

NAME OF SPECIES: <i>Rattus norvegicus</i>	
Synonyms: " <i>Epimys norvegicus</i> Miller, 1912, <i>Mus decumanus</i> Pallas, 1778, <i>Mus hibernicus</i> Thompson, 1837, <i>Mus norvegicus</i> Berkenhout, 1769" (9)	
Common Name: Norway rat, brown rat, sewer rat, common rat	
A. CURRENT STATUS AND DISTRIBUTION	
I. In Wisconsin?	1. YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
	2. <u>Abundance</u> : The Norway rat is commonly found throughout Wisconsin
	3. <u>Geographic Range</u> : The Norway rat is commonly found around cities (1 and 3). This species can be found in a variety of habitats but usually around human habitation, such as garbage dumps, sewers, open basements, urban areas, abandoned buildings/structures and other areas with poor sanitary conditions. Known as a human commensal.
	4. <u>Habitat Invaded</u> : Human altered environments Disturbed Areas <input checked="" type="checkbox"/> Undisturbed Areas <input type="checkbox"/>
	5. <u>Historical Status and Rate of Spread in Wisconsin</u> : This species came to the North America around 1770 as a stowaway on a ship (1). Eventually spreading throughout the world with the help of ships. Unknown when it first arrived in WI, but Lapham mentioned the species around Racine in 1853
	6. <u>Proportion of potential range occupied</u> : This species will stay around humans at all times during the year.
	7. <u>Survival and Reproduction</u> : This species survives and reproduces throughout Wisconsin.
II. Invasive in Similar Climate Zones	1. YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> <u>Where (include trends)</u> : Throughout the world near people. This species will keep spreading as people spread (5).
III. Invasive in Similar Habitat Types	1. Upland <input type="checkbox"/> Wetland <input type="checkbox"/> Dune <input type="checkbox"/> Prairie <input type="checkbox"/> Aquatic <input type="checkbox"/> Forest <input type="checkbox"/> Grassland <input type="checkbox"/> Bog <input type="checkbox"/> Fen <input type="checkbox"/> Swamp <input type="checkbox"/> Marsh <input type="checkbox"/> Lake <input type="checkbox"/> Stream <input type="checkbox"/> Other: x. The Norway rat is commonly found around cities (1 and 3). This species can be found in a variety of habitats but usually around human habitation, such as garbage dumps, sewers, open basements, and pretty much everywhere humans live.
IV. Habitat Affected	1. <u>Where does this invasive reside</u> : Edge species <input checked="" type="checkbox"/> Interior species <input type="checkbox"/>
	2. <u>Conservation significance of threatened habitats</u> : None
V. Native Habitat	1. <u>List countries and native habitat types</u> : This species is native to forests and brushy areas of Asia, not Norway, as its name implies (1, 3 and 4).
VI. Legal Classification	1. <u>Listed by government entities?</u> No
	2. <u>Illegal to sell?</u> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Notes: Important for pet trade. Norway Rats can be considered as pets as well as food for pets (1). Also bred and sold widely as a laboratory research animal.

