Trakia Journal of Sciences, No 1, pp 35-37, 2021

Available online at:
http://www.uni-sz.bg

ISSN 1313-3551 (online) **doi:10.15547/tjs.2021.01.006**

Original Contribution

ON THE "OTTER-FISH PRODUCERS CONFLICT" IN SOUTH-EASTERN BULGARIA

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ABSTRACT

Predatory mammals compete with humans for game, livestock and fish. The otter (*Lutra lutra* L.) inhabits the whole river system in Bulgaria, including fish ponds, coming into conflict with fish producers causing damage due to its feeding habits. To clarify the manifestations of the conflict, an anonymous questionnaire among fish farmers and workers was provided. According to the survey, the market-sized fish was affected the most (93.75% of the respondents) by otter's attacks, to a lesser extent the juveniles - 63.75% and the broodstocks - 62.5%, respectively. In the current study, 43.75% of respondents claimed that weed fish also suffers damage. A total of 77.5% of the respondents have tried to overcome the problem. In the present study, there was no report for using a non-lethal method. It can be concluded that the "Otter-fish producers conflict" in Bulgaria will be mitigated if compensations are provided for the economic losses.

Key words: *Lutra lutra*, fish ponds, damage, questionnaire

INTRODUCTION

Predatory mammals compete with humans for game, livestock and fish. The Eurasian otter (*Lutra lutra* L.) appears as one of these problematic species. Throughout its range it is now vulnerable (1) and protected species. It is included in Appendix II of the Bern Convention (2) as a strictly protected species. The otter is included in Appendix I of the Washington Convention, CITES (3).

Otter is the only piscivorous mammal in Bulgarian rivers. It is widely distributed, including along the Black sea coast, not found only in the north-eastern part of the country (4). The species inhabits the whole river system in Bulgaria, including fish ponds, coming into conflict with fish producers causing damage due to its feeding habits. To clarify the manifestations of the conflict, an anonymous questionnaire among fish farmers and workers was provided.

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MATERIAL AND METHODS

In order to reveal the attitude of the owners and workers in fish farms towards the otter, a questionnaire with the following questions was composed:

Questionnaire:

FISH PRODUCER'S ATTITUDE TO THE OTTER

1. Have you seen an otter before?
   Yes ○ No ○
2. Have you seen an otter in your fish farm?
   Yes ○ No ○
3. Do you think that the otter causes damage to the fish? Yes ○ No ○
4. Which fish categories are attacked most often by the otter:
- juveniles (50-200 g)
- market sized fish (1 500-2 500 g)
- mature fish (5 000 -11 000 g)
- weed fish
5. Have you been trying to protect your fish farm from an otter (if YES define in what way)? Yes ○ No ○
6. Do you consider that you should be compensated by the state for the damages caused by an otter in your fish farm?
   Yes ○ No ○

7. Do you think that the otter should be exterminated? Yes ○ No ○

The anonymous questionnaire was conducted between January 2014 and August 2014, among 80 owners and workers in fish ponds out of 115 registered fish farms in the region of Stara Zagora city, Yambol city, and Sliven city. The percentage values of positive and negative responses for each question were represented in a table.

RESULTS AND DISCUSSION

It is understandable that 6.25% of respondents have not seen an otter **(Table 1)**.

Table1. *Fish producers' opinion and attitude towards otter's presence in the South-Eastern Bulgaria*

Question	Positive answers		Negative answers	
	n	%	n	%
Have you seen an otter before?	75	93.75	5	6.20
Have you seen an otter on your fish farm?	65	81.25	15	23.75
Do you think that the otter causes damage to the fish?	80	100.00	-	-
Which fish categories are attacked most often by the otter:				
juveniles (50-200 g)	51	63.75		
market sized fish (1 500-2 500 g)	75	93.75		
mature fish (5 000 -11 000 g)	50	62.50		
weed fish	35	43.75		
Have you been trying to protect your fish farm from an otter (if YES define in what way)?	62	77.50	18	22.50
Do you consider that you should be compensated by the state for the damages caused by an otter in your fish farm?	80	100.00	-	-
Do you think that the otter should be exterminated?	26	32.50	54	67.50

Workers were hired for the process, thus the fish producers were not directly involved in it. Therefore, they did not visit the pond regularly or witness the otter's presence. Most importantly, however, is that the majority (81%) claimed their fish farm was visited by otters. The negative answers (19%) might have been obtained not because of otters' absence, but due to difficulties in detecting them. Thus, the author suggests the percentage of fish ponds with the presence of this predator is higher than indicated. There are plenty of supporting habitats in the studied area, facilitating the presence of otters in the river system and in fish farms (5). For comparison, in southern Poland, the otter was present in 91% of the studied water reservoirs.

All of the interviewed fish farmers affirmed damages by the otter in their ponds. According to the survey, the market-sized fish was affected the most (93.75% of the respondents), and to a lesser extent the juveniles - 63.75% and the broodstocks - 62.5%, respectively **(Table 1)**. In the Czech Republic, the otter attacks carp ranging in size from 1,049 g to 11,768 g, comprising carp for consumption and for breeding (6). In Hungary, a size of 500-1000 g is preferable for predating from this species (7), i.e. carp for fattening.

In the current survey, 43.75% of respondents claimed that weed fish also suffers damage. The crucian carps (*Carassius* spp.) and the common rudd (*Scardinius erythrophthalmus*) were pointed out the most. Since in Bulgaria the weed fish is a trade object, its predation from the otter brings losses for fish farmers as well.

A total of 77.5% of the respondents **(Table 1)** have tried to overcome the problem. The remaining 22.5% believed that the human presence is repulse enough for the otter and no additional efforts are needed. The pointed-out methods for dealing with otter attacks revealed in an additional conversation with each of the respondents, were mainly lethal: trapping; poisoning; killing with electricity and shooting. In accordance, (8) reported a high level of otters' mortality from poaching in the Upper Thracian plain (Bulgaria). The lethal methods are widely applied by fish producers in the Czech Republic (9). Only a few of the respondents believed that strong light or dogs' presence may reliably protect their production.

The extensive fishpond technologies are also recommended to be used for reducing conflicts between the otter and farmers (10).

In Bulgaria, fish farmers have no compensation for fish losses from piscivorous species, so resorting to extreme measures is more likely. In the present study, there was no report for the non-lethal methods using. In Poland, the use of non - destructive methods is rare (17% of respondents; 11).

"There must be compensations!" - That was the respondents' solid conviction. Compensations for otter damages are already paid in Austria (12), in Germany (13), as well as in Slovakia (14). In the Czech Republic, however, the small fish farmers prefer to deal with otters using lethal methods, rather than forwarding the required documentation for payments (9).

Due to the increasing ecological thinking of farmers in recent years and otter's conservation status, 67.5% of the respondents consider that the species should not be exterminated, despite the problems arising from its presence. It can be concluded that the "Otter-fish producers' conflict" in Bulgaria will be mitigated if compensations are provided for the economic losses.

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