DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018–AV64

Endangered and Threatened Wildlife and Plants; Revised Proposed Rule To Amend the Listing for the Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei)* To Specify Over What Portion of Its Range the Subspecies Is Threatened

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Revised proposed rule.

SUMMARY: Under the authority of the Endangered Species Act of 1973, as amended (Act), we, the U.S. Fish and Wildlife Service (Service), revise our February 2, 2005 (70 FR 5404), proposed rule to remove the Preble's meadow jumping mouse (*Zapus hudsonius preblei*) (Preble's) from the List of Endangered and Threatened Wildlife. We now propose to amend the listing for the Preble's meadow jumping mouse to specify over what portion of its range the subspecies is threatened. The best scientific and commercial data available demonstrates that: The Preble's meadow jumping mouse is a valid subspecies and should not be delisted based upon taxonomic revision; the subspecies is not threatened throughout all of its range; and the portion of the current range of the subspecies located in Colorado represents a significant portion of the current range where the Preble's meadow jumping mouse is likely to become endangered within the foreseeable future, and the subspecies in that portion of its range should retain its threatened status. We seek comments from the public regarding this revised proposal. Comments previously submitted need not be resubmitted as they have already been incorporated into the public record and will be fully considered in the final determination.

DATES: *Written Comments:* We will consider comments on this revised proposed rule that we receive by the close of business on January 22, 2008. Any comments we receive after the closing date may not be considered in our final decision on the proposal.

Open House and Public Hearing: We will hold an open house and public hearing on this revised proposed rule in Colorado on December 10, 2007 and in Wyoming on December 12, 2007. Each open house will run from 4 p.m. to 5 p.m., with brief presentations about this revised proposed rule given at 4 p.m., and each public hearing will run from 6 p.m. to 8 p.m.

ADDRESSES: *Written Comments:* If you wish to comment on this revised proposed rule, you may submit your comments and materials by any one of several methods:

(1) *By mail to:* Susan Linner, Field Supervisor, Colorado Field Office, Ecological Services, P.O. Box 25486, MS–65412, Denver Federal Center, Denver, CO 80225.

(2) *By hand-delivery to:* Susan Linner, Colorado Field Office at 134 Union Blvd., Suite 670, Lakewood, CO 80228.

(3) *By fax to:* (303) 236–4005.

(4) *By electronic mail (e-mail) to: FW6_PMJM@fws.gov*. Please see the Public Comments Solicited section below for other information about electronic filing.

(5) *By the Federal eRulemaking Portal at: http://www.regulations.gov*. Follow the instructions on that Web site for submitting comments.

Open House and Public Hearing: We will hold an open house and public hearing at the Colorado Field Office, 134 Union Boulevard, Room 100A—Eagle Conference Room, Lakewood, CO 80228 and at the First State Bank Conference Center, 1405 16th Street, Wheatland, WY 82201.

FOR FURTHER INFORMATION CONTACT: Susan Linner, Field Supervisor, U.S. Fish and Wildlife Service, Colorado Field Office at 134 Union Blvd., Suite 670, Lakewood, CO 80228; telephone (303) 236–4773; facsimile (303) 236–4005. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at (800) 877–8339.

SUPPLEMENTARY INFORMATION:

Public Comments Solicited

We intend that any final action resulting from this proposal will be as accurate and as effective as possible. Therefore, we solicit data, comments, new information, or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning this revised proposed rule. Generally, we seek information, data, and comments concerning:

(1) Survey results for Preble's meadow jumping mouse, as well as any studies that may show distribution, status, population size, or population trends;

(2) Pertinent aspects of life history, ecology, and habitat use of Preble's meadow jumping mouse, especially those pertaining to its relationship to the western jumping mouse *(Zapus princeps)*;

(3) Current and foreseeable threats faced by the Preble's meadow jumping mouse in relation to the five factors (as defined in section 4(a)(1) of the Act (16 U.S.C. 1531 et seq.));

(4) Effects of current and foreseeable land management practices on Preble's meadow jumping mouse status, including conservation efforts;

(5) Our analysis and conclusions regarding the conservation status of the Preble's meadow jumping mouse throughout all of its range, in particular information relative to the long-term security of existing populations of the subspecies in Wyoming.

(6) Our analysis and conclusions regarding ''significant portion of its range'' in light of the March 14, 2007, Department of the Interior, Solicitor Memorandum opinion available at *http://www.doi.gov/solicitor/M37013.pdf;*

(7) The contribution of both the Wyoming and Colorado portions of the range to the status of the subspecies;

(8) The range of the subspecies as defined in this proposal and the areas where the protections of the Act should remain in place (see ''*Significant Portion of the Range Where the Subspecies is Threatened'' for specific information solicited*) and

(9) The Sustainable Ecosystems Institute (SEI) report ''Evaluation of scientific information regarding Preble's meadow jumping mouse'' (available at *http://www.fws.gov/mountain-prairie/species/mammals/preble/*) and other information concerning the taxonomic status of Preble's meadow jumping mouse.

