

Ondatra zibethicus



Taxon	Family / Order / Class / Phylum
<i>Ondatra zibethicus</i> , Linnaeus 1766	Muridae / Rodentia / Mammalia / Chordata

COMMON NAMES (English only)

Muskrat

SYNONYMS

Ondatra americana
Castor zibethicus
Fiber zibethicus
Myocastor zibethicus
Mus zibethicus

SHORT DESCRIPTION

Large (410-620 mm; weight 680-1800 g), stocky aquatic rodent with large head, small eyes, very short rounded ears. Dark brown, with underside slightly paler in colour. Tail as long as the head and body (180-295 mm), hairless and flattened laterally. Common name refers to the musky odour. They eat almost any aquatic vegetation as well as crops. Also feed on crayfish, mussels, turtles, frogs and fish in ponds where vegetation is scarce.



Ondatra zibethicus is a large aquatic rodent introduced in Europe from North America

Photo: Veli-Matti Väänänen (University of Helsinki)

BIOLOGY/ECOLOGY

Dispersal mechanisms

Young usually disperse after their first winter, when they are less than 1 year old. They have good dispersal ability along streams and water bodies. The average expansion speed in central Europe in the first half of last century was around 11.3 km per year, but high variance has been found at different latitudes, in some cases exceeding 20 km/yr.

Reproduction

They have on average two or three litters per year (up to 5-6 in favourable climatic and habitat conditions) after a gestation period of 25-30 days. Able to swim by 2 weeks of age, weaned at 3-4 weeks when they begin to feed independently. Young become sexually mature the spring following birth.

Known predators/herbivores

American mink (*Mustela vison*) and European mink (*M. lutreola*) kill muskrats to feed on them and also to take over their burrows. Otters (*Lutra lutra*), barn owls (*Tyto alba*) and harriers (*Circus* spp) also prey on muskrats. However, in general predation does not regulate muskrat populations.

Resistant stages (seeds, spores etc.)

HABITAT

Native (EUNIS code)

C: Inland surface water habitats, D: Mire, bog and fen habitats, F9: Riverine and fen scrubs

Habitat occupied in invaded range (EUNIS code)

C: Inland surface water habitats, D: Mire, bog and fen habitats, F9: Riverine and fen scrubs

Habitat requirements

Live in both brackish and freshwater lakes, ponds, streams, rivers and marshes. They are well adapted to cold climates. However, they show higher reproductive rates in southern latitudes. Tidal fluctuations, periodic flooding or droughts limit species distribution. Dry summers and severe winters have detrimental effects.

DISTRIBUTION

Native Range

Broadly distributed all over North America except extreme northern parts.

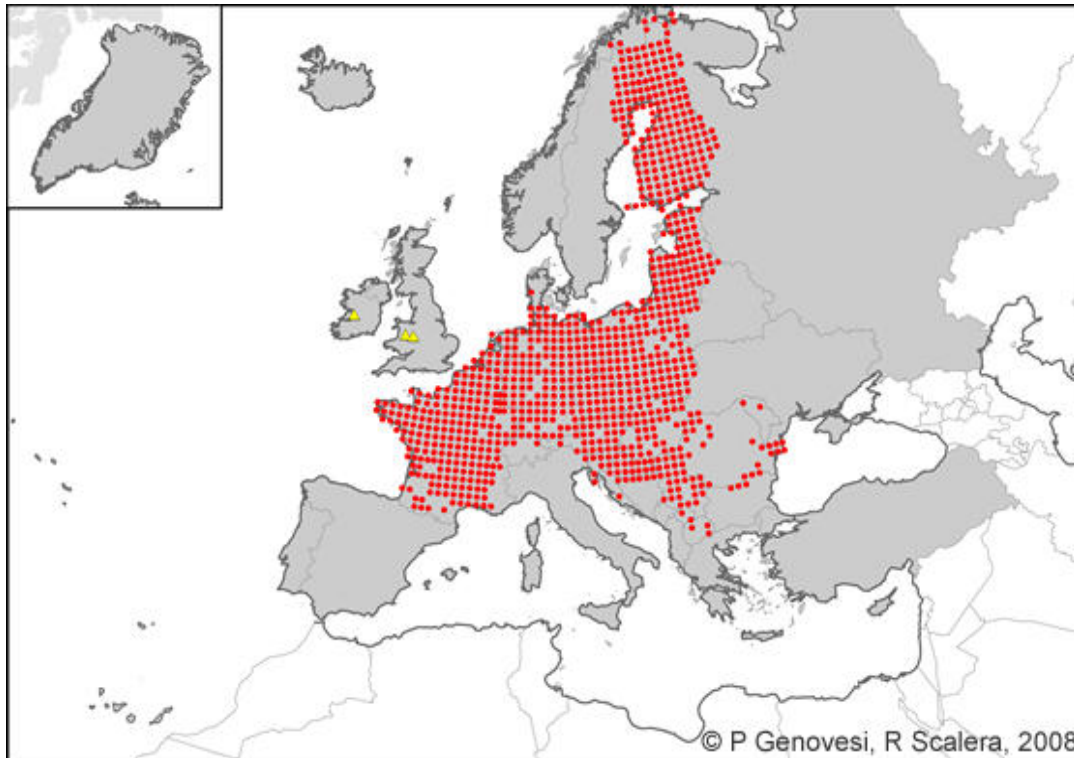
Known Introduced Range

Successfully introduced into most of the Palearctic, including Great Britain, northern and central Europe, Ukraine, Russia, parts of China and Mongolia, and Honshu Island in Japan. Also introduced in South America (Argentina and Chile). Successfully eradicated from Britain and Ireland in the thirties.