B. ESTABLISHMENT POTENTIAL AND LIFE HISTORY TRAITS	
I. Life History	1. <u>Type of Animal</u> : Mammal X Bird <input type="checkbox"/> Reptile <input type="checkbox"/> Amphibian <input type="checkbox"/> Fish <input type="checkbox"/>
	2. <u>Age of Maturity or time to self sufficiency</u> : The Norway rat becomes self sufficient at the age of 4-5 weeks and sexually matures at 3-4 months (1)
	3. <u>Gestation Period</u> : Gestation takes 22-24 days (1). Another estimate gestation 21-26 days (4).
	4. <u>Mating System</u> : Polygamous X Polyandrous <input type="checkbox"/> Monogamous <input type="checkbox"/> <u>Notes</u> : Dominant male guards female harem and aggressively prevents other males from mating.
	5. <u>Breeding/ Breeding period</u> : Breeding occurs year around, more often in the summer (1). The females have an average of 8 pups a litter, but litters ranges from 2-14 pups (1). Another estimate ranges from 2-22 pups (4). The average number of litters/year is about 5 but can go as high as 12 (4). This species will average around 60 pups a year (1). This species also exhibits something close to cooperative breeding (1). Numerous litters can be raised in one nest, many different mothers helping care for the young (1).
	6. <u>Hybridization potential</u> : None
II. Climate	1. <u>Climate restrictions</u> : None. Occur worldwide in all sorts of climates.
	2. <u>Effects of potential climate change</u> : This species has high reproductive rates and can live near humans. Climate change should not affect Norway rats.
III. Dispersal Potential	1. <u>Pathways - Please check all that apply</u> :  <u>Unintentional</u> : Bird <input type="checkbox"/> Animal <input type="checkbox"/> Vehicles/Human X. This species was brought to new areas as a stowaway (1). Wind <input type="checkbox"/> Water <input type="checkbox"/> Other:  <u>Intentional</u> : Ornamental <input type="checkbox"/> Forage/Erosion control <input type="checkbox"/> Medicine/Food: Recreational <input type="checkbox"/> Other: X Release into the wild.
	2. <u>Distinguishing characteristics that aid in its survival and/or inhibit its control</u> : High reproductive rates.
IV. Ability to go Undetected	1. HIGH <input type="checkbox"/> MEDIUM <input type="checkbox"/> LOW X Presence of rats is easily detected.
C. DAMAGE POTENTIAL	
I. Competitive Ability	1. <u>Presence of Natural Enemies</u> : Norway rats have many enemies, including Canids, Felids, snakes, and birds of prey (1).
	2. <u>Competition with native species</u> : This species is an excellent competitor and will readily drive out other rat species (1). This species has contributed to the extinction and reduction of many mammals, birds, reptiles and invertebrates species through competition and predation (5). This species rapidly diminished ground nesting seabird populations on Langara Island, British

	<p>Columbia and out competed smaller roof rats (6). Norway rats have made impacts on native insects and plants in Hawaii (7).</p> <p>2. Rate of Spread:          -changes in relative dominance over time:          -change in acreage over time:          HIGH(1-3 yrs) X    MEDIUM (4-6 yrs) <input type="checkbox"/>    LOW (7-10 yrs) <input type="checkbox"/></p> <p>Notes:</p>
II. Environmental Effects	<p>1. <u>Alteration of ecosystem/community composition?</u>          YES X    NO <input type="checkbox"/>          Notes: Norway rats can act as seed dispersers and arreate soil (1). One Study in Hawaii stated that Norway rats eat native seeds and plants, and this has led to decreased populations of these plants (7). Norway rats restrict regeneration of many native plants because they eat seeds and graze on seedlings (9).</p> <p>2. <u>Alteration of ecosystem/community structure?</u>          YES X    NO <input type="checkbox"/>          Notes: Same as #1 above.</p> <p>3. <u>Alteration of ecosystem/community functions and processes?</u>          YES X    NO <input type="checkbox"/>          Notes: Same as #1 above.</p> <p>4. <u>Exhibit Parasitism?</u>    YES <input type="checkbox"/>    NO X          Notes:</p>
<b>D. SOCIO-ECONOMIC EFFECTS</b>	
I. Positive aspects of the species to the economy/society:	Notes: This speceis is important for the pet trade, provides educational values, and as a medical and research animal has contributed to important discoveries in immunology, genetics, physiology, and epidemiology (1).
II. Potential Socio-Economic Effects of Requiring Controls: Positive: Negative:	Notes: There is no negative effect in controlling this animal.  This species causes many problems for people and carries many diseases (1,2, 3, 8 and 9). Controlling this species will help stop these problems. Pest control industry would benefit from increased business from control requirements.
III. Direct and indirect Socio-Economic Effects of the animal :	Notes: Norway rats carry numerous diseases (1). Norway rats consume large amounts of food stored for humans and their livestock, and contaminate more than they eat. They kill poultry, livestock, and gamebirds (2,8, and 9). This species will gnaw insulation from wires, sometimes causing fires, and chew on building sturcures (2 and 8).
IV. Increased Costs to Sectors Caused by the Animal:	Notes: Health, farming, and building sectors
V. Effects on human health:	Notes: About 40 diseases are spread by rats (10). Norway rats directly attack about 14,000 people/year in the U.S. (11).
VI. Potential socio-economic effects of restricting use:	Positive: This species causes many problems for people and carries many diseases (1,2, 3, 8 and 9). Restricting use of this species will help stop these problems. Negative: No negative effects to restricting use.
<b>E. CONTROL AND PREVENTION</b>	
I. Costs of Prevention (please be	Notes: \$75/hectare for a chemical to remove the Norway rat (9).

