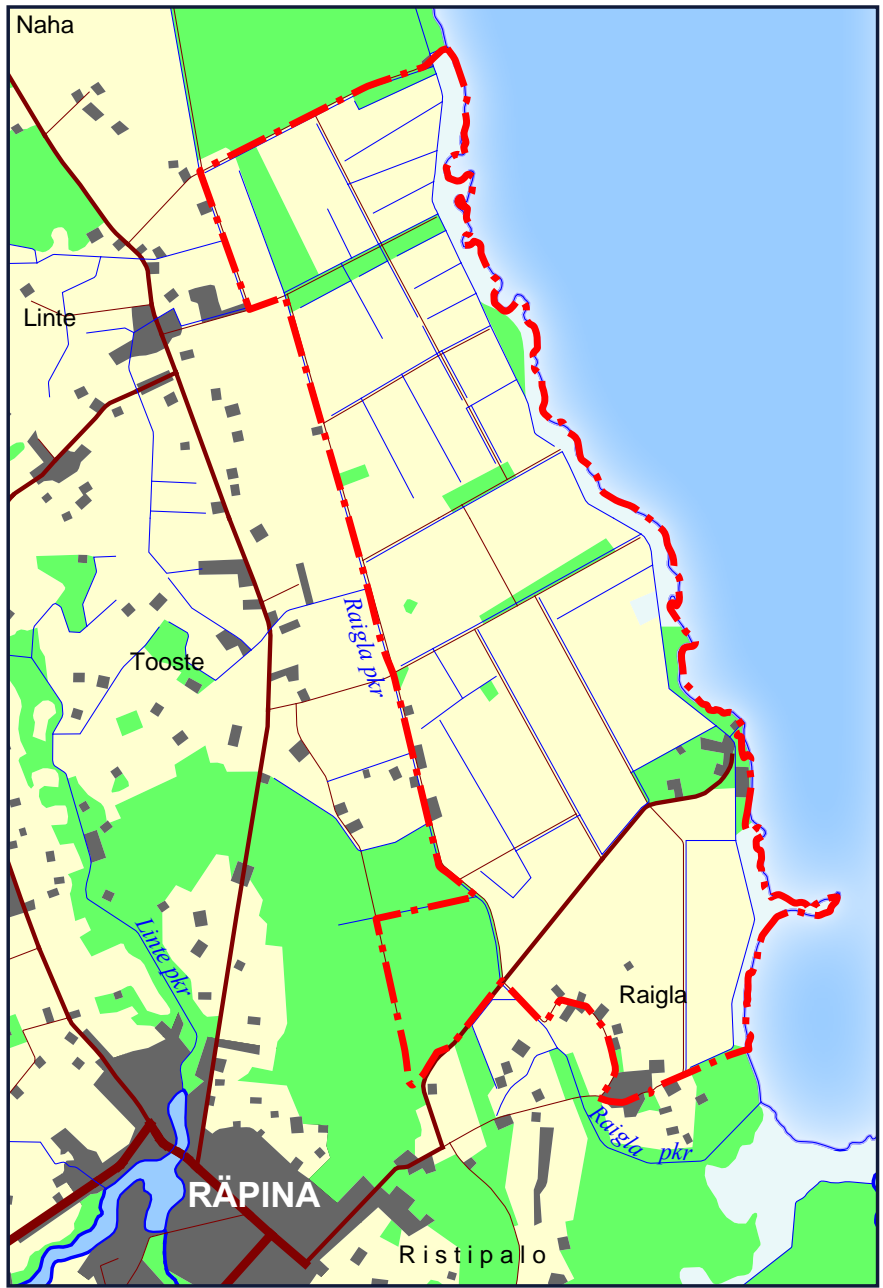




Special Protection Area of Rápina polder

The summary of the inventory 2004





The results of the inventory

The aim of the inventory was to investigate the habitat conditions and biota of the bird area, and according to the results of the research to ascertain the basic values, targets and needs of nature protection. Taking into account earlier knowledge and potential principal conservation values, the main attention was focused on the breeding avifauna and migratory assemblages. The conditions for nesting and stopover during migratory routes depend above all on the consistence, quantity and quality of food and habitat resources. Therefore, soil fauna, vegetation, ichthyofauna, amphibians, reptiles and mammals were explored as well. General and wider accepted methods were used to carry out the inventory.



