

ATTACHMENT SS2

REGION 2 SENSITIVE SPECIES EVALUATION FORM

Species: <i>Microtus richardsoni</i> - undescribed taxon / Water vole - Big Horn Mountain population			
Criteria	Rank	Rationale	Literature Citations
<p>1 Distribution within R2</p>	<p>A</p>	<p>At the species level, <i>M. richardsoni</i> occurs on 2 National Forest units in the Rocky Mountain Region: Bighorn NF and Shoshone NF. However, this population is likely restricted to just the former unit. This geographic isolation may have resulted in genetic divergence of this population.</p> <p>Confidence in Rank Medium</p>	<p>Beauvais, G. P. 2000. Mammalian responses to forest fragmentation in the Central and Southern Rocky Mountains. Pages 179-201 in R. L. Knight, F. W. Smith, S. W. Buskirk, W. H. Romme, and W. L. Baker. Forest fragmentation in the Southern Rocky Mountains. University of Colorado Press, Boulder, Colorado.</p> <p>Clark, T. W. and M. R. Stromberg. 1987. Mammals in Wyoming. University Press of Kansas. Lawrence, Kansas.</p> <p>Hall, E. R. 1981. The mammals of North America. Second edition. John Wiley and Sons, New York, New York.</p> <p>M. Klaus, personal communication. Sheridan College, Sheridan, Wyoming.</p>
<p>2 Distribution outside R2</p>	<p>A</p>	<p>Although <i>M. richardsoni</i> ranges across northwestern North America, this population is isolated to the Big Horn Mountains in north central Wyoming. It occurs on just one National Forest unit in the Rocky Mountain region, the Bighorn National Forest.</p> <p>Confidence in Rank Medium</p>	<p>(see citations for criteria 1)</p>

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<p>3 Dispersal Capability</p>	A	<p>Dispersal activity and distances are not well known, but dispersal is likely restricted completely to stream networks. Coupled with the small, widespread, and patchy nature of populations, this restricted dispersal capability raises the probability of local extinction.</p> <p>Confidence in Rank Medium</p>	<p>Klaus, M., R. E. Moore, E. Vyse. 1999. Impact of precipitation and grazing on the water vole in the Beartooth Mountains of Montana and Wyoming, U.S.A. Arctic, Antarctic, and Alpine Research 31:278-282.</p> <p>Ludwig, D.R. 1981. The population biology and life history of the water vole, <i>Microtus richardsoni</i>. Ph.D dissertation, University of Calgary, Alberta, Canada.</p> <p>M. Klaus, personal communication. Sheridan College, Sheridan, Wyoming.</p>
<p>4 Abundance in R2</p>	A	<p>In general, <i>M. richardsoni</i> forms much smaller populations compared to other microtines. Recent research (M. Klaus) on the Big Horn Mountains has documented extremely low densities, very small and widespread local populations, and frequent local extinctions. The Bighorn National Forest supports the majority of individuals in this population.</p> <p>Confidence in Rank High</p>	<p>Ludwig, D.R. 1981. The population biology and life history of the water vole, <i>Microtus richardsoni</i>. Ph.D dissertation, University of Calgary, Alberta, Canada.</p> <p>M. Klaus, personal communication. Sheridan College, Sheridan, Wyoming.</p>
<p>5 Population Trend in R2</p>	A	<p>Clark and Stromberg (1987) noted a general statewide decline since about 1960. Recent research (M. Klaus) on the Big Horn Mountains has documented extremely low densities, very small and widespread local populations, and frequent local extinctions. Because it is doubtful that this situation could persist for long without extinction, it is likely that historical abundances and distribution were greater.</p> <p>Confidence in Rank Low</p>	<p>Clark, T. W. and M. R. Stromberg. 1987. Mammals in Wyoming. University Press of Kansas. Lawrence, Kansas.</p> <p>M. Klaus, personal communication. Sheridan College, Sheridan, Wyoming.</p>

