

Experience in waterfowl management under the conditions prevailing in the Latvian S.S.R.

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Summary

Trials and observations in Latvia show that for the preservation of the resources of waterfowl and their nesting populations in densely populated localities a complex of the following preservation and biotechnical measures is needed:

1. Complete cessation of human economic activity and of the sojourn of humans during the spring and summer on areas of reservoirs suitable for nesting of birds, on grassy islands and peninsulas;
2. Adaptation of existing islands and peninsulas for intensive nesting of ducks; (a) by cutting trees and bushes growing on them; (b) by complete destruction of reeds on the inner part of islands; (c) by arranging wide passages to the open water in belts of dense growth around islands;
3. Construction of small artificial grassy islands;
4. Permanent maintenance of intensive nesting grounds, by control of overgrowing by trees, bushes and reeds, and by preventing the formation of compact reed banks and thickets of other plants in the accesses to the water;
5. Reduction to a minimum of the number of raptorial birds and beasts which destroy nests in the vicinity of large nesting grounds of waterfowl;
6. Establishment of zones in which hunting is banned, so as to offer shelter to the birds during the hunting season.

Introduction

The decline in the numbers of waterfowl of sporting interest in densely populated districts is a well-known fact. One of the measures applied with increasing frequency to protect waterfowl from excessive destruction are hunting restrictions. In the Latvian S.S.R. spring hunting of ducks is completely banned and the autumn season is opened later, shooting time is restricted to definite days and hours, norms of hunters' bags are established by regulations, so is the number of cartridges per hunter to reduce the number of crippled birds, and so on.

Hunting restrictions alone, however, are in our view not sufficient to avert the reduction of game waterfowl stocks. In densely populated districts the diminishing numbers of local (nesting) waterfowl populations are closely correlated with the general increase of population, intensification of economic activity, and the assimilation and transformation of new lands previously little utilized. As a result of general and ever-expanding human activity, birds lose more and more suitable living strongholds with an adequate habitat. Under such conditions the conservation of wild ducks may be practically supported only by a system of individual parcels or ranges assigned specially for this purpose in the form of permanent or seasonal conservancy zones or reserves. The latter should represent the most suitable areas for the indicated purpose, areas where restrictions of economic activity may be of maximum benefit for the preservation of birds, while entailing only a

minimum of prejudice to other branches of human activity.

Our team of ornithologists has been occupied during the last ten years with elaborating a system of management and biotechnical measures with a view to preserving and multiplying the nesting waterfowl populations on restricted areas adapted to conditions prevailing in Latvia. Experiments in waterfowl management were performed on a number of lakes, principally on the large (44 sq. km.), strongly overgrown, shallow littoral Lake Engure (situated on the western coast of the Gulf of Riga).

Major results of trials and observations

Rating surveys and censuses of birds have shown that the favourite nesting places of ducks on overgrown lakes are small open islands covered with grass-sedge vegetation. Ducks' nests are found considerably more frequently on such islands than in coastal meadows. Since some agricultural practices are normally being carried on on the islands, the majority of the nests usually fail. According to our observations the major danger for the birds derives from the grazing of cattle and especially of sheep. On the islands where early hay harvesting is performed in the first half or middle of June many nests are abandoned or, being deprived of their disguise or camouflage, are ravaged by birds of prey. Finally, a large number of ducks simply avoid settling on islands where hay mowing or cattle grazing is practised, because of the usual absence from such islands of sufficiently high old grass left in

the spring for the birds to conceal their nests. On places where the grass has been destroyed in autumn the highest density of duck nests was, according to our observations, only half that on adjacent sites where the grass of the preceding year had been left untouched. A very adverse effect on the numbers of ducks is also exerted by intense human activity (fishing, tourism) in the overgrown areas of natural reservoirs; not only does the loss of clutches of coots and ducks which nest in the reed banks and on sloughs (predominantly Pochard *Aythya ferina*) increase substantially, but many broods also perish. Our experience on Lake Engure (and subsequently also on other reservoirs) confirms that the complete cessation of human economic activity on small areas suitable for the nesting of ducks represents an extremely efficacious measure for the protection and preservation of these birds under the prevailing conditions. Since 1957 economic activity has been banned on several islands in the lake, and a conservancy zone was established covering a large part of its water surface on which any economic or sports activity has

to cease and human visits are restricted every year from March to the end of July. At the same time control of birds of prey (predominantly Marsh Harrier *Circus aeruginosus* and Carrion Crow *Corvus corone*) was strengthened. As a result the safety of nests and broods in the conservancy zone was substantially improved. In the reed-fields of the lake the numbers of some ducks increased markedly within a few years. Pochard increased two-and-a-half times in some places, and Coot *Fulica atra* up to three-and-a-half times.