□ *Earthworm*

The polder area is geologically characterised by deep moraine layer that is up to 4 meters thick. Moraine layer is covered by dusty sand layer. The latter is in turn covered by peat soil or peat bed up to 1 meter thick. Polder soils are slightly acid (pH 5.5 - 6.2). According to the data from 2004, soil moisture varies from 27 to 66 per cents being higher in the flooded areas near the lake and lower in the westward dryer areas.

The representatives of invertebrates from 15 orders and 21 genera were found in the soil and from epigeic fauna, among them 8 species of earthworms. The species richness of earthworms was the highest (7) on those grasslands that had been cleared from brushwood. Less species (3) were found on flooded grasslands. Density and biomass of earthworms per unit area was the highest on cultivated grasslands and the smallest on flooded grasslands. Earth-



□ *Carabus*

worms play an important role in meadow ecosystems and represent essential agents in the formation of soil and vegetation habitats

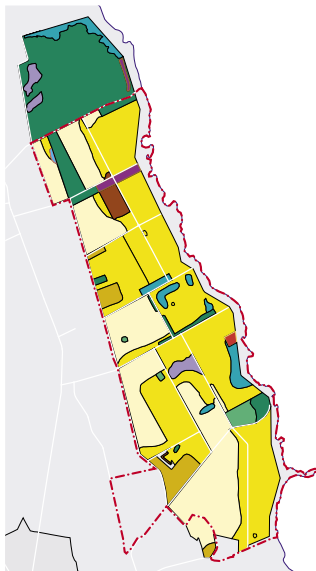
Predatory ground beetles (*Carabidae* sp) were the most abundant and species-rich among the aboveground fauna. Common Black Ground Beetle was the dominant species. Soil and aboveground invertebrates are the main food for Corn Crake and Charadriiformes, but several Passeriformes such as Sky Larks, Meadow Pipits and Wagtails feed on those creatures as well. Consequently, rich soil fauna plays an important role in the maintenance of diverse avifauna.

The species composition and richness of the soil fauna of R pina polder is quite similar to other Estonian floodplain meadows. Earthworm associations are comparatively abundant and species-rich, especially on dryer and managed areas.



Plant associations of Räpina polder

- Drained peatland forests
- Fresh boreo-nemoral forests
- Drained forests and shrubs
- Willow shrubs
- Reed-beds
- Fields
- Reed canary-grass association (*Phalaroidetum*)
- Red fescue association (*Festucetum rubrae*)
- Meadow foxtail association (*Alopecuretum pratensis*)
- Brown sedge association (*Caricetum distichae*)
- Tormentil-tufted hair grass association (*Deschampsio-Potentilletum erectae*)



Vegetation

238 vascular plant species were registered during the inventory in 2004. It forms 16.5 percent of the total number of plant species found in Estonia. More than half of the genera found in Estonia are represented here (61 genera or 54 %). Grasses (Gramineae) and aster family (Compositae) are the dominant families. High abundance of species adapted to human activities (apophytes) is characteristic. Among protected plant species, Baltic Marsh Orchid, Meadow Orchid, Common Twayblade, European White Elm, Shining Meadow Rue and Lesser Butterfly Orchid are represented here in minor numbers. All mentioned species belong to the 3rd protection category in Estonia.

Separate inventory was carried out to investigate aquatic vegetation (aquatic macrophytes). Altogether 31 aquatic vascular plant species were identified. Most abundant and far-spread were Reed Canary-grass, Common Reed, Broad-leaved Pondweed and Spiked Water-milfoil.

In general, species richness and cover of vascular plants in canals are relatively small. On the basis of the species composition of aquatic plants it may be concluded that polder waters are quite free from pollution; furthermore, the situation has improved during last years. Algal bloom is an infrequent event in the canal.

