

DISTRIBUTION AND DENSITY OF COYPU (*MYOCASTOR COYPUS* (MOLINA, 1782)) IN DOWNSTREAM OF MARITSA RIVER SOUTHEAST BULGARIA

Gradimir Gruychev

Department of Wildlife Management, Faculty of Forestry, University of Forestry, 10 Kliment Ohridski Blvd., 1797 Sofia, Bulgaria. E-mail: gradi.val@gmail.com

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Abstract

The distribution and density of Coypu were researched in the downstream of the Maritsa River. Twenty-four new localities were found, twenty of them are situated along the Maritsa River. Three more new localities were found in ponds near the researched area. The average density was 3.4 ± 2.3 (0–8 ind./9.6 km) – 0.35 ind./km. The average size of the social groups was 1.6 ± 0.9 (1–4 ind.; $n=42$) from the Maritsa River and 2.4 ± 0.99 (1–4 ind.; $n=12$) in the other three new localities in the ponds. An invasion of Coypu in the downstream of the Maritsa River is observed.

Key words: aquatic habitat, aquatic rodents, density, invasion species, nutria, size of social groups.

Introduction

The Coypu (*Myocastor coypus* (Molina, 1782)) is a large semi-aquatic rodent that lives along rivers, lakes, marshes, and other wetlands. Coypu is native in South America, but is tolerant to different aquatic habitats and has a high capability of dispersion and colonization (Carter and Leonard 2002, Bertolino et al. 2005). One of the reasons for the prevalence is the valuable fur and control of aquatic vegetation (Carter and Leonard 2002). It is included in the list of the 100 World's Worst Invasive Alien species (Bertolino 2009). Nutria is common in many countries in Europe, where it was also farmed. The species were introduced in the most European countries in the middle of last century (Aliev 1967, Velatta and Ragni

1991, Herrero and Couto 2002, Carter and Leonard 2002). During the period 1948–1968 Nutria is established outside in farms in Greece (Aliev 1967). Subsequently, there are numerous sights of the species in the wild in northern Greece (Mitchell-Jones et al. 1999). In the European part of Turkey it was established in 1994 (Özkan and Kurtonur 1994) and the distribution in the downstream of the Maritsa and the Tundzha Rivers increased until 1999 (Özkan 1999).

Coypu was introduced in Bulgaria in lake Mandrensko and Arkutino Natural Reserve, at the southern Black Sea Coast in 1953 (Peshev et al. 2004). Inland, it was reported only from the Maritsa River, near the city of Plovdiv (Popov and Sedefchev 2003), and from the river of Sazliyka, at the drainage basin of the Maritsa,

near Radnevo town (Myhajlov and Stoyanov 2001). A new locality was found in the downstream of the Maritsa River by Gruychev (2012). In 2015–2016, increasing of distribution of Coypu was reported in many parts of Bulgaria and downstream of the Maritsa River (Tsekova and Georgiev 2016).

The aims of this study are to present new information about the distribution of Nutria along the downstream of the Maritsa River (Natura 2000, BG 0000578), as well as the density and the size of the social groups in that area.

Materials and Methods

Study area

The researched area is localized in the south-eastern part of Bulgaria (Fig. 1). It covers the banks of the Maritsa River, between the towns of Simeonovgrad and Svilengrad. To the south, it touches the state border between Bulgaria and Turkey. The average annual temperatures are between 8 and 13.5 °C. The annual rainfall is between 500 and 800 mm, with