Trend

Abundant in northern and central Europe, it is increasing and expanding in many countries. Still absent or localized in most southern European countries.

MAP (European distribution)



Legend

	Known in country		Known in CGRS square		Known in sea
	Eradicated		Eradicated		Extinct

INTRODUCTION PATHWAY

Imported for fur farming in many countries, it has escaped into the wild or has been intentionally released with the aim of establishing populations to be harvested for their furs.

IMPACT

Ecosystem Impact

Strongly affects vegetation dynamics through grazing. Threatens endemic species such as the desman (*Desmana moschata*). It also impacts shellfishes, fishes and ground nesting birds; endangered mussel populations are particularly impacted.

Health and Social Impact

In some areas they carry *Leptospira*, which causes Weil's disease in humans. It serves as an intermediate host for the cestode, *Echinococcus multilocularis* (infection rates up to 28% in wild populations). Burrowing can weaken riverbanks causing them to collapse. Can damage railroads and dams.

Economic Impact

Cause extensive damage to crops, irrigation structures, railroads and dams. In some cases undermine fences or cause bogging of machinery. It has also a potential impact on aquaculture industry. In Germany it is estimated at € 12,4 mln/yr (€ 4.6 mln/yr for sanitary aspects, € 3 mln/yr for maintenance of waterways, € 1.9 mlr/yr for

impacts to hatcheries and fish breeders by damaging ponds and dams. Cost of eradication efforts in Germany estimated at over € 3 mln/yr.

MANAGEMENT

Prevention

Fencing is effective at preventing damage to valuable crops or gardens. Damage to pond dams can be prevented through stone rip-rapping of dams, or by constructing dams with proper slope and size. Also drawing of ponds in winter is used to remove muskrats. Frightening devices are seldom effective.

Mechanical

Control usually by trapping, less frequently by shooting. Most effective capturing devices are stove-pipe traps and Conibear®-type traps (not allowed in Europe under the Council Regulation 3254/91). Control usually through live traps. Also snares and iron bow-nets placed in front of entrances of holes are used.

Chemical

Zinc phosphide (63% concentrate) and anticoagulants are used to control muskrats. However, undesired impacts of toxicants on non-target species have been reported. Poison baits are usually placed on floating platforms to minimize risks to non-target species.

Biological

None.

REFERENCES

- Danell K (1978) Population Dynamics of the Muskrat in a Shallow Swedish Lake. *J Animal Ecology*, 47(3):697-709
- Nummi P, Väänänen VM, Malinen J (2006) Alien Grazing: Indirect Effects of Muskrats on Invertebrates. *Biological Invasions*, 8(5):993-999
- Wilson D, Ruff S (1999) *The Smithsonian Book of North American Mammals*. Washington, Smithsonian Institution Press

OTHER REFERENCES

- Fournier-Chambrillon C, Berny P, Coiffier O, Barbedienne P, Dasse B, Delas G, Galineau H, Mazet A, Bonzenc P, Rosoux R, Fournier P (2004) Field evidence of secondary poisoning of free-ranging riparian mustelids by anticoagulant rodenticides in France : implications for the conservation of the european mink (*Mustela lutreola*). *J Wildl Dis* 40:688-695
- Gosling LM, Baker SJ (1989) The eradication of the muskrats and coypus from Britain. *Botanical Journal of the Linnean Society* 38:39-51
- Haydon DT, Stenseth NC, Boyce MS, Greenwood PE (2001) Phase coupling and synchrony in the spatiotemporal dynamics of muskrat and mink populations across Canada *Proc.Natl. Acad. Sci. USA* 98: 13149–13154
- Miller JE (1972) Muskrat and beaver control. *Proc. First Nat. Ext. Wildl. Workshop*, Estes Park, Colorado, pp 35-37
- Miller JE (1974) Muskrat control and damage prevention. *Proc. Vertebr. Pest Conf.* 6:85-90
- Orueta JF (2003) Manual práctico para el manejo de vertebrados invasores en islas de España y Portugal. Gobierno de las Islas Baleares y Gobierno de Canarias, p 254
http://www.iucn.org/places/medoffice/invasive_species/docs/manual_practico.pdf
- Sheail J (1988) The extermination of the muskrat (*Ondatra zibethicus*) in inter-war Britain. *Archives of Natural History* 15:155-170
- Tuytens FAM, Stuyck JJM (2002) Effectiveness and efficiency of chlorophacinone poisoning for the control of muskrat (*Ondathra zibethicus*) populations. *New Zealand Journal of Zoology* 29:33–40
- van den Bosch F, Hengeveld R, Metz JAJ (1992) Analysing the Velocity of Animal Range Expansion *Journal of Biogeography* 19(2):135-150
- Warwick T (1940) A contribution to the ecology of the musk-rat (*Ondatra zibethica*) in the British Isles. *Proceedings of the Zoological Society of London, Series A*, 110:165-201

Author: Piero Genovesi

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