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# RANGE MAPS FOR WYOMING'S SPECIES OF GREATEST CONSERVATION NEED

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## INTRODUCTION

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In their Comprehensive Wildlife Conservation Strategy (WGFD 2005), the Wyoming Game and Fish Department (WGFD) identified 152 terrestrial vertebrate Species of Greatest Conservation Need (SGCN). These species were selected based on a combination of status and trends of the species' populations and key habitats, with the guiding principle that the collection of species was indicative of the diversity and health of Wyoming's wildlife. Many of these species were included on this list partly due to lack of knowledge regarding their status, distribution and habitats; i.e., their inclusion was partly "precautionary," in that their situations *might* warrant conservation attention (Table 1).

The CWCS (now called the State Wildlife Action Plan, or SWAP), is being revised in 2010. A major goal of this revision is to compile updated information on the range and distribution of SGCN within Wyoming. To this end, the Wyoming Natural Diversity Database (WYNDD) established a collaborative effort with the WGFD to refine estimates of range and distribution for these species. The general procedure for creating these maps was established at a collaborators meeting on May 30, 2009. This method involves first

delineating ranges based on hydrologic units (as summarized below), and then creating occurrence-based distribution models to estimate habitats suitable for occupation within these range boundaries.

This summary report and the accompanying geodatabase represent the completion of the range-mapping process. A full list of species mapped is provided in the Appendix to this report. The creation and expression of the range maps are summarized below.

**Table 1:** Taxonomic Summary of Wyoming’s Species of Greatest Conservation Need (SGCN), as identified by the Wyoming Game and Fish Department in 2005. “Info Lacking” refers to SGCN identified in part because of a paucity of information on range, status, and/ or trends.

<i><b>Taxonomic Group</b></i>	<i><b>SGCN</b></i>	<i><b>Info. Lacking</b></i>
<b>Mammals</b>	54	52
<b>Birds</b>	60	23
<b>Reptiles</b>	26	25
<b>Amphibians</b>	12	11
<b>Total</b>	152	111

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## RANGE MAPPING DETAILS

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Range is defined as the total areal extent occupied by a given taxon. Range is usually estimated as the aggregation of all map units thought to be occupied by individuals of the target taxon in the study area. Map units are typically defined by geographic space only (e.g., states, counties, watersheds, townships, GAP hexagons), with little consideration of underlying environmental variation. Because map units are usually coarse and simply-shaped, range maps are usually characterized by large all-encompassing polygons with very little interdigitation of occupied and unoccupied space.

In contrast, distribution is a spatial subset of range, and *the range maps presented herein are not meant to represent species’ distributions within Wyoming*. The distribution of a species refers to the fine-scale environments within its range that are suitable for occupation. Species’ distributions will be estimated in a subsequent process using statistical modeling of species occurrences as a function of environmental gradients.

The starting point for creating this set of Wyoming range maps was the set of North American range maps compiled by NatureServe (<http://www.natureserve.org/getData/animalData.jsp>). These “starter” maps were

essentially hand-drawn polygons representing, for each species, a general spatial consensus of published continental-scale range maps (example sources include the Birds of North America series, Mammalian Species accounts, and various popular field guides).

The first step in modifying the starter maps was to tessellate them to a standard map unit. The map units used to delineate SGCN ranges in Wyoming were high-resolution, 10-digit watershed (HUC) boundaries from the National Hydrography Dataset (Simley and Carswell 2009). Draft Wyoming range maps were created by re-sampling NatureServe maps to HUCs to produce a file geodatabase Feature Class for each species, in which each HUC has three attributes: Occupancy, Origin, and Season (further defined below).

Draft range maps were then reviewed and modified as needed by WYNDD zoologists to accommodate local knowledge and known occurrences maintained in WYNDD's Biotics database and WGFD's Wildlife Observation System (WOS). A series of meetings was then convened to allow state and regional experts to provide detailed comments and modifications to the range maps. Reptile and amphibian meetings were held May 26 - 27, 2009, bird meetings were held September 14 - 15, 2009, and mammal meetings were held September 15 - 16, 2009. Representatives from WGFD and WYNDD attended all meetings; representatives from other organizations (e.g., USDA Forest Service, USDI Bureau of Land Management, regional universities, environmental consultants and regional non-profit groups) were present at some of the meetings.

