraged by the new protection regulations, introduced in 1957. Of recent years the Pintail, and especially the Shoveler, have consistently increased, though this can hardly be explained by the influence of local factors. Recently, too, isolated pairs of the Gadwall, Scaup and Goldeneye, all of which were formerly absent from the reserve, have begun to put in an

occasional appearance. The Shelduck threatens to drop out of the picture altogether, whereas, thanks to the protection regulations, the Eider appears to be increasing rather than diminishing.

A young Estonian ornithologist, Rein Saluri, has investigated the commencement of the breeding period in the park. The date when the first egg was laid was counted as the absolute beginning of the nesting season for each species, while the average beginning was fixed as the date by which 50 per cent of the clutches had been initiated. Gathering data on these lines from 1957 to 1960, the author was able to generalise from extensive materials, the species most poorly represented being the Pintail (37 clutches) and Red-breasted Merganser (48 clutches), while the most numerous species were the Tufted Duck and Velvet Scoter (with 411 and 244 clutches respectively).

In this way the average beginning of the nesting season for the waterfowl at Matsalu was determined as follows: the Pintail—May 11th, Mallard—May 14th, Shoveler—May 15th, Goosander—May 20th, Garganey—May 20th, Eider—May 21st, Pochard—May 29th, Tufted Duck—June 2nd, Red-breasted Merganser—June 14th, and Velvet Scoter—June 16th. The dates for the species at the ends of the list reveal a difference of more than five weeks.

Rein Saluri also finds that the breaking up of the sea-ice has some effect on the beginning of the season in such early-nesting species as the Eider and Goosander. At the same time differences can be observed between the breeding periods of the bird populations in the inner, central and outer parts of the bay (including the islands in the Sound), though these are less pronounced in the ducks than in the gulls and waders.

#### **Matsalu as an international asset**

In view of the remarkably favourable conditions obtaining in the reserve and the exceptional density of the bird population, not to speak of the importance of the site as a halting-place for northern waterfowl during migration, it has been proposed that the Matsalu National Park should receive the status of a permanent European Reserve (Europe-reservat). It seems to us that the imposing flocks of swans, the endless skeins of Long-tailed Ducks and Common Scoters, and the huge masses of other migrants which assemble here year after year during the spring and autumn transits are composed of more or less the same birds. If this is so, it follows that they remember the bay as a much-needed haven, where they are assured of shelter and protection now that hunting has been prohibited in the reserve. It is this that makes Matsalu a sanctuary of an importance transcending mere local bounds.

But the park is far more than the breeding ground of a rich population of waterfowl, including a number of rare nesting species. It is a unique open-air museum for wild bird life, of which the significance, both as a nature reserve and as a centre for scientific research, may be expected to last for many years.

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