Plant associations and habitats

Räpina polder belongs vegetationally to the floodplain meadow class of the southern basin of Peipsi and to wet floodplain grassland site type. According to the classifi-

□ *Orchid*

Plant associations and biotopes of the sanctuary in 2004

Association	Area (ha)
Willow shrubs	31
Drained forests and shrubs	10
Drained peatland forests	70
Reed beds	99
Brown sedge association (<i>Caricetum distichae</i>)	3
Fresh boreo-nemoral forests	25
Fresh boreal forests	63
Red fescue association (<i>Festucetum rubrae</i>)	1
Meadow foxtail association (<i>Alopecuretum pratensis</i>)	403
Fields	43
Reed canary-grass association (<i>Phalaroidetum</i>)	664
Tomentil-tufted hair grass association (<i>Deschampsio-Potentilletum erectae</i>)	11
Total:	1422

cation of habitat types of EU Habitats Directive (92/43/EC), most of the sanctuary belongs to the type class of lowland hay meadows (6510). Altogether 13 plant associations and biotopes can be distinguished in the sanctuary.

Reed canary-grass association covers the largest area (664 ha), followed by meadow foxtail association (403 ha) and forests of different types (168 ha). The area of cultivated fields was only 43 ha in 2004.

Within the reed canary-grass association clusters of high



sedges can be found. The conditions of this association are most natural, although part of this area has been used as arable land. Meadow foxtail association is strongly variable, partly due to more intense human activities. Typical plant species of this association besides Meadow Foxtail are Brown Bent, Yellow Loosestrife, Reed Canary-grass and milfoil (*Achillea salicifolia*).

A small territory in the southern part of the polder is covered by brown sedge association. Boreo-nemoral meadows are represented on a very small territory. Patches of dry boreo-nemoral meadows can be found on the higher knolls in the western part of the sanctuary. These patches can be classified as red fescue associations. Before the establishment of polder, the area was covered by flooded overgrown mire that had been used as a hay-field at times. Higher patches were used as pastures and arable land. Rāpina polder was established to create grassland for two big cattle farms for food supply. The area of grasslands extended to 1000 hectares in 1980ies. Crops and vegetables have been grown here as well.

Polders are essentially homogeneous agricultural lands, but several additional structures and abundance of different habitats has created suitable environment for diverse biota. Stone piles on the fields are the result of past reclamation activities and are nowadays covered with dense vegetation. Red-berried Elder; several species of willows and Common Raspberry are the common representatives of woody plants. Nitrophiles (Cow Parsley, Common Nettle, Mugwort etc) are abundant among herbaceous plants. Dense vegetation of such formations offer suitable nesting places for smaller birds and refuges for wild ani-



□ *Milfoil*

imals. The seeds of the plants enrich the food supply for birds. Drained peatland forests and fresh boreal forests are main forest types. Birch, Spruce, Aspen, Common Alder and Grey Alder are the dominant tree species. Bush layer in forests is usually dense and comprises mainly willows and raspberries.

Ground layer is not so species-rich. Tufted Hair Grass, Small Balsam, Purple Small-reed, Common Nettle, European Meadowsweet and Cow Parsley are the most common species. All those stands are more or less affected by drainage.

As a whole, the plant associations of R apina polder are not very species-rich. Reed canary-grass associations that have been less affected by human activities are valuable because of their characteristic unique species composition. Other associations are experiencing more human influence, but they definitely play an integral role diversifying the landscape and offering refuges and feeding opportunities for birds as well as mammals.

The gradient of east-west slope is an additional value of the polder: Therefore floodplain meadows and fresh meadows as well as dry grasslands are present.



□ *Rosebay Willowherb*



□ *Common Frog*

Fishes and amphibians

16 fish species abide in the sanctuary. Pike, Roach, Perch and Acerin are the most common representatives. Weatherfish is the only protected fish species. The ichthyofauna of the northern part of the canal is more diverse. Pikes are abundant and Roach finds its place for spawning there. Shore area next to the lake is a suitable spawning place for different fish species from Lake Peipsi. Fishery does not have any importance in the polder; in contrary to the adjacent Lämmijärv.