Nevertheless, the most striking effect was produced by the complete cessation of economic activity on the islands. The increase in the number of nesting ducks on three islands, where a regular count of nests was carried out both before and after the introduction of the conservancy regulations, is demonstrated in Table I. At the same time also an increase in the number of nesting waders (island A) gulls and terns (islands B, C) was noted; the presence of these birds, particularly of gulls and terns, is of great importance for attracting ducks to the nesting grounds

Table I. Increase in numbers of nesting ducks after introduction of preserve conditions on some islands of Lake Engure, Latvia S.S.R.

The figures are of numbers of clutches found. "-3" to be read "up to 3".

	In years when pasturing was being practised (A) or hay mowed (B, C)		After cessation of economic activity						
	1948-1956	1958	1959	1960	1961	1962	1963	1964	1965
<i>All duck species on the individual islands</i>									
A Lielrova, 16 ha, devoid of trees, never fully flooded	10-15	85	70	116	163	161	164	152	134
B Akmenrova, 25 ha, with groups of shrubs, in spring, sometimes fully flooded	4-11	6	overgrown by shrubs			26	6	31	54
C Lopsalrova, 6 ha, with groups of shrubs, in spring sometimes fully flooded	4-5	10	overgrown by shrubs			13	19	37	51
<i>Individual species of ducks on all three islands.</i>									
<i>Anas platyrhynchos</i>	-3	5	13	16	24	11	12	20	18
<i>Anas clypeata</i>	-4	13	36	36	38	26	39	28	30
<i>Anas acuta</i>	0	0	0	3	3	6	8	5	8
<i>Anas querquedula</i>	-9	35	30	62	47	56	49	46	56
<i>Aythya fuligula</i>	-11	29	19	51	75	71	45	93	90
<i>Aythya ferina</i>	-3	18	7	17	39	26	31	25	27
Other species of ducks	-5	1	0	3	9	4	5	3	10
Total clutches	18-31	101	105	188	235	200	189	220	239
broods	not more than	82	69	135	136	141	121	159	114

and for the protection of their nests from birds of prey.

An adverse consequence of the cessation of economic activity (in particular, of hay mowing) consists in the islands becoming overgrown with reed *Phragmites communis* and shrubs (principally *Salix*). As a result of quick over-growing the number of duck nests began to diminish and only after clearance of shrubs did it again show signs of increase (see for example islands B and C in Table I). To avoid over-growing, in recent years, after the end of the nesting period (in July), a partial mow of grasses has been organized. This is done in strips in such a way that in spring not less than half of the area of each island remains covered with old grass, each strip being mowed once in two or three years. By observing this rule no appreciable reduction in the numbers of nests on the islands has been noted.

A special investigation of more than 70 islands on various lakes in Latvia has led to the finding that on woody islands nests of ducks are met rarely (except perhaps for single separate nests of the Mallard *Anas platyrhynchos*). By complete clearance of the woods it is often possible to transform such islands into sites for the mass nesting of ducks provided the surrounding water presents a suitable habitat for the birds. For example, on one small island (0.8 ha, or 2 acres) in Lake Engure, partly overgrown with small trees and shrubs, the number of nests remained as low as previously, after cessation of agricultural practices: in each of two consecutive years only four nests were found. In the first year after deforestation 22 nests were counted and in the following two years 25 and 28 nests.

Trees and tall bushes facilitate the activity of nest predators. Even in cases when on grassy islands there were only separate single trees the latter were often surrounded by a zone of completely ravaged and destroyed nests. It is possible that just for this reason many ducks avoid settling on islands with trees, even if the latter occupy only a small area. Thus, in autumn 1961 on the overgrown Lake Kanieris a small group of tall bushes and low trees occupying about 0.3 ha ($\frac{3}{4}$ acre) in the centre of a comparatively large grassy island (12 ha, or 30 acres) was cut. The number of duck nests on the island increased the next year from 15 to 30-35. Unless there are weighty objections on aesthetic grounds, the clearing of trees and shrubs from overgrown islands suitable for ducks must be considered as a

promising measure for encouraging large-scale nesting of ducks.

Ducks also avoid nesting on grassy islands if these are surrounded by a dense closed belt of thick reeds. Such islands which have no access to the open water are populated by ducks only in years when the spring water level is high so that the water floods the edges of the island inside the reed ring. By exterminating the dense reed thicket such islands may be converted into large-scale nesting grounds of ducks.

In recent years the creation of artificial islands was started in our republic with the objective of improving the nesting conditions of waterfowl. In autumn 1964 five such islands with an area of 0.04-0.3 ha were erected in Lake Kanieris. Already in 1965 on the still almost bare, grassless, stony and unlevelled islands ducks began to nest (according to certain sources there were more than 20 nests). The prospects of using artificial islands for ducks are quite evident.