## OCCUPANCY

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The occupancy attribute for each species within each watershed is classified into the following five categories: Known Recent Resident, Suspected Recent Resident, Accidental Occupant, Historical Resident, or Never a Resident. For the purpose of mapping the range in a binary format (i.e., within range vs. outside range), "Known" and "Suspected" HUCs are considered to be within a species' range, while "Accidental," "Historical," and "Never" HUCs are considered outside a species' range.

1. **Known Recent Resident** ("Known") -- This attribute indicates that the range mapping team was aware of a recently documented observation of the species in that particular watershed, and that the species was believed to occupy that watershed at the time of mapping. Experts collectively agreed that 1985 would be used as a cutoff for recent occurrence for this map set. Thus, for a HUC to be labeled as "Known," there must have been a documented occurrence of the species in that HUC in or since 1985.
2. **Suspected Recent Resident** ("Suspected") -- This value indicates that the range mapping team was not aware of a recently documented observation of the species in that particular watershed, but they still believed the species likely occupied that watershed at the time of mapping. Again, the cutoff for recent residency was 1985. Therefore, a "Suspected" HUC can fit one of two descriptions (not mutually exclusive):
  - a. There is a record of the species being observed in the HUC prior to 1985, but none since. Additionally, experts agreed that habitat and population

conditions have probably not changed enough to preclude recent occupation.

- b. There is no record of the species being observed in the HUC, but experts agreed that habitat for the species likely occurred there at the time of mapping and, furthermore, the HUC is close enough to known population centers for individuals to occupy it. These assessments varied widely by species, and in particular with the degree to which a species was thought to have been adequately inventoried in the field.
3. **Accidental Occupant** (“Accidental”) -- This indicates that the range mapping team was aware of a recently documented observation of the species in that particular watershed, but the species is not believed to be a regular occupant or “resident,” in the common understanding of that term. This designation was most common for birds, which are highly mobile and/or migratory and often occur sporadically in areas outside of their regularly-occupied range. Accidental occurrences were also common for wide-ranging mammals (e.g., wolverine, lynx) and species that are incidentally transported by humans (e.g., turtles, snakes collected as ‘pets’). In general, a HUC with documented observations was considered accidental if there was expert consensus that the species did not occur in that HUC more than (roughly) two out of five years (i.e., there was consensus that it was absent from the HUC more often than it was present in the HUC).
  4. **Historical Resident** (“Historical”) -- This indicates that the range mapping team believed a watershed was historically part of a species’ range, but did not believe it was part of the current range. This category was used only when recent evidence clearly suggested local extirpation. Thus the criteria for its use varied by species and with the thoroughness with which they were monitored in the field.
  5. **Never a Resident** (“Never”) -- This indicates that the range mapping team believed that these watersheds were not, and never have been, part of a species’ range. This designation means that the HUC must also have “Season” and “Origin” values of “Never” for the target species.

## SEASON

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The season attribute describes the principal temporal occurrence of each species within each watershed, using the following six categories: Summer, Winter, Spring/Fall Only, Year-Round, Unknown, and Never a Resident.

1. **Summer** -- Occupancy within the watershed is primarily during the summer, which is often synonymous with the breeding season. This designation refers primarily to migratory species or species that undergo annual range shifts within Wyoming. It is understood that HUCs supporting summer occupation are also largely occupied by the target species during migratory periods as well.
2. **Winter** -- Occupancy within the watershed is primarily during the winter. This designation refers primarily to migratory species or species that undergo annual range

shifts within Wyoming. It is understood that HUCs supporting winter occupation are also largely occupied by the target species during migratory periods as well.