Altogether 6 amphibian species were found during the inventory: Smooth Newt, Common Spadefoot, Common Toad, Common Frog, Moor Frog and Edible Frog. Presence of 3 more species is probable (European Crested Newt, Pool Frog and Lake Frog). Common Spadefoot belongs to the 2nd protection category and other species to the 3rd category in Estonia. Moor Frog is very abundant, the number of noise-making individuals was assessed approximately to 200 000 in the spring of 2004. The species has spread all over the sanctuary. The distribution pattern of Common Frog is somewhat similar to Moor Frog but this species is not so numerous. Common Toad and Edible Frog are relatively frequent, but their dispersion range comprises mainly canals and ditches, and less the flooded areas. But the abundance of Smooth Newt appeared to be rather small. This species is spread locally and preferably inhabits ponds. Common Spadefoot was found only on the embankment of the polder in Persoonõtsa.

The total abundance of amphibians in the sanctuary is approximately 300 000–400 000 and they form an essential part of this ecosystem. Several aquatic birds and birds of prey feed on amphibian spawn, tadpoles and frogs. In the viewpoint of species protection, Räpina polder is an important habitat for all amphibians found here, especially for rare Common Spadefoot and for mass spawning Common Frog and Moor Frog.



□ *Beaver dam*

Mammals

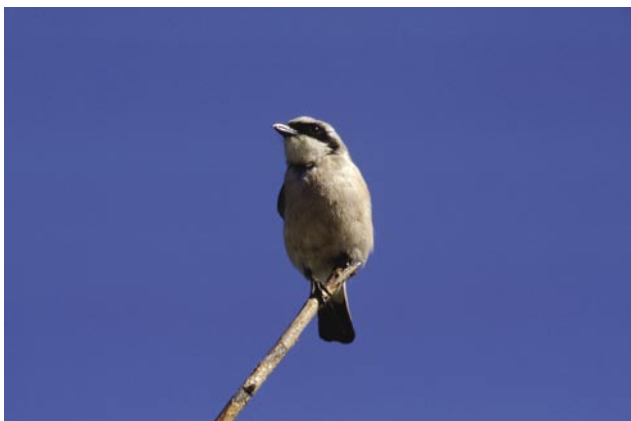
The sanctuary is rich in game species. It is inhabited by several other mammal species of whom many are directly dependent on the polder. 31 mammal species have been registered in the sanctuary. Stoat, Hermelin, Otter, Water Shrew, Common Shrew and Hedgehog represent the 3rd protection category. Wolf and Lynx have been seen out of large carnivores but the sanctuary is not their permanent habitat. The populations of Red Fox, American Mink and Raccoon Dog comprise 10-15 individuals each. They all are dangerous enemies for aquatic birds inhabiting polder and for other ground-nesting birds. The early recession of spring floods has caused drastic deaths of clutches and nestlings through ravages in several years. Therefore, the abundance of carnivores should be regulated in future.

Moose, Roe-deer and Wild Boar are among most common bovids in the sanctuary. Roe-deer and Wild Boar are



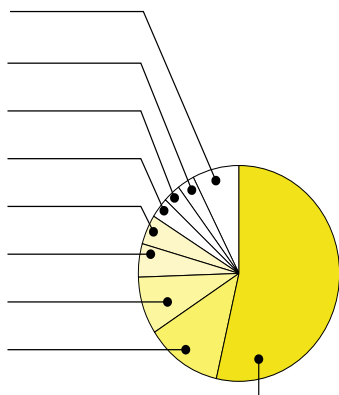
□ *Hermelin*

most abundant, 20-30 and ca 10 individuals respectively. Beaver is an important regulator of polder water level and shore vegetation. Beavers have spread all over the sanctuary and their abundance amounts to 10 ditches and 50 individuals



☐ *Red-backed Shrike*

*Birdfauna of SPA by orders
(number of species)*



Birds

One of the main values of R pina polder sanctuary is surely the diverse avifauna. 182 bird species from 18 orders have been identified here altogether. 155 species were registered in 2003 and 156 species in 2004. The dominating species group were Passeriformes (83 species = 46%), next in species richness were Charadriiformes (29 species = 16%) and Anseriformes (18 species = 10%). 138 species from 15 orders comprise the nesting avifauna, 100 species of those are regular nesters here. In this species group Passeriformes are dominant species as well (74 species = 54%), followed by Charadriiformes

