

## DIETS OF THE PYGMY OWL *GLAUCIDIUM PASSERINUM* AND TENGMALM'S OWL *AEGOLIUS FUNEREUS* IN THE GULF OF KANDALAKSHA AREA, WHITE SEA

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The material was gathered from the islands and mainland coast at the head of the Gulf of Kandalaksha, White Sea. Information on the Pygmy Owl is mainly focused on the winter diet determined by pulling apart the cast pellets and food caches which the owls placed in passerine nest boxes during autumn and winter. Data on Tengmalm's Owl includes only the composition of cast pellets collected from nests. The diet of both species included rodents, insectivores and birds. Stores made by the Pygmy Owl were found to contain 5 vole species (*Clethrionomys glareolus*, *Cl. rufocanus*, *Cl. rutilus*, *Microtus oeconomus*, *M. agrestis*), 2 lemming species (*Lemmus lemmus*, *Myopus schisticolor*), 1 shrew species (*Sorex araneus*) and ca. 10 passerine species. Cast pellets of Tengmalm's Owl contained only 3 vole species (*Cl. glareolus*, *M. oeconomus*, *M. agrestis*), 1 shrew species (*S. araneus*), several passerine species and remains of insects.

**Key words:** Eurasian Pygmy Owl, Tengmalm's Owl, diet, Gulf of Kandalaksha, White Sea, *Glaucidium passerinum*, *Aegolius funereus*

**ПИТАНИЕ ВОРОБЬИНОГО *GLAUCIDIUM PASSERINUM* И МОХНОНОГОГО *AEGOLIUS FUNEREUS* СЫЧЕЙ В РАЙОНЕ КАНДАЛАКШСКОГО ЗАЛИВА, БЕЛОЕ МОРЕ. Н.С.Бойко, Е.В. Шутова.** Кандалакшский государственный природный заповедник.

Материал собран в районе островов и материкового побережья в вершине Кандалакшского залива Белого моря. Для воробьиного сыча рассмотрено в основном зимнее питание по результатам разбора погадок и запасов пищи, которые сычи в осенне-зимний период устраивают в искусственных гнездовых для воробьиных птиц. Для мохноногого сыча приводится только состав погадок, собранных из гнезд. В питании обоих видов встречены грызуны, насекомоядные и птицы. В запасах воробьиного сыча обнаружены 5 видов полевок (*Clethrionomys glareolus*, *Cl. rufocanus*, *Cl. rutilus*, *Microtus oeconomus*, *M. agrestis*), 2 вида леммингов (*Lemmus lemmus*, *Myopus schisticolor*), 1 вид землероек (*Sorex araneus*) и около 10 видов воробьиных птиц. В погадках мохноногого сыча отмечены только 3 вида полевок (*Cl. glareolus*, *M. oeconomus*, *M. agrestis*), 1 вид землероек (*Sorex araneus*), несколько видов воробьиных птиц и остатки насекомых.

**Ключевые слова:** воробьиный сыч, мохноногий сыч, питание, Кандалакшский залив, Белое море, *Glaucidium passerinum*, *Aegolius funereus*.

The Pygmy Owl and Tengmalm's Owl inhabit forests of Eurasia from the Atlantic to the Pacific. In the Kola Peninsula, the limit for the distribution range of both species is the northern timberline. Sightings are rare due to low abundance and secretiveness of the birds.

Our material was collected from the islands and mainland coast of the Gulf of Kandalaksha, White Sea. Additionally, Kandalaksha Reserve archival data since 1955 were used. Surveys were done on islands of the Severnyi and Luvengskiy archipelagoes, on the Karelian and Kandalaksha mainland coasts opposite the archipelagoes, on Velikiy Island, in Porja Guba Bay and adjacent mainland areas (fig. 1). The diets were determined by pulling apart the food caches, cast pellets and food remains collected from the Severnyi and



**Figure 1.** Map of the study area in the Gulf of Kandalaksha. Black circles show localities with nest-boxes.

Luvengskiy archipelagoes and from the mainland in the Luvenga village area. Material on the Eurasian Pygmy Owl includes 153 food caches and "eating areas" and 54 cast pellets from nest boxes; material on Tengmalm's Owl 42 cast pellets and food remains from 2 nests.