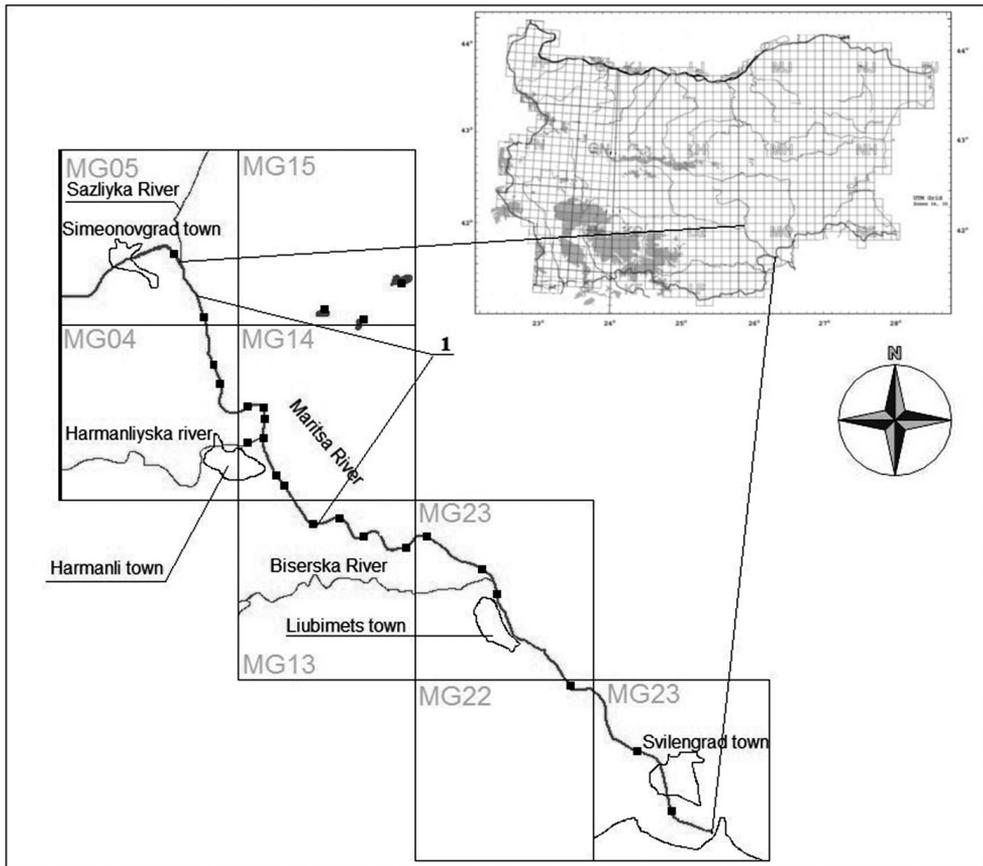


Fig. 1. Study area, new locality and distribution of Coypu (*Myocastor coypus*) in downstream of Maritsa River SE Bulgaria (1 – sample area, including transects to determine the density and size of social groups).

maximum winter and summer-autumn minimum. The snow cover lasts least compared to all other areas in Bulgaria. The average annual flow of the Maritsa River in Svilengrad is 110 m³/s (Kopravlev 2002). That study area is included in the protected zones of Natura 2000 (BG 0000578) by Directive 09/147/EEC on the protection of natural habitats.

Field methods

The distribution of Coypu in the research area was established by standard methods for aquatic mammals adapted for study area (Krebs 2004). The banks of the Maritsa River were observed during the period 2014–2016 between Svilengrad and Simeonovgrad. Searching implemented a walkthrough on the banks of the river. All data from monitored individuals, trails, footprints and burrows were used to determine the distribution of Coypu (Krebs 2004). To increase the success of detection, a dog was used (typical German wirehaired pointer).

A model section of the river banks was chosen to determine the density of Nutria (Fig. 1, 1). It contains transects with a total length of 9.6 km, including the two banks of the river. Each transect was at length of 500 m and 30 transects were randomly selected. Each transect was visited 12 times a year during the months of October till March 2014–2016. During the rest of the year, the vegetation is high and the coypu cannot be found because the visibility is reduced. Index of relative density was then given (number of individuals per km) (Krebs 2004, Marini et al. 2011). The sizes of the social groups are given with average \pm StDev. (min–max) individuals. Differences in density of Coypus over the years tested with Kruskal-Wallis test were observed.

Results

Twenty-four localities were found, twenty of them were in the researched section of the Maritsa River. Another three localities were in the ponds at a minimum distance of 6 km from the Maritsa River. One locality was found in the Harmanliyska River (Fig. 1).

The average density was 3.4 ± 2.3 (0–8 ind./9.6 km) – 0.35 ind./km. In 2014 it was 3.2 ± 1.9 (0–6 ind./9.6 km) – 0.3 ind./km; 2015 – 3.7 ± 2.3 (0–8 ind./9.6 km) – 0.4 ind./km; 2016 – 3.4 ± 2.7 (0–8 ind./9.6 km) – 0.3 ind./km. There are no significant differences in the density of Coypu during the researched period (Kruskal-Wallis chi-square = 0.37, $p=0.82$), as well as in the density in different months (Kruskal-Wallis chi-square = 3.1, $p=0.68$). The average size of the social groups was 1.6 ± 0.9 (1–4 ind.; $n=42$) of the Maritsa River and 2.4 ± 0.99 (1–4 ind.; $n=12$) in the three new localities in the ponds (Fig. 1). Most commonly single Coypus were seen.

Discussion

This study establishes the increase of localities and distribution of Coypu along the reaches of the Maritsa River. There were three new localities into the ponds. Perhaps they were a result of immigration from the Maritsa River. The Coypu inhabited ranges of 2–5 ha, exceptionally to 12 ha according to Jouventin (1996). Other studies reported home range of about 3–82 ha (Doncaster and Micol 1989). Usually Coypus does not depart at distance more than 200–400 m from water (exceptionally up to 1.25 km); they have small size territories (Adams 1956, Woods et al. 1992, Popov and Sedefchev 2003), but it can overcome a distance of the order of

40–50 km (Aliev 1965). We assume two ways of occupying the new territories of Coypu in the researched area: migration from locality near Simeonovgrad (Tsekova and Georgiev 2016) or the Sazlyka River (from the locality found by Myhajlov and Stoyanov 2001), and occupying new northern localities and migration from the south of the known localities, situated in the Republic of Turkey (Özkan and Kurtunur 1994, Özkan 1999).

The density of Coypu (0.35 ind./km) is lower than that one, shown in other similar studies – between 1.4 and 5.7 ind./100 m (Salsamendi et al. 2009, Marini et al. 2011); 1–8 ind./ha (Guiçhon and Cassini 2005) and 2.4–9.1 ind./ha (Doncaster and Micol 1989). The size of social groups is also considerably smaller than established in other regions (Guiçhon et al. 2003). This is probably due to the recently occupied habitat or the season in which the observation was done. Usually, the density of Coypus in autumn – winter seasons decreases due to high mortality of individuals in severe winters (Doncaster and Micol 1989, 1990, Velatta and Ragni 1991, Reggiani et al. 1995, Bertolino et al. 2005).

Conclusion

Early studies in the United States reported minor damage, as subsequently reported that Coypu can cause damage by destroying marsh habitats, destroyed dikes, destroyed crops and can be a reservoir of diseases (Howerth et al. 1994, Mouton et al. 2001, Carter and Leonard 2002). This study demonstrates an increase in the distribution of Coypu in Southeastern Bulgaria. The density of Coypus in the researched area is still too low to cause any damage, but such may occur in future.

Further studies are needed to determine the impact on aquatic habitats.

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