3. **Spring/Fall Only** -- Occupancy within the watershed is almost exclusively during the spring and/or fall seasons, and generally represents migratory range for the species.
4. **Year-Round** -- Occupancy within the watershed occurs year-round. This typically refers to ranges of non-migratory taxa, but occasionally refers to migratory taxa with “leapfrog” migrations or similar dynamics that result in different population segments occupying the same area in different seasons.
5. **Unknown** -- Insufficient data exist to determine seasonal usage within the watershed.
6. **Never** -- The range mapping team believes that these watersheds are not, and never have been, part of the species’ range, during any season. This designation means that the particular HUC must also have “Occupancy” and “Origin” values of “Never” for the target species.

## ORIGIN

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The origin attribute denotes whether the species is considered native to the HUC in question, using the following five categories: Native - Indigenous, Native - Reintroduced, Exotic, Unknown, or Never. Temporal cutoffs for origin are vague, somewhat subjective and often species-specific. They generally represent expert consensus regarding when and how the species became a resident rather than application of strict rules.

1. **Native-Indigenous** (“Indigenous”) -- This value indicated a species was native to the HUC in question and was believed to have regularly occupied that watershed through most of recent history. In this context, recent history generally refers to the period of time since regular human settlement. Further, occurrence is NOT thought to be due to deliberate or inadvertent human-mediated translocation or due to human-induced land cover changes.
2. **Native-Reintroduced** (“Reintroduced”) -- This indicated a species was native to the HUC in question, but was extirpated and subsequently reintroduced by humans. For this designation, extirpation could have occurred at virtually any time, but reintroduction must have been facilitated by humans (i.e., a native animal that naturally re-colonized a HUC would be considered Indigenous).
3. **Exotic** -- This indicated that a species was not thought to be native to the watershed, though it may be native to the continent, or even to other portions of Wyoming. This necessitated a subjective judgment, based on expert consensus, regarding when and how the species became a resident. In contrast to native species, the presence of an exotic species in a HUC was likely due to deliberate or inadvertent human-mediated translocation or due to human-induced land cover changes.
4. **Unknown** -- This indicated insufficient data existed for experts to determine the nativity of the species for the HUC in question.

5. **Never** -- This indicated that the range mapping team believed that the HUC in question was not, and never has been, part of the species' range. This designation means that the particular HUC must also have "Occupancy" and "Season" values of "Never" for the target species.

## GEODATABASE INFORMATION

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The range of each species in the SGCN list is represented by a table in a geodatabase accompanying this report (**FINAL\_AWVED\_SGCN\_RANGE\_MAPS\_V01.gdb**). Within these tables, each row contains a 10-digit watershed identifier ("*HUC10*"), as well as the Occupancy, Season, and Origin attributes for the species within that watershed. In order to provide the most efficient storage and maintenance of the range data, each species' range data are stored in a separate table.

Range maps for individual species can be geographically displayed by linking the relevant table to a spatial representation of the HUCs based on a watershed identifier present in both the species' range tables and the watershed Feature Class. Thus, the user must join the range table for the species of interest (e.g. "*Range\_Centrocerus\_urophasianus*") to the watershed feature class ("*HUC\_BOUNDARIES*") in GIS software, such as ArcMap, using the "*HUC10*" field present in each of these datasets. Since many HUCs extend outside Wyoming, if users wish to display or analyze a species' range solely within the Wyoming state boundary, we suggest first clipping the "*HUC\_BOUNDARIES*" layer to the area of interest.

## REFERENCES:

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Simley, J.D. and Carswell Jr., W.J.. 2009. THE NATIONAL MAP - Hydrography: U.S. Geological Survey Fact Sheet 2009-3054, 4 p.

Wyoming Game and Fish Department (WGFD). 2005. A Comprehensive Wildlife Conservation Strategy for Wyoming. Available online:  
<http://gf.state.wy.us/wildlife/CompConvStrategy/index.asp>.

## APPENDIX

This appendix presents the list of species for which range maps were developed as part of the AWVED process. This list includes all 152 terrestrial vertebrate Species of Greatest Conservation Need listed in the 2005 Comprehensive Wildlife Conservation Strategy (WGFD 2005), plus several additional species that are being considered during the 2010 revision of the State Wildlife Action Plan. Species are presented in alphabetical order by scientific name within taxonomic group (Birds, Amphibians, Reptiles, Mammals).