**Pygmy Owl *Glaucidium passerinum***

Rare species. Considered to be breeding in the Kola Peninsula (Bianki et al. 1993), but no reliable evidence is available so far. Singular birds were usually seen or heard on the islands and coast of the Gulf of Kandalaksha and in the Lapland reserve (Semyonov-Tyan-Shansky & Gilyazov 1991). In Finland, north of the Arctic Circle, breeding has been confirmed by observations (Väisänen et al. 1998).

There have been 25 Pygmy owl encounters in the Gulf of Kandalaksha from 1955 to 2005. The first one occurred in 1958 with no further encounters until 1973. The situation in the Lapland reserve was the same – not a single Pygmy Owl encounter was recorded there in the 1960s. Apparently, the Murmansk region population of the species declined or, possibly, even went extinct at the time. Since the early 1970s,

Pygmy owls have been encountered more or less regularly, recorded 24 times over 14 years. The finds of "caches" and "eating areas" of the Pygmy Owls made in winter in nest boxes indicate their nearly annual presence in the study area (for 25 out of 33 years). All actual bird encounters took place from August to April, not a single bird sighted during the breeding season. In some summers, however, nest boxes were found to contain devastated passerine nests with females or nestlings consumed and prey body fragments (wings, feet, headless carcasses) or crippled nestlings remaining. Since the Pygmy Owl typically tears prey into pieces before eating, one can assume that it was this species that had ravaged the nests.

In winter, Pygmy Owls often use cavities and nest boxes for caching food. We usually found traces of their presence in nest boxes during first spring checks. Mounting of nest boxes began in 1971 on islands and in 1991 in the mainland. Their number gradually increased from 20 to 470. Nest boxes have been placed on 7 islands and 2 sites on the mainland coast (see fig. 1, tab. 1).

**Table 1.** Occupation of nest boxes by the Pygmy Owl on the Gulf of Kandalaksha in 1973–2005.

Winter season	Number of nest boxes			Number of stored animals			Localities*	
	inspected	with stored animals	with animal remains	with pellets	total	mean		maximum
1973/74	108	3	0**	1	12	4.0	?	R
1974/75	130	0	0	0				
1976/77	170	0	0	0				
1977/78	224	0	0	0				
1978/79	289	0	8	0				R, Lo
1979/80	332	1	0	0	2	2.0	2	R
1980/81	356	0	0	0				
1981/82	376	0	1	0				R
1982/83	401	15	16	1	164	10.9	51	BV, Lo, R
1983/84	420	0	2	0				R
1984/85	422	3	2	0	4	1.3	2	BV
1985/86	379	0	0	0				
1986/87	384	0	0	0				
1987/88	412	10	2	0	12	1.2	2	R
1988/89	411	1	0	0	1	1.0	1	BV
1989/90	402	0	0	0				
1990/91	415	1	0	1	1	1.0	1	R
1991/92	443	2	0	0	4	2.0	2	DL, Lu
1992/93	450	0	2	0				BV, K
1993/94	438	1	1	0	1	1.0	1	Lu
1994/95	417	0	0	0				
1995/96	369	14	0	0	107	7.6	21	Lu
1996/97	466	0	1	0				Lu
1997/98	434	0	0	0				
1998/99	429	0	0	0				
1999/00	420	17	3	0**	123	7.2	30	Lo, Lu, R
2000/01	438	5	0***	2	5	1.0	1	BV, Lu, R
2001/02	446	11	3	1	34	3.4	5	A, BV, Lo, Lu, R
2002/03	442	15	2	2	104	6.9	25	BV, Lo, Lu, R
2003/04	430	7	2	3	19	4.8	13	BV, Lu
2004/05	454	5	0	0	53	13.2	29	Lu

Note: \* - Localities: A – Anisimov Island, BV – Bereznoi Vlasov Island, D – Devichya Luda Islet, K – Karelian coast, Lo – Lodeinyi Island, Lu – Luvenga village area, R – Ryashkov Island.

\*\* - animal remains or cast pellets found in nest boxes with stored animals,

\*\*\* - animal remains found in nest boxes with cast pellets.