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<p>6 Habitat Trend in R2</p>	<p>A</p>	<p>Several researchers implicate domestic livestock grazing in montane riparian meadows as a major factor that has degraded <i>M. richardsoni</i> habitat in Wyoming in general, and the Big Horn Mountains in particular. In some cases, timber harvesting and road building have likely also degraded habitat. The Bighorn National Forest supports the majority of habitat, and the highest quality habitat, for this population.</p> <p>Confidence in Rank Medium</p>	<p>Clark, T. W. and M. R. Stromberg. 1987. Mammals in Wyoming. University Press of Kansas. Lawrence, Kansas.</p> <p>Bighorn National Forest. 1996. Endangered and Sensitive animal species of the Bighorn National Forest. Unpublished draft report on file at Bighorn NF Supervisor's Office, Sheridan, Wyoming.</p> <p>Oakleaf, B, A. Cerovski, and B. Luce. 1996. Nongame bird and mammal plan. Wyoming Game and Fish Department - Nongame Program. Lander, Wyoming.</p> <p>M. Klaus, personal communication. Sheridan College, Sheridan, Wyoming.</p>
<p>7 Habitat Vulnerability or Modification</p>	<p>A</p>	<p>Domestic livestock grazing in montane riparian meadows is a persistent threat. Timber harvesting and road building that impact montane riparian meadows, either directly through vegetation disturbance or indirectly through increased siltation, may be significant in some areas. Some habitat is protected in the Cloud Peak Wilderness Area, but likely not enough to ensure population persistence.</p> <p>Confidence in Rank Medium</p>	<p>(see citations for criteria 6)</p>

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8 Life History and Demographics	A	<p>Populations here and elsewhere are known to undergo dramatic annual and seasonal fluctuations, and reproductive output is relatively low for a rodent of this size. In combination with the fact that local population segments are small, restricted to infrequent patches of suitable habitat, and connected via infrequent dispersal only along stream networks, this predisposes the taxon to local extinction. Ludwig (1981) suggested that the above factors may also restrict gene flow, which would reinforce extinction probability.</p> <p>Confidence in Rank High</p>	<p>Bighorn National Forest. 1996. Endangered and Sensitive animal species of the Bighorn National Forest. Unpublished draft report on file at Bighorn NF Supervisor's Office, Sheridan, Wyoming.</p> <p>Ludwig, D.R. 1981. The population biology and life history of the water vole, <i>Microtus richardsoni</i>. Ph.D dissertation, University of Calgary, Alberta, Canada.</p> <p>Ludwig, D. R. 1988. Reproduction and population dynamics of the water vole, <i>Microtus richardsoni</i>. Journal of Mammalogy 69:532-541.</p> <p>M. Klaus, personal communication. Sheridan College, Sheridan, Wyoming.</p>
Initial Evaluator(s): Dr. Gary P. Beauvais, Director, Wyoming Natural Diversity Database - University of Wyoming.			Date: 29 May 2001

National Forests in the Rocky Mountain Region where species is KNOWN (K) or LIKELY(L)¹ to occur:

¹ Likely is defined as more likely to occur than not occur on the National Forest or Grassland. This generally can be thought of as having a 50% chance or greater of appearing on NFS lands.

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<u>Colorado NF/NG</u>		<u>Kansas NF/NG</u>		<u>Nebraska NF/NG</u>		<u>South Dakota NF/NG</u>		<u>Wyoming NF/NG</u>	
Known	Likely	Known	Likely	Known	Likely	Known	Likely	Known	Likely
		Cimmaron NG		Samuel R. McKelvie NF		Black Hills NF		Shoshone NF	
				Halsey NF		Buffalo Gap NG		Bighorn NF	X
				Nebraska NF		Ft. Pierre NG		Black Hills NF	
				Ogalala NG				Medicine Bow NF	
								Thunder Basin NG	