The final column in the list presents the proportion of watersheds labeled as “Known Recent Resident” versus “Suspected Recent Resident” based on the definitions discussed above. This provides a concise measurement of how well the occurrence of a species is documented in Wyoming. For example, the range of sage grouse and many colonial nesting water birds (e.g., common loon) are well known. In contrast, the range of many small mammals and reptiles are very poorly defined, being largely assumed based on general habitat characteristics.

<u>Scientific Name</u>	<u>Common Name</u>	<u>Included in 2005 CWCS</u>	<u>Proportion of HUCs in Range Containing Known, Recent Occurrences<sup>1</sup></u>
<b><u>BIRDS</u></b>			
<i>Accipiter gentilis</i>	Northern Goshawk	Yes	0.599
<i>Aechmophorus clarkii</i>	Clark's Grebe	Yes	0.114
<i>Aechmophorus occidentalis</i>	Western Grebe	Yes	0.295
<i>Aegolius funereus</i>	Boreal Owl	Yes	0.224
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	Yes	0.327
<i>Amphispiza belli</i>	Sage Sparrow	Yes	0.507
<i>Anas acuta</i>	Northern Pintail	-	0.423
<i>Aphelocoma californica</i>	Western Scrub-Jay	Yes	0.209
<i>Ardea herodias</i>	Great Blue Heron	Yes	0.634
<i>Asio flammeus</i>	Short-eared Owl	Yes	0.291
<i>Athene cunicularia</i>	Burrowing Owl	Yes	0.520
<i>Aythya affinis</i>	Lesser Scaup	Yes	0.273
<i>Aythya americana</i>	Redhead	Yes	0.300
<i>Aythya valisineria</i>	Canvasback	Yes	0.117
<i>Baeolophus ridgwayi</i>	Juniper Titmouse	Yes	0.314
<i>Bartramia longicauda</i>	Upland Sandpiper	Yes	0.580
<i>Botaurus lentiginosus</i>	American Bittern	Yes	0.096
<i>Bucephala islandica</i>	Barrow's Goldeneye	Yes	0.263

<u>Scientific Name</u>	<u>Common Name</u>	<u>Included in 2005 CWCS</u>	<u>Proportion of HUCs in Range Containing Known, Recent Occurrences<sup>T</sup></u>
<b><i>BIRDS continued</i></b>			
<i>Buteo regalis</i>	Ferruginous Hawk	Yes	0.710
<i>Buteo swainsoni</i>	Swainson's Hawk	Yes	0.590
<i>Calamospiza melanocorys</i>	Lark Bunting	Yes	0.493
<i>Calcarius mccownii</i>	McCown's Longspur	Yes	0.310
<i>Calcarius ornatus</i>	Chestnut-collared Longspur	Yes	0.177
<i>Centrocercus urophasianus</i>	Greater Sage-Grouse	Yes	0.904
<i>Charadrius montanus</i>	Mountain Plover	Yes	0.361
<i>Chlidonias niger</i>	Black Tern	Yes	1.000
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	Yes	0.448
<i>Cygnus buccinator</i>	Trumpeter Swan	Yes	0.776
<i>Dolichonyx oryzivorus</i>	Bobolink	Yes	0.111
<i>Egretta thula</i>	Snowy Egret	Yes	0.217
<i>Empidonax traillii</i>	Willow Flycatcher	Yes	0.135
<i>Falco columbarius</i>	Merlin	Yes	0.409
<i>Falco peregrinus</i>	Peregrine Falcon	Yes	0.610
<i>Gavia immer</i>	Common Loon	Yes	1.000
<i>Glaucidium gnoma</i>	Northern Pygmy-Owl	Yes	0.143
<i>Grus canadensis</i>	Greater Sandhill Crane	Yes	0.839
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Yes	0.778
<i>Histrionicus histrionicus</i>	Harlequin Duck	Yes	0.588
<i>Icterus parisorum</i>	Scott's Oriole	Yes	0.069
<i>Larus pipixcan</i>	Franklin's Gull	Yes	1.000
<i>Leucosticte atrata</i>	Black Rosy-Finch	Yes	0.167
<i>Leucosticte australis</i>	Brown-capped Rosy Finch	Yes	0.154
<i>Melanerpes lewis</i>	Lewis' Woodpecker	Yes	0.148
<i>Myiarchus cinerascens</i>	Ash-throated Flycatcher	Yes	0.275
<i>Numenius americanus</i>	Long-billed Curlew	Yes	0.319
<i>Nycticorax nycticorax</i>	Black-crowned Night-Heron	Yes	0.216
<i>Oreoscoptes montanus</i>	Sage Thrasher	Yes	0.642
<i>Pelecanus erythrorhynchos</i>	American White Pelican	Yes	0.400
<i>Picoides arcticus</i>	Black-backed Woodpecker	Yes	0.128
<i>Picoides dorsalis</i>	American Three-toed Woodpecker	Yes	0.239