Most islands and coastal localities with nest boxes are no more than 1 km<sup>2</sup> in area, only the largest one, Ryashkov Island, has an area of ca. 4 km<sup>2</sup>. Since the winter range of one bird or a pair of Pygmy Owls is 1.5 to 4 km<sup>2</sup> (Pukinskiy 1977; Golodushko & Samosenko 1961), all food stores found in one island or mainland locality were probably cached by one bird. Usually, the distance between nearest "caches" was 50 to 350 m, reaching 1.5 km in the Ryashkov Island only. Judging by the use of nest boxes, Pygmy Owls come to the study area virtually every year (tab. 1). In some years there was definitely more than one bird because caches were found 2 to 14 km apart. It appears that the greatest number of birds (probably 3–5) were present in the study area in the winter of 1982/83 and from 1999 to 2003.

A total of 784 food items were found in the caches, eating sites and cast pellets over all study years. An overwhelming majority of these were mammals (90.8%), chiefly rodents (85.8%). Insectivores contributed as little as 5.0%, birds were slightly more frequent – 9.2%. The species composition of the Pygmy Owl prey is shown in tab. 2. As regards

small mammals, the diet comprised *Muridae* and *Sorex* species common the area. Also present was the quite rare common vole *Microtus arvalis*, first discovered in the Murmansk region in 1981 (Kataev et al. 1999) and occurring in the Kandalaksha and Luvenga areas since 1999. Voles found in caches were mostly young individuals (94.7%, and 2.0% were younger than 1 month) compared to 5.3% of overwintered ones, which corresponds to a typical age ratio of voles in autumn. The species composition of birds in the prey was far more diverse, but most of them occurred not so frequently. Common species prevailed, but some relatively rare ones in the area, like the Coal Tit *Parus ater* and the Long-tailed Tit *Aegithalos caudatus* were also recorded. Thus, Pygmy Owls do not focus on specific species, but hunt any feasible prey. They can even take birds weighing almost as much as themselves, e.g. crossbills *Loxia* sp. A case is known when a woodpecker was hunted (Pukinskiy 1977). Non-selectivity is confirmed also by the fact that different rodent species prevailed in different years and locations among the prey depending on their availability. On Lodeinyi Island, e.g., about a half

**Table 2.** Diet of the Pygmy Owl in the head of the Gulf of Kandalaksha.

Species	Stored animals	Animal fragments	In pellets	Total	
				no	%
<i>Clethrionomys rufocanus</i>	35	0	2	37	4.7
<i>Clethrionomys glareolus</i>	140	5	20	165	21.0
<i>Lemmus lemmus</i>	2	1	2	5	0.6
<i>Myopus schisticolor</i>	36	1	0	37	4.7
<i>Microtus oeconomus</i>	24	4	7	35	4.5
<i>Microtus agrestis</i>	190	1	5	196	25.0
<i>Microtus arvalis</i>	11	0	0	11	1.4
Cricetidae, sp.	121	45	21	187	23.9
All rodents	559	57	57	673	85.8
<i>Sorex araneus</i>	12	0	0	12	1.5
<i>Sorex caecutiens</i>	2	0	0	2	0.3
<i>Sorex</i> sp.	19	5	1	25	3.2
All insectivores	33	5	1	39	5.0
All mammals	592	62	58	712	90.8
<i>Anthus</i> sp.	0	1	0	1	0.1
<i>Motacilla alba</i>	2	2	1	5	0.6
<i>Aegithalos caudatus</i>	1	0	0	1	0.1
<i>Parus montanus</i>	12	0	0	12	1.5
<i>Parus cinctus</i>	4	0	0	4	0.5
<i>Parus ater</i>	1	0	0	1	0.1
<i>Parus major</i>	9	3	1	13	1.7
<i>Parus</i> sp.	2	0	0	2	0.3
<i>Passer domesticus</i>	2	0	0	2	0.3
<i>Fringilla coelebs</i>	0	1	0	1	0.1
<i>Fringilla montifringilla</i>	0	1	1	2	0.3
<i>Acanthis flammea</i>	3	2	0	5	0.6
<i>Acanthis hornemanni</i>	2	0	0	2	0.3
<i>Loxia pytyopsittacus</i>	0	1	0	1	0.1
<i>Loxia curvirostra</i>	0	1	0	1	0.1
<i>Loxia</i> sp.	0	1	0	1	0.1
<i>Pyrrhula pyrrhula</i>	0	3	0	3	0.4
<i>Emberiza citrinella</i>	0	1	0	1	0.1
<i>Plectrophenax nivalis</i>	1	3	0	4	0.5
Passeriformes, sp.	1	4	5	10	1.3
All birds	40	24	8	72	9.2
Total	632	86	66	784	

