

# DWA Set of Rules

## **Guideline DWA-M 608-1E**

**Muskrat, beaver, nutria – Part 1: Identification features and ways of life**

August 2017

**Bisam, Biber, Nutria – Teil 1: Erkennungsmerkmale und Lebensweisen**

August 2017

PREVIEW

PREVIEW

The German Association for Water, Wastewater and Waste (DWA) is strongly committed to the development of secure and sustainable water and waste management. As a politically and economically independent organisation it is professionally active in the field of water management, wastewater, waste and soil protection.

In Europe DWA is the association with the largest number of members within this field. Therefore it takes on a unique position in connection with professional competence regarding standardisation, professional training and information. The approximately 14,000 members represent specialists and executives from municipalities, universities, engineering offices, authorities and companies.

### Imprint

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### Translation:

DWA

### ISBN:

978-3-96862-543-0 (E-Book)

© Deutsche Vereinigung für Wasserwirtschaft, Abwasser und Abfall e.V. (DWA), 1st edition, Hennef, 2023  
German Association for Water, Wastewater and Waste

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## Foreword

The increasing spread of the muskrat and the damage caused by it prompted the German Association for Water Management and Cultural Engineering (DVWK) to draw up "Recommendations for muskrat-proof development of watercourses, dikes and dams" as early as 1975. (DVWK-Regeln zur Wasserwirtschaft, issue 107/1977; 2nd edition 1981).

After the muskrat had spread over the whole of Central Europe and, on the other hand, the demands on the water discharge and the water ecology had changed considerably in some areas, it was necessary to re-evaluate the avoidance and control strategies. The Working Group of the Federal States on Water Issues (LAWA) therefore commissioned the DVWK to carry out corresponding investigations and to record the results in a Guideline (see Guideline DVWK-M 247/1997 "Bisam, Biber, Nutria - Erkennungsmerkmale und Lebensweisen, Gestaltung und Sicherung gefährdeter Ufer, Deiche und Dämme").

In the meantime, the beaver, the largest native semi-aquatic mammal, can also be found again at numerous water bodies as a result of extensive protection measures and successful reintroduction projects. The beaver is a strictly protected species according to the Federal Nature Conservation Act (BNatSchG) in conjunction with Annex IV of the Habitats Directive (FFH-RL). At this point, special attention is drawn to the fact that sufficient habitats must be left for the native beaver or new ones must be created, while the muskrat must be stopped by means of suitable water shaping and protection measures or targeted control because of its often-numerous occurrence (e.g., in Lower Saxony in 2012 around 131,000 muskrats were caught) and the damage it often causes.

Furthermore, an increased occurrence of the nutria can be observed, partly caused by the dissolution of nutria farms in the former GDR, but also by immigration from the French area (Upper Rhine plain). In view of increasing complaints from land and water management since 1990, there is a demand in the Federal Republic of Germany not for population regulation but for a legal regulation for the management of all free-living nutria. There is an urgent need for legislative action on this issue. The damage situation primarily affects agriculture and water management, but also transport and local authorities as well as individual citizens as owners. A transfer of problem solving to the hunting associations, as by special regulations in some federal states, seems controversial. On the one hand, this places the burden of damage regulation on the hunting community, while on the other hand, their task is primarily the management and use of game, not pest control. Therefore, it seems reasonable to assign specially selected persons (full-time muskrat hunters) with special permits for nutria trapping.

Since all three rodent species can damage hydraulic engineering structures, in particular bank structures, dikes and dams, through their burrowing activities, the responsible DWA Technical Committee or DWA Working Group considered it appropriate to describe all three animal species in a Guideline and to provide information on the design and protection of banks, dikes and dams. Although important information on the distribution, behavior and ecological interference of free-living nutria populations is still missing, it was considered necessary to present the revised Guideline with the current state of knowledge in view of the urgent need for information on the part of those responsible for proper water drainage and flood and dike protection.

With the entry into force of the EC Water Framework Directive and the new Federal Water Act, those responsible for watercourse maintenance are obliged to achieve good ecological status or good ecological potential by 2027 at the latest. This mandatory task has already led to significantly increased renaturation efforts. In this context, the burrowing activities of the aforementioned animal species and their consequences are sometimes viewed from a different angle. This has led to the revision of the DVWK-M 247 Guideline to the DWA-M 608 Guideline in several parts. In the present part 1, the identification characteristics and lifestyles of muskrat, beaver and nutria are described. Further parts deal with information on the design and protection of banks, dikes and dams, damage and hazard potentials, population regulation as well as management issues and watercourse development. With the presentation of this Guideline, those responsible for the water bodies, the nature conservationists concerned with them, the riparians as those directly affected, but also all other interested parties are

to be provided with qualified specialist information on how to safely address these three animal species, their activity characteristics on the water and how to solve the problems they cause.