<u>Scientific Name</u>	<u>Common Name</u>	<u>Included in 2005 CWCS</u>	<u>Proportion of HUCs in Range Containing Known, Recent Occurrences</u> <sup>T</sup>
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**BIRDS continued**

<i>Plegadis chihi</i>	White-faced Ibis	Yes	0.625
<i>Psaltriparus minimus</i>	Bushtit	Yes	0.209
<i>Rallus limicola</i>	Virginia Rail	Yes	0.038
<i>Sitta pygmaea</i>	Pygmy Nuthatch	Yes	0.066
<i>Spiza americana</i>	Dickcissel	Yes	0.097
<i>Spizella breweri</i>	Brewer's Sparrow	Yes	0.678
<i>Sterna caspia</i>	Caspian Tern	Yes	1.000
<i>Sterna forsteri</i>	Forster's Tern	Yes	0.556
<i>Strix nebulosa</i>	Great Gray Owl	Yes	0.367
<i>Tympanuchus phasianellus columbianus</i>	Columbian Sharp-tailed Grouse	Yes	0.429

**AMPHIBIANS**

<i>Ambystoma mavortium</i>	Tiger Salamander	Yes	0.277
<i>Anaxyrus baxteri</i>	Wyoming Toad	Yes	0.750
<i>Anaxyrus boreas boreas</i>	Boreal Toad (Western Toad)	Yes	0.406
<i>Anaxyrus cognatus</i>	Great Plains Toad	Yes	0.049
<i>Anaxyrus woodhousii woodhousii</i>	Rocky Mountain Toad	Yes	0.141
<i>Lithobates catesbeianus</i>	American Bullfrog	Yes	0.286
<i>Lithobates pipiens</i>	Northern Leopard Frog	Yes	0.458
<i>Lithobates sylvaticus</i>	Wood Frog	Yes	0.375
<i>Pseudacris maculata</i>	Boreal Chorus Frog	Yes	0.298
<i>Rana luteiventris</i>	Columbia Spotted Frog	Yes	0.515
<i>Spea bombifrons</i>	Plains Spadefoot	Yes	0.085
<i>Spea intermontana</i>	Great Basin Spadefoot	Yes	0.151

**REPTILES**

<i>Apalone spinifera hartwegi</i>	Western Spiny Softshell	Yes	0.176
<i>Aspidoscelis sexlineatus viridis</i>	Prairie Racerunner	Yes	0.077
<i>Charina bottae</i>	Rubber Boa	Yes	0.375
<i>Chrysemys picta bellii</i>	Western Painted Turtle	Yes	0.131
<i>Coluber constrictor flaviventris</i>	Eastern Yellow-bellied Racer	Yes	0.176
<i>Crotalus oreganus concolor</i>	Midget Faded Rattlesnake	Yes	0.583
<i>Crotalus viridis</i>	Prairie Rattlesnake	Yes	0.453