(52.0%) of animals in caches were bank voles *Clethrionomys glareolus*, and 24% field voles *Microtus agrestis*. In the spring of 1983, however, 89.5% of the 187 animals stored by the Pygmy Owl were field voles. The number of species and prevalence of one species or another in the caches correlated quite well with their occurrence in the habitats. Thus, bank voles on the Ryashkov Island made up 96% in total rodent counts, and 80% in the Pygmy Owl diet. The species diversity of rodents in the mainland near Luvenga is higher than on the islands, and the Pygmy Owl diet was found to include 7 species (vs. 4 on the islands). The dominant species here, too, was the bank vole, but its proportion in caches was much lower than on the islands, just 34.2%, on average; about equal proportions were contributed by the grey-sided vole *Clethrionomys rufocanus*, the field vole, the root vole *Microtus oeconomus* and the wood lemming *Myopus schisticolor* (10–15% each). The species ratio, however, varies notably among years (tab. 3). When winter stores were low, the proportion of birds in the caches increased to 30–33% (2000/2001 and 2001/2002). Given these significant variations between years one should be very careful when comparing the diets of Pygmy Owls from different parts of the range, especially when the study period is relatively short.

Where possible, the Pygmy Owl establishes distinctly separate areas for caching food, eating and rest (Likhachev 1957). Nest boxes containing stored animals, food remains and cast pellets simultaneously were quite rare. In our study area, nest boxes containing only stored animals accounted for 62.1% of all those used by Pygmy Owls (166), boxes with only food remains 28.3%, and boxes with only cast pellets 3.6%. Only 6.0% of the nest boxes included both stored animals and cast pellets, stored animals and food remains, or cast pellets and food remains. One may note that Pygmy Owls most often use nest

boxes for storing food. The stores are partially or fully consumed by the birds during the winter. In some years we found only cast pellets and remains of animals and birds in nest boxes. Each nest box contained 1 to 51 objects. Those with 1–2 specimens prevailed (tab. 4). On islands, such stores were 1.7 times more frequent (61.2%) than in the Luvenga area (36.4%). The only time large stores made by the Eurasian Pygmy Owl were found on an island was on Lodeinyi Island in the winter of 1982/1983, when 162 animals were collected from 12 nest boxes. In the Luvenga area, on the contrary, more than a half of caches comprised at least 5 specimens each. The difference may be related to the pattern of stay and duration of food caching. Apparently, they are most of the time resident in the mainland staying within the same area, whereas the islands are most probably quite shortly visited by nomadic birds.

Pukinskiy (1977) writes that foods are actively cached in autumn, before the snow cover establishes. In 2002–2005, we examined nest boxes both in spring and in autumn. In 2002 and 2004, full caches were found on October 24–27. The snow cover in these years established on 24 October and 10 November, respectively. Food cached later in these winters contributed 19.0% and 3.6%. In 1982 and 1995, when Pygmy Owls also stored food very actively, snow covered the ground even earlier – on 14 and 22 October. In years with a later winter and snowless November (1996, 2000) stores were small. It turns out that the activeness of food caching by the Pygmy Owl in the Murmansk region is independent of the timing of the snow cover formation and snow depth in the early winter, as pointed out by Likhachev (1957, 1971) for the Prioksko-Terrasnyi reserve. On average, the snow cover in the region establishes on 25 October, and most food stores seem to be cached by mid-October. A confirmation is the finds in the stores of the Long-tailed