We would like to take this opportunity to thank all those involved for their intensive work in an objective and trusting atmosphere.

### **Changes**

Compared to the DVWK-M 247/1997 "Bisam, Biber, Nutria - Erkennungsmerkmale und Lebensweisen, Gestaltung und Sicherung gefährdeter Ufer, Deiche und Dämme" the following changes were made:

- a) Update of the Guideline;
- b) Division into several parts;
- c) Adaptation to the considerably changed legal requirements due to the entry into force of several EU directives and their implementation in national law;
- d) Extension to include aspects of watercourse development and biodiversity.

Hennef, July 2017

Georg Schrenk

### **Previous issues**

Guideline DVWK-M 247/1997 (in parts; Guideline DWA-M 608-1 replaces sections 1 to 4)

Standard DVWK-R 107/1981

Standard KWK-DVWW-R 107/1977

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## User Notes

This Guideline has been produced by a group of technical, scientific and economic experts, working in an honorary capacity and applying the rules and procedures of the DWA and the Standard DWA-A 400. Based on judicial precedent, there exists an actual presumption that this document is textually and technically correct.

Any party is free to make use of this Guideline. However, the application of its contents may also be made an obligation under the terms of legal or administrative regulations, or of a contract, or for some other legal reason.

This Guideline is an important, but not the sole, source of information for solutions to technical problems. Applying information given here does not relieve the user of responsibility for his own actions or for correctly applying this information in specific cases. This holds true in particular when it comes to respecting the margins laid down in this Guideline.

## Introduction

Man-made structures and landscape features provide certain animal species with favorable habitats where, among other things, they can escape disturbance, find shelter from adverse weather conditions, escape from enemies, raise young and find food. This also applies to dikes and dams, which can be heavily affected by the burrowing activities of some mammal species that their stability is threatened locally.

These animal species include not only the semi-aquatic, shore-dwelling mammal species, such as muskrat (*Ondatra zibethicus*), beaver (*Castor fiber*) and nutria (*Myocastor coypus*), but also terrestrial species such as mole (*Talpa europaea*), field mouse (*Microtus arvalis*), water vole (*Arvicola amphibius*), norway rat (*Rattus norvegicus*), wild rabbit (*Oryctolagus cuniculus*), fox (*Vulpes vulpes*) and badger (*Meles meles*). The latter terrestrial species are dealt with in more detail in DVWK-M 226/1993 "Landscape ecological aspects of river dikes" and in the second part of this information sheet, which is still being prepared.

The muskrat and the nutria, which have become more prevalent in recent years, have spread or are spreading extensively in streams and ditches where they are offered favorable living conditions.

The three rodent species muskrat, beaver and nutria often have a lasting and detrimental effect on the banks, dikes and dams through their way of life - mainly through burrowing, but also partly through searching for food (figures 1 to 4).

Consequential damages include:

- I Bank erosion and collapse,**  
 which lead to the impairment of the cultivation of an area, the use of a road or similar and thereby constitute a threat to public safety.
- I Slope slides**  
 on dikes and dams that endanger their stability and functionality,
- I Undercutting**  
 in bank and dike areas that permanently or adversely alter the flow function of a watercourse or its stability,
- I Obstructions**  
 in front of intake structures, weirs and spillways due to trees and branches, e.g. of turbine intake screens at river power plants,

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With the entry into force of the EC Water Framework Directive (Directive 2000/60/EC) and the new Federal Water Act, those responsible for watercourse maintenance are obliged to achieve good ecological status or good ecological potential by 2027 at the latest. This mandatory task has already led to significantly increased renaturation efforts. In this context, the burrowing activities of muskrat, beaver and nutria and their consequences are sometimes viewed from a different angle. This has led to the revision of the DVWK-M 247 from 1997 to the Guideline DWA-M 608 consisting of multiple parts.

Concrete measures for the design and maintenance of water bodies or of dikes and embankments in accordance with the respective requirements can only be determined for practice if sufficient knowledge about the recognition characteristics and lifestyles of these three rodent species is available, and the appropriate identification of the burrowing animals can take place. For this purpose, the data, knowledge and experience known to date, supplemented by own investigations, were compiled and evaluated.

In Guideline DWA-M 608-1 the identification characteristics and lifestyles of muskrat, beaver and nutria are described in detail. To avoid confusion, the identification of otter, mink, Norway rat and water vole are also briefly characterised. This provides those responsible for the water bodies, the nature conservationists involved, the riparians as those directly affected, but also all other interested parties, with qualified specialist information on how to safely approach these animal species and their activity characteristics near water bodies.

Additional parts of the Guideline will deal with advice on the design and protection of banks, dikes and dams, damage and hazard potentials, stock regulation as well as management issues, creation of new habitats and improvement of biodiversity as well as watercourse development.

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ISBN: 978-3-96862-543-0 [E-Book]

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