as specific as possible):	
II. Responsiveness to prevention efforts:	Notes: Norway rats may exhibit “neophobia” - avoiding any new object or changed situation in environments (6, 8). Anticoagulants are one of the most effective ways to eliminate these animals (6, 8). Anticoagulants are slow acting and Norway rats will not associate their illness with the bait.
III. Effective Control tactics:	Mechanical X Biological <input type="checkbox"/> Chemical X Times and uses:
IV. Minimum Effort:	Notes: Chemical control requires minimal effort. Trapping, which is also effective, requires traps to be checked at least daily or more often.
V. Costs of Control:	Notes: \$75/hectare for a chemical to remove the Norway rat (9).
VI. Cost of prevention or control vs. Cost of allowing invasion to occur:	Notes: In areas where these rats are a big problem it is worth the expense, but in other areas \$75/hectare can be expensive, and there is no guarantee that all rats will be eliminated. Rats can recolonize vacant areas.
VII. Non-Target Effects of Control:	Notes: There may be problems with “primary poisoning” (6). Primary poisoning refers to other animals consuming the poison (6). There is also worry of secondary poisoning, when an animal consumes a dead rat that ingested the poison (6).
VIII. Efficacy of monitoring:	Notes: Look for scat, urine, tracks, and gnawing. If one finds fresh scat this means that there is a lot of rats, if old scat is found than there is a medium infestation of rats and if one finds no sign than there maybe no or very few rats (8).
IX. Legal and landowner issues:	Notes: None.

## F. REFERENCES :

Number	Reference
1	Myers, P. and D. Armitage. 2004. "Rattus norvegicus" (On-line), Animal Diversity Web. Accessed July 31, 2007 at <a href="http://animaldiversity.ummz.umich.edu/site/accounts/information/Rattus_norvegicus.html">http://animaldiversity.ummz.umich.edu/site/accounts/information/Rattus_norvegicus.html</a> .
2	<a href="http://icwdm.org/wildlife/norwayrat.asp">http://icwdm.org/wildlife/norwayrat.asp</a>
3	<a href="http://www.bbc.co.uk/nature/wildfacts/factfiles/273.shtml">http://www.bbc.co.uk/nature/wildfacts/factfiles/273.shtml</a>
4	<a href="http://www.enature.com/fieldguides/detail.asp?recnum=MA0095">http://www.enature.com/fieldguides/detail.asp?recnum=MA0095</a>
5	<a href="http://www.columbia.edu/itc/cerc/danoff-burg/invasion_bio/inv_spp_summ/Rattus_norvegicus.html">http://www.columbia.edu/itc/cerc/danoff-burg/invasion_bio/inv_spp_summ/Rattus_norvegicus.html</a>
6	<a href="http://horticulture.coafes.umn.edu/vd/h5015/00papers/tompkins.htm">http://horticulture.coafes.umn.edu/vd/h5015/00papers/tompkins.htm</a>
7	<a href="http://www.earlham.edu/~biol/hawaii/mammals.htm">http://www.earlham.edu/~biol/hawaii/mammals.htm</a>
8	<a href="http://icwdm.org/handbook/rodents/NorwayRats.asp">http://icwdm.org/handbook/rodents/NorwayRats.asp</a>
9	<a href="http://www.issg.org/database/species/ecology.asp?si=159&amp;fr=1&amp;sts=sss">http://www.issg.org/database/species/ecology.asp?si=159&amp;fr=1&amp;sts=sss</a>
10	Gratz, N.G. 1984. The global public health importance of rodents. In Dubock, A.C., ed., Proceedings of a conference on the organization (sic) and practice of vertebrate pest control. World Health Organization, Geneva, 413-35.
11	Pratt, H.D., B.F. Bjornson, and K.S. Littig. 1977 Control of domestic rats and mice. U.S. Publ. Health Service., Center for Disease Control, Atlanta, 47 pp.

**Author(s), Draft number, and date completed:** Bill Frederickson, 31-Jul-07

**Reviewer(s) and date reviewed:** Dave Matheys, 8/7/07

**Approved and Completed Date:**