**Table 3.** Composition (%) of the diet of the Pygmy Owl in the Luvenga area, 1999–2005.

Species	Winter season					
	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05
<i>Clethrionomys rufocanus</i>	6.7	0.0	0.0	15.8	4.2	20.8
<i>Clethrionomys glareolus</i>	27.4	11.1	23.1	48.5	16.7	9.4
<i>Myopus schisticolor</i>	0.0	0.0	0.0	0.0	2.1	56.6
<i>Microtus oeconomus</i>	18.1	11.1	15.4	5.0	10.4	0.0
<i>Microtus agrestis</i>	27.6	0.0	0.0	8.9	6.2	5.7
<i>Microtus arvalis</i>	7.6	0.0	0.0	3.0	0.0	0.0
Cricetidae, sp.	5.7	44.4	15.4	1.0	47.9	1.9
Soricidae, sp.	6.7	0.0	15.4	13.9	2.1	3.8
Birds	2.9	33.3	30.8	4.0	10.4	1.9
Total individuals	105	18	13	101	48	53

**Table 4.** Number of animals in the stores made by the Pygmy Owl on the islands and in the mainland coast (%).

Location	Number of animals in one store						Number of stores
	1–2	3–4	5–10	11–20	21–30	> 30	
Islands	61.2	16.7		20.0		1.6	60
Mainland: Luvenga area	36.4	6.8	20.5	22.7	13.6	0.0	44

Tit *Aegithalos longicaudus*, which appears in the area in the first half of October. Pygmy Owls, however, do some minor food caching in winter and spring, too. On Ryashkov Island, we found recent food remains from March to May 20. The Pied Wagtails *Motacilla alba*, Bramblings *Fringilla montifringilla*, Chaffinches *Fringilla coelebs*, Snow Buntings *Plectrophenax nivalis* seen among the stores and remains had also been most probably taken in spring. The caches and eating areas with 1–3 items are also more likely to have been made in the winter and spring season. The proportion of birds there is much higher (27.0%) than in larger autumn stores (meagre 1.5%). This is quite natural given that in autumn, especially when the abundance of rodents is high, they are the most easily available prey, whereas in wintertime rodent hunting is difficult and Pygmy Owls hunt birds more often. In some regions, birds prevail over mammals in the winter diet of owls; in Central Europe birds accounted for 61.6% of all prey (Vorontsov et al. 1956). A similar idea was expressed by Likhachev (1957). In the North, however, the role of birds is not so significant because of the low number of resident, winter resident and nomadic species and their relatively low abundance. Judging by the relatively high number of Great Tits *Parus major* and finds of House Sparrows *Passer domesticus* in Pygmy Owl food in the Luvenga area, as well as by two encounters of Pygmy Owls in the village in wintertime, they often visit settlements to hunt. Cases are known when the Pygmy Owl hunted tits at feeders (Malchevskiy & Pukinskiy 1983).

#### **Tengmalm's Owl *Aegolius funereus***

Uncommon or rare breeder. In the winter season, Tengmalm's Owls apparently leave for more southern parts of the range, since not a single encounter has been recorded from December to February. Only 50 encounters were recorded from the area over 50 years of surveys (in 23 of the 50 years). A substantial part of the encounters (22) is from the Velikiy Island, where lekking birds were often heard from March to May. Records from the Severnyi Archipelago at the head of the Gulf of Kandalaksha include 16 encounters. Pygmy Owl records from the Karelian and Kandalaksha mainland coasts, Porja Guba Bay and Cape Turij are fewer (1–3 encounters in each area), but the reason is most probably the shorter period of observations in the areas. To make a nest, the Tengmalm's Owl needs spacious cavities with a wide entryway. In natural settings, abandoned nests of the Black Woodpecker *Dryocopus martius* are best suited for that (Pukinskiy 1977). In northern forests, however, Black Woodpeckers are few and the Pygmy Owl suffers a deficit of suitable nesting sites. As the result, they often settle in nest boxes made for the Goldeneye *Bucephala clangula* (8 of the 10 known nests were in Goldeneye nest boxes). The earliest time juveniles are known to have left the

nest was on 6 June 1958, i.e. egg laying in the nest began early in April. In the rest of the nests, clutches appeared in late April – first half of May. The size of the clutches was 3 to 7 eggs.