As a result of the measures outlined above, the principal gain in numbers of ducks is in most cases due to dense settlement on islands by Tufted Duck *Aythya fuligula*, Shoveler *Anas clypeata* and Garganey *Anas querquedula*. On preserved islands suitable for ducks, high nesting densities were observed, which increased with decreasing area of the island (Table II). Observations on various inland reservoirs of Latvia have shown that a nearly equal density of nests may be attained on peninsulas subjected to preservation. Under any other conditions the density of nests was very much lower. Therefore small islands and peninsulas under rules of preservation on reservoirs for ducks may, in our view, be considered the most promising sites for massive concentrated nesting of waterfowl in densely populated districts under conditions similar to those prevailing in this country. It is comparatively simple to protect such naturally isolated localities against undesirable intruders (humans, cattle, domestic animals). The principal consideration is, however, that the layout of a broad system of small grassy islands and peninsulas with cessation of agricultural practices on them undoubtedly offers the greatest advantage for the conservation and reproduction of waterfowl with a minimum of prejudice to other branches of the economy.

The most suitable places for contriving high-density nesting grounds are low islands covered with old grass and which do not flood in spring, where the ducks may start nesting at their normal early

Table II. Density of duck nests on islands and peninsulas of various sizes.

Lake Engure 1958-1965			Lake Kanieris .1961					
Preserved islands			Unpreserved islands			Unpreserved peninsulas and islands connected with the shore		
area ha	maximum number of nests	maximum density per 0.1 ha	area ha	number of nests	density per 0.1 ha	area ha	number of nests	density per 0.1 ha
16.0	164	1.0	11.7	15	0.1	1.8	5	0.3
2.5	54	2.2	1.8	8	0.4	1.6	8	0.5
0.8	29	3.6	1.5	20	1.3	1.1	3	0.3
0.6	51	8.5	0.8	11	1.4	0.4	4	0.9
0.1	27	27.0				0.4	3	0.8

time. Violation of the normal nesting schedules, regular raids by birds of prey and mass destruction of nests are to be tolerated in no circumstances. As is confirmed by the results of ringing (including over 300 cases of repeated capture of adult hens ringed on nests or one-day-old ducklings) all the aforesaid factors entail relatively similar negative consequences. The ducks leave the unfavourable surroundings and move in search of other nesting ranges that are often less suitable or more dangerous. Even old hens frequently move to new quarters despite their having lived for several years in the place now abandoned. In almost all cases the beginning of the nesting period is delayed, and in some species (this applies undoubtedly to *Aythya fuligula*) the survival rate of late broods (delayed or repeated clutches) manifests a sharp decline. Finally, there are indications that nesting grounds abandoned by the ducks are repopulated relatively slowly for some of the young females follow the older hens which have left their previous nesting ranges because of the unfavourable circumstances.

Islands, as distinct from peninsulas, are frequently not accessible to raptorial mammals of which, under the prevailing conditions in Latvia, the Raccoon Dog *Nyctereutes procyonoides* appeared to be one of the most dangerous. Frequently it succeeds in penetrating even on to islands, in particular the islands of Lake Engure, and causes great damage. The Fox *Vulpes vulpes*, less frequently the Polecat *Mus-tela putorius*, and other mammals are also enemies of the ducks. In coastal meadows they often devastate up to 69% of all duck nests. To birds of prey, unfortunately, all large scale breeding and nesting grounds are attractive and accessible. On the overgrown reservoirs of this country the most dangerous enemies of ducks are the Marsh Harrier and Carrion Crow, and in some cases individual specimens of the Raven *Corvus corax*. Despite in-

tensified control (by shooting and trapping) raids of predatory birds increase in proportion to the growing density of nesting birds. On the experimental islands of Lake Engure birds of prey destroyed on the average 12-14% of the annual total of duck nests, this figure increasing on certain islands in some years (if control measures against the raptors were delayed in spring) to 48%. It requires no special emphasis to point out that control of birds and beasts of prey is an indispensable element in the complex of measures required in the organization of high-density nesting grounds of waterfowl.

In the prevailing circumstances the establishment of closed hunting districts is of prime importance for the preservation of waterfowl. Such districts have been established on several reservoirs of the republic. Within the boundaries of these districts (in contrast to preservation zones in the nesting period) any visits of humans during the shooting season are prohibited. In the period of heavy shooting many alarmed ducks do no more leave the reservoir but gather in the forbidden zone. There are indications that the existence of forbidden hunting districts on the large lakes (i.e. Babite, Engure, Liepaja) not only saves indigenous and migratory birds from excessive destruction but prevents also premature departure of some local and migratory birds.

The size and location of forbidden hunting districts on the reservoirs of the republic are determined in various ways depending on local conditions. The larger the area of the zone the better it fulfils its functions of preservation of waterfowl. If, however, the zone is too extensive or if it is allotted in the principal feeding places the birds do not leave the forbidden zone and become inaccessible to hunters. On the lakes Engure (44 sq. km.) and Babite (25 sq. km.) these zones at present amount to about 20-30% of the area of each lake.