<u>Scientific Name</u>	<u>Common Name</u>	<u>Included in 2005 CWCS</u>	<u>Proportion of HUCs in Range Containing Known, Recent Occurrences<sup>T</sup></u>
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**REPTILES continued**

<i>Heterodon nasicus</i>	Plains Hog-nosed Snake	Yes	0.114
<i>Holbrookia maculata maculata</i>	Great Plains Earless Lizard	Yes	0.125
<i>Lampropeltis triangulum multistriata</i>	Pale Milksnake	Yes	0.057
<i>Opheodrys vernalis</i>	Smooth Green Snake	Yes	0.353
<i>Phrynosoma hernandesi</i>	Greater Short-horned Lizard	Yes	0.285
<i>Plestiodon multivirgatus multivirgatus</i>	Northern Many-lined Skink	Yes	0.000
<i>Pituophis catenifer deserticola</i>	Great Basin Gophersnake	Yes	0.300
<i>Pituophis catenifer sayi</i>	Bullsnake	Yes	0.369
<i>Sceloporus consobrinus</i>	Prairie Lizard	Yes	0.114
<i>Sceloporus graciosus graciosus</i>	Northern Sagebrush Lizard	Yes	0.194
<i>Sceloporus tristichus</i>	Plateau Fence Lizard	Yes	0.145
<i>Storeria occipitomaculata pahasapae</i>	Black Hills Redbelly Snake	Yes	0.300
<i>Tantilla Nigriceps</i>	Plains Black-headed Snake	Yes	0.158
<i>Terrapene ornata ornata</i>	Ornate Box Turtle	Yes	0.000
<i>Thamnophis elegans vagrans</i>	Wandering Gartersnake	Yes	0.280
<i>Thamnophis radix</i>	Plains Gartersnake	Yes	0.052
<i>Thamnophis sirtalis fitchi</i>	Valley Gartersnake	Yes	0.167
<i>Thamnophis sirtalis parietalis</i>	Red-sided Gartersnake	Yes	0.235
<i>Urosaurus ornatus wrighti</i>	Northern Tree Lizard	Yes	0.375

**MAMMALS**

<i>Alces alces</i>	Moose	Yes	0.866
<i>Antrozous pallidus</i>	Pallid Bat	Yes	0.096
<i>Bassariscus astutus</i>	Ringtail	-	0.150
<i>Brachylagus idahoensis</i>	Pygmy Rabbit	Yes	0.793
<i>Chaetodipus hispidus</i>	Hispid Pocket Mouse	Yes	0.011
<i>Corynorhinus townsendii</i>	Townsend's Big-eared Bat	Yes	0.168
<i>Cynomys leucurus</i>	White-tailed Prairie Dog	Yes	0.752
<i>Cynomys ludovicianus</i>	Black-tailed Prairie Dog	Yes	0.693
<i>Eptesicus fuscus</i>	Big Brown Bat	Yes	0.137
<i>Euderma maculatum</i>	Spotted Bat	Yes	0.158
<i>Geomys bursarius</i>	Plains Pocket Gopher	Yes	0.013

<u>Scientific Name</u>	<u>Common Name</u>	<u>Included in 2005 CWCS</u>	<u>Proportion of HUCs in Range Containing Known, Recent Occurrences<sup>T</sup></u>
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**MAMMALS continued**