The diet of Tengmalm's Owl in summertime can be judged by the composition of 42 cast pellets and food remains collected from 2 nests on Ryashkov Island (Severnyi Archipelago) in 1981, 1984 and 1991. Each pellet contained the remains of 1–3 objects, 1.5 specimens on average. Pellets with 1 mammal accounted for 61.9%, with two mammals 7.1%, with three 2.4%, with a mammal and a bird 23.8%, with two mammals and a bird 4.8%. All in all, fragments of 109 food items were collected from nests and cast pellets. One can see from tab. 5 and 6 that the main prey for Tengmalm's Owl in the Murmansk region is small mammals, chiefly rodents (70–85%). The role of shrews in the species diet is insignificant. The species composition of hunted mammals may vary notably across years and depending on the place where the material was gathered from. Thus, field voles (22.0%) and bank voles (19.2%) prevailed on the relatively small Ryashkov Island with its highly mosaic taiga vegetation and a belt of coastal meadows among the lengthy coastline, whereas in the more homogeneous forests of the Lapland reserve 57% were contributed by the grey-sided vole and 12.5% by the Norway lemming *Lemmus lemmus* (Semyonov-Tyan-Shansky & Gilyazov 1991). Furthermore, the proportions of individual species varied notably across years depending on their abundance. In the Lapland reserve, Norway lemmings accounted for 35.3% in 1982, but only for 6.3% in 1983; grey-sided voles contributed 33.3% in 1982, and 82.5% in 1983. Contributions of other animal groups in Tengmalm's Owl diet also vary significantly in different locations. On islands, where the density of passerine birds is much higher than in mainland forests (Shutova 1989), their role in the diet is also higher. Passerines became prey several times more often there (19.3% of all food items) than in the Lapland reserve (2.8%). Table 5 demonstrates that Tengmalm's owl took only small passerines, although the species is known to hunt larger ones as well – pellets from the Lapland reserve were found to contain woodpecker remains (Semyonov-Tyan-Shansky & Gilyazov 1991), and a thrush hunt was observed in the Severnyi Archipelago. Like other owl species, Tengmalm's Owl may practice cannibalism (Kadochnikov 1962; Pukinskiy 1977). A pellet we took from a nest contained a ring and remains of the youngest owlet in the brood. In the mainland, when small rodents are in deficit, Tengmalm's Owl may eat frogs (tab. 6), which are missing from islands in the sea. Insects, although occasionally found in cast pellets, are too few to play any role in the species diet.

One may note from tables 5 and 6 that nest contents and cast pellets differ markedly in the ratio of animal groups. Cast pellets contain more of shrews and insects, whereas nests more of bird re-

mains. Apparently, fragments of larger objects are more likely to remain in the nest, whilst small mammals and insects are nearly always swallowed whole and remain in the nest only as cast pellets, part of which are trampled down by nestlings so that some objects become unidentifiable. As regards birds, Tengmalm's Owl plumes them before eating so that nests grow littered with feathers. Then sorting such remains out, one is likely to exaggerate the role of birds compared to mammals. Our ac-

counts indicate the lowest possible number of birds from nest material.

The summer diet of Tengmalm's Owl on Ryashkov Island included equal numbers of adult and juvenile voles (50% each), the age of which was determined (n=58), and 3.4% of juveniles were younger than 1 month. This age ratio is typical also for the habitat in the period. We saw no preference for a certain age class in Tengmalm's Owl's hunts.