Abundance of most important bird species of Rāpinapolder sanctuary in 2004

Bird species	Number of breeding pairs	Stops during spring migration (max no of individuals)
Great Bittern	3-4	
Bean Goose		400
Greater White-fronted Goose		8500
Spotted Crake	30-40	50
Corn Crake	80-100	
Ru	1-3	150
Black-tailed Godwit	10-15	40
Common Redshank	15-25	50
Little Gull	70-100	200
Black Tern	50-70	200
Short-eared Owl	1	

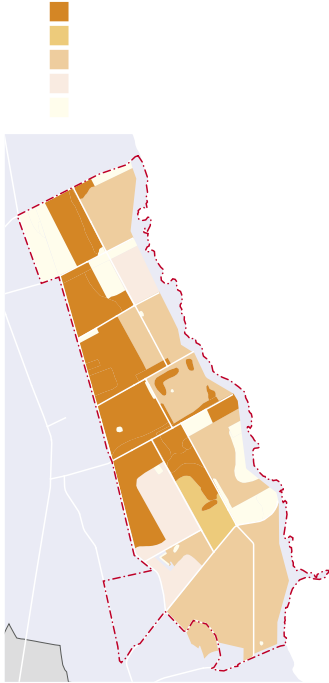
(17 species = 12%) and Anseriformes (12 species = 9%).

6 species from the 1st Estonian protection category have been identified in the sanctuary during last years (White-tailed Eagle, Lesser Spotted Eagle, Greater Spotted Eagle, Osprey, Merlin, Ru). 18 species from the 2nd protection category and 43 species belonging to the EU Bird Di-



□ *Little Gull's nest*

Population density of Corn Crake in the sanctuary (singing birds/100ha).



□ *Black Tern*

rective list of Annex 1 have been registered here. From species of the 1st protection category Lesser Spotted Eagle and Ru are nesting in the sanctuary; other species are foraging here. Other possible rare breeding species in the sanctuary are Black-necked Grebe, Little Crake and Great Snipe.

The most abundant nesting species are Black-headed Gull (up to 500 pairs), followed by Little Gull and Black Tern (both up to 200 pairs). Other abundant species are Corn Crake, Common Coot, Northern Lapwing, Sky Lark, Sedge Warbler, Common Whitethroat and Chantrelle (all up to 100 pairs). In reference to Estonian bird populations, there are nesting in important numbers next bird species: Little Gull (up to 7% of Estonian population), Black Tern (up to 5%), Short-eared Owl (2%), Ru (1%), Black-tailed Godwit (1%), Spotted Crake (0.6%) and Corn Crake (0.5%). R pina polder belongs to 10 most representative areas among our nature reserves and important bird areas as important nesting place for Spotted Crake, Corn



□ *Corn Crake*

Crake, Common Coot, Northern Lapwing, Ring-billed Gull, Little Gull, Black-headed Gull and Black Tern. Altogether 2000-3000 pairs of birds nest in the sanctuary, the average density of inhabitants is consequently 170 pairs per 100 hectares. Especially noteworthy is the density of Common Crake: the number of singing individuals reached to 44 per 100 hectares on the dryer grassland in the western part of the polder in 2004. This is the highest population density of Common Crake known in Estonia.

More than a million birds from over hundred species pass through the sanctuary during migration. There are days when the migration seems to proceed perpetually and although most of the birds do not stop in the sanctuary for longer period, several species may form larger and more permanent migratory assemblages.