<i>Glaucomys sabrinus</i>	Northern Flying Squirrel	Yes	0.120
<i>Gulo gulo</i>	Wolverine	Yes	0.717
<i>Lasionycteris noctivagans</i>	Silver-haired Bat	Yes	0.154
<i>Lasiurus borealis</i>	Eastern Red Bat	-	0.049
<i>Lasiurus cinereus</i>	Hoary Bat	Yes	0.143
<i>Lemmyscus curtatus</i>	Sagebrush Vole	Yes	0.046
<i>Lontra canadensis</i>	River Otter	Yes	0.419
<i>Lynx canadensis</i>	Canada Lynx	Yes	0.429
<i>Martes americana</i>	Marten	Yes	0.448
<i>Martes pennanti</i>	Fisher	Yes	0.171
<i>Microtus ochrogaster</i>	Prairie Vole	Yes	0.060
<i>Microtus richardsoni</i>	Water Vole	Yes	0.184
<i>Mustela nigripes</i>	Black-footed Ferret	Yes	0.235
<i>Mustela nivalis</i>	Least Weasel	Yes	0.120
<i>Myotis ciliolabrum</i>	Western Small-footed Myotis	Yes	0.138
<i>Myotis evotis</i>	Long-eared Myotis	Yes	0.138
<i>Myotis lucifugus</i>	Little Brown Myotis	Yes	0.165
<i>Myotis septentrionalis</i>	Northern Myotis	Yes	0.200
<i>Myotis thysanodes</i>	Fringed Myotis	Yes	0.083
<i>Myotis volans</i>	Long-legged Myotis	Yes	0.167
<i>Neotamias amoenus</i>	Yellow-pine Chipmunk	-	0.039
<i>Neotamias dorsalis</i>	Cliff Chipmunk	Yes	0.176
<i>Neotamias umbrinus</i>	Unita Chipmunk	-	0.045
<i>Ochotona princeps</i>	American Pika	-	0.847
<i>Ovis canadensis</i>	Bighorn Sheep	Yes	0.802
<i>Perognathus fasciatus</i>	Olive-backed Pocket Mouse	Yes	0.040
<i>Perognathus flavescens</i>	Plains Pocket Mouse	Yes	0.029
<i>Perognathus flavus</i>	Silky Pocket Mouse	Yes	0.012
<i>Perognathus parvus</i>	Great Basin Pocket Mouse	Yes	0.111
<i>Peromyscus crinitus</i>	Canyon Mouse	Yes	0.105
<i>Peromyscus truei</i>	Pinyon Mouse	Yes	0.105
<i>Phenacomys intermedius</i>	Western Heather Vole	Yes	0.034

<u>Scientific Name</u>	<u>Common Name</u>	<u>Included in 2005 CWCS</u>	<u>Proportion of HUCs in Range Containing Known, Recent Occurrences</u> <sup>1</sup>
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***MAMMALS continued***

<i>Reithrodontomys montanus</i>	Plains Harvest Mouse	Yes	0.007
<i>Sciurus aberti</i>	Abert's Squirrel	Yes	0.222
<i>Sorex haydeni</i>	Hayden's Shrew	Yes	0.179
<i>Sorex hoyi</i>	Pygmy Shrew	Yes	0.105
<i>Sorex nanus</i>	Dwarf Shrew	Yes	0.024
<i>Sorex palustris</i>	Water Shrew	Yes	0.053
<i>Sorex preblei</i>	Preble's Shrew	Yes	0.029
<i>Sorex vagrans</i>	Vagrant Shrew	Yes	0.018
<i>Spermophilus armatus</i>	Uinta Ground Squirrel	Yes	0.205
<i>Spermophilus elegans</i>	Wyoming Ground Squirrel	Yes	0.296
<i>Spermophilus spilosoma</i>	Spotted Ground Squirrel	Yes	0.035
<i>Thomomys clusius</i>	Wyoming Pocket Gopher	Yes	0.086
<i>Thomomys idahoensis</i>	Idaho Pocket Gopher	Yes	0.054
<i>Ursus arctos</i>	Grizzly Bear	Yes	0.707
<i>Vulpes velox</i>	Swift Fox	Yes	0.287
<i>Zapus hudsonius campestris</i>	Bear Lodge Meadow Jumping Mouse	Yes <sup>2</sup>	0.138
<i>Zapus hudsonius preblei</i>	Preble's Meadow Jumping Mouse	Yes <sup>2</sup>	0.218

Footnotes:

1. For those species whose range in Wyoming varies seasonally, this proportion is based on the primary season of occurrence. For example, if a bird breeds in Wyoming but migrates out of the state during other times, the Proportion of HUCs containing known occurrences is calculated based on range during the breeding season.
2. Jumping mice are included as SGCN at the species level, but have been listed separately here due to conservation concern associated with the Preble's subspecies.