**Table 5.** Diet of Tengmalm's Owl on the Severnyi Archipelago.

Species	In pellets	In nests	Total
Mammals			
Rodents			
<i>Clethrionomys glareolus</i>	9	12	21
<i>Clethrionomys rufocanus</i>	3	0	3
<i>Microtus agrestis</i>	10	14	24
<i>Microtus oeconomus</i>	1	2	3
<i>Cricetidae</i> , sp.	23	0	23
Insectivores			
<i>Sorex araneus</i>	3	0	3
<i>Sorex caecutiens</i>	1	1	2
<i>Sorex</i> sp.	1	0	1
Birds			
<i>Motacilla alba</i>	1	2	3
<i>Ficedula hypoleuca</i>	0	1	1
<i>Phoenicurus phoenicurus</i>	0	1	1
<i>Parus cinctus</i>	1	0	1
<i>Fringilla montifringilla</i>	1	1	2
<i>Acanthis flammea</i>	0	2	2
<i>Pyrrhula pyrrhula</i>	1	2	3
Passeriformes, sp.	6	1	7
<i>Aegolius funereus</i> , pull	0	1	1
Insects			
Hymenoptera: <i>Camponotus herculeanus</i>	7	0	7
Coleoptera: <i>Cerambycidae</i>	1	0	1
Total individuals	69	40	109

**Table 6.** Diet of Tengmalm's Owl on the Gulf of Kandalaksha Bay and in the Lapland reserve.

Taxon	Gulf of Kandalaksha						Lapland reserve	
	from pellets		from nests		total		total	
	n	%	n	%	n	%	n	%
Rodents	46	66.7	28	70.0	74	67.9	182	84.3
Insectivores	5	7.2	1	2.5	6	5.5	2	0.9
Mammals	51	73.9	29	72.5	80	73.4	184	85.2
Birds	10	14.5	11	27.5	21	19.3	6	2.8
Amphibians	0	0.0	0	0.0	0	0.0	21	9.7
Insects	8	11.6	0	0.0	8	7.3	5	2.3
Total	69		40		109		216	

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## REFERENCES

- Bianki, V.V., Kohanov, V.V., Koryakin, A.S. et al. 1993. Birds of the Kola-White Sea Region // Russian Journal of Ornithology. Vol. 2, No 4: 491–586. [in Russian]
- Golodushko, B.Z., Samusenko, E.G. 1961. Diet of the Pygmy Owl in Belovezhskaya Pushcha // Bird ecology and migrations in the Baltic region. Proceedings of the 4<sup>th</sup> Baltic Ornithological Conference. Riga, July–August 1960. Riga. Latvian SSR Academy of Science Press: 135–140. [in Russian]
- Kadochnikov, N.P. 1962. Observations over nesting and feeding of Tengmalm's Owl (*Aegolius funereus* L.) // Journal of Zoology, Vol. 41, No 3: 465–467. [in Russian]
- Kataev, G.D., Makarova, O.A., Boyko, N.S. 1999. Species diversity and status of mammal communities in the Kola Peninsula // Rare mammal species in Russia and adjacent regions. Collected papers. Aristov, A.A., ed. Moscow: 147–153. [in Russian]
- Likhachev, G.N. 1957. Winter use of nest boxes by the Pygmy Owl // Transactions of the Prioksko-Terrasnyi Strict Nature Reserve. No 1. Moscow: 287–290. [in Russian]
- Likhachev, G.N. 1971. Data on the Pygmy Owl diet // Transactions of the Prioksko-Terrasnyi Strict Nature Reserve. № 5. Moscow, "Lesnaya promyshlennost" publishers: 135–145. [in Russian]
- Malchevskiy A.S., Pukinskiy, Yu.B. 1983. Birds of the Leningrad Region and adjacent areas. History, biology, conservation. Vol.1. Leningrad: 480 p. [in Russian]
- Pukinskiy, Yu.B. 1977. Owl life. Series: Life of our birds and animals. № 1. Leningrad. Leningrad University press. 240 p. [in Russian]
- Semyonov-Tyan-Shansky O.I., Gilyazov A.S. 1991. Birds of Lapland. Moscow, "Nauka" publishers: 287 p. [in Russian]
- Shutova, E.V. 1989. Breeding density of forest passerine birds and their distribution on the Gulf of Kandalaksha Islands // Ecology of birds inhabiting sea islands and coasts of the Kola North. Murmansk: 101–114. [in Russian]
- Väisänen, R.A., Lammi, E., Koskimies, P. 1998. Muuttuva pesimälinnusto. Helsingki. Otava: 567 p.
- Vorontsov, N.N., Ivanova, O.Yu., Shemyakin, M.V. 1956. Data on the winter diet of the Pygmy Owl // Journal of Zoology. Vol. 35, No 4: 615–618. [in Russian]