Geese are the most outstanding and abundant birds during spring migration. The number of Greater White-fronted Geese extended to 8500 and of Bean Geese to 400 indi-

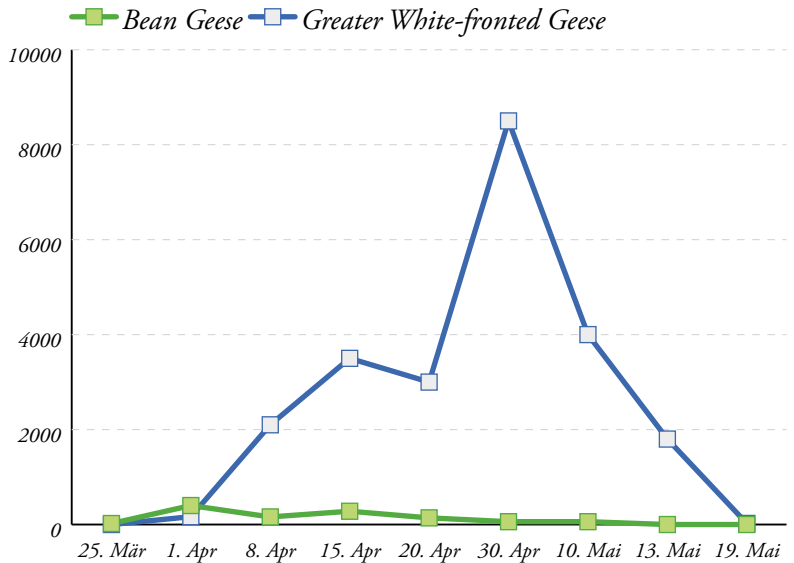


□ *Black Tern's nest*



☐ *Flocks of geese on the polder*

The results of the counting of Bean Geese and Greater White-fronted Geese during spring migration in 2004



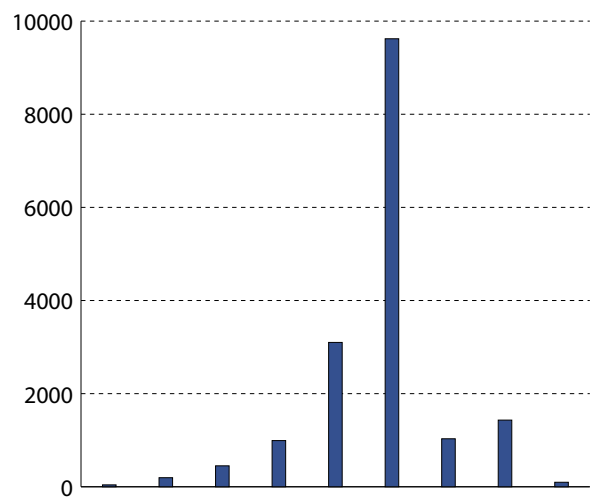
viduals. R pina polder is one of the three most important stopping spots for Greater White-fronted Geese in Estonia and up to 1 % of European biogeographical population stopover here

Besides geese, up to 500 Eurasian Wigeons, 400 Mallards, 250 Tufted Ducks and 150 Northern Shovelers stopped in the sanctuary during spring migration in 2004. Up to 150 Ru s, approximately a hundred Wood Sandpipers and as much Common Snipes were counted among Charadriiformes. Other interesting species that have been seen during spring migration are Barnacle Goose and Red-necked Phalarope.



□ *Eurasian Wigeon*

The number of migratory birds counted within 1 morning hour in autumn 2004



Autumn migration begins in August, culminates in the second half of September and ends in November. Chanh and Barn Swallow were the most numerous species in the autumn of 2004. 1700 Chanhes and 6000 Barn Swallows were counted within an hour from observation tower. The sum of the day of all migratory birds on the polder reached maximally 77 000 on 24 of September.

Because of the bird species composition and nature preservation values the main purpose of the Rāpina polder sanctuary is to protect the nesting places and migration conditions of Great Bittern, Greater White-fronted Goose, Garganey, Lesser Spotted Eagle, Spotted Crake, Corn Crake, Ru, Black-tailed Godwit, Little Gull, Black Tern and Short-eared Owl. The maintenance of optimal habitat conditions for Corn Crake, Little Gull and Black Tern is the main priority.



□ *Migrating Common Cranes*



□ *Bird observation tower of R pina polder sanctuary*

Research workers responsible for the inventory

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Arvi Lepisk Spring migration

Henn P mamets Transect counting of breeding birds of open landscapes

Anneli Palo Aquatic vegetation

Elle Roosaluuste Vegetation and vegetation communities

Nikolai Laanetu Fish, amphibians, reptiles and mammals

Riho Kinks Additional observations of nesting birds and migration



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