You may submit your comments and materials concerning this revised proposed rule by one of several methods (see **ADDRESSES**). If you use e-mail to submit your comments, please submit them in ASCII file format and avoid the use of special characters and encryption. Please include ''Attn: Preble's meadow jumping mouse'' in your e-mail subject header, preferably with your name and return address in the body of your message. If you do not receive a confirmation from the system that we have received your e-mail, contact us directly by calling our Colorado Field Office at (303) 236–4773. Please note that we must receive comments by the date specified in the **DATES** section in order to consider them in our final determination and that we will close out the e-mail address *FW6_PMJM@fws.gov* at the termination of the public comment period.

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that

your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so. We will always make submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations and businesses, available for public inspection in their entirety.

Comments and materials we receive, as well as supporting documentation we used in preparing this revised proposed rule, will be available for public inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service Colorado Field Office, 134 Union Blvd., Suite 670, Lakewood, CO 80228, (telephone (303) 236–4773) . We will take into consideration all substantive comments and any pertinent information we receive during the comment period on this revised proposed rule during the preparation of a final rulemaking. Accordingly, the final decision may differ from this proposal.

Open Houses and Public Hearings

We will hold open houses and public hearings on the dates listed in the **DATES** section, and at the addresses listed in the **ADDRESSES** section, of this document. Anyone wishing to make an oral statement for the record at either of the public hearing is encouraged to provide a written copy of his or her statement and present it to us at the hearing. Persons wishing to make an oral statement at the public hearing may sign up only at the open house or at the public hearing; we will not reserve speaking time in advance of the open house. In the event that there is a large attendance, the time allotted for oral statements may be limited. Oral and written statements receive equal consideration. There are no limits on the length of written comments submitted to us. If you have any questions concerning the open house or public hearing, please contact Sharon Rose at (303) 236–4580. Persons needing reasonable accommodations in order to attend and participate in the open house or public hearing should contact Sharon Rose as soon as possible in order to allow sufficient time to process requests. Please call no later than 1 week before the hearing date. Information regarding this revised proposal is available in alternative formats upon request.

Previous Federal Actions

We listed Preble's meadow jumping mouse as threatened under the Act on May 13, 1998 (63 FR 26517). We designated critical habitat for Preble's meadow jumping mouse on June 23, 2003 (68 FR 37275). On May 22, 2001 (66 FR 28125), we adopted a final section 4(d) special rule for the Preble's meadow jumping mouse that provides exemptions from section 9 take prohibitions for certain rodent control activities, ongoing agricultural activities, maintenance and replacement of existing landscaping, and existing uses of water. On October 1, 2002 (67 FR 61531), we amended this rule to provide exemptions for certain noxious weed control and ditch maintenance activities. The special rule, as amended, was scheduled to sunset May 22, 2004, but was made permanent on May 20, 2004 (69 FR 29101).

In June 2000, the Service established the Preble's Meadow Jumping Mouse Recovery Team composed of scientists and stakeholders. In June 2003, the Recovery Team provided their recommendations to the Service in the form of a draft recovery plan. This technical working draft was revised by the Service in November 2003. The Preliminary Draft Recovery Plan suggested long-term protection of: One large population (with June abundances of 2,500 or more individuals), two medium populations (with June abundances of 500–2,499 individuals), and six small populations (with evidence of occupancy; possibly 150 mice) within the North Platte River basin two large, three medium, and eighteen small populations within the South Platte River basin and one large population, and six small populations within the Arkansas River basin (Service 2003b, p. 19–23). Recovery planning efforts were halted in December 2003 after new information became available questioning the taxonomic validity of the subspecies. While the availability of this document (hereafter referred to as the Preliminary Draft Recovery Plan (Service 2003b)) has not yet been announced in the **Federal Register**, it represents the best available information on the recovery needs of the subspecies.

On December 23, 2003, we received two nearly identical petitions, from the State of Wyoming's Office of the Governor and Coloradans for Water Conservation and Development, seeking to remove Preble's meadow jumping mouse from the Federal List of Endangered and Threatened Wildlife (Freudenthal 2003; Sonnenberg 2003). The petitions maintained that Preble's meadow jumping mouse should be delisted based on the taxonomic revision suggested by Ramey *et al.* (2003) and new distribution, abundance, and trends data which suggested the subspecies was no longer threatened or endangered (Freudenthal 2003, p. 1; Sonnenberg 2003, p. 1).

On March 31, 2004, we published a notice announcing a 90-day finding that the petitions presented substantial information indicating that the petitioned action may be warranted (69 FR 16944). On February 2, 2005, we published a 12-month finding that the petitioned action was warranted, and a proposed rule to remove Preble's meadow jumping mouse from the Federal List of Endangered and Threatened Wildlife, and opened a 90-day public comment period (70 FR 5404). The proposed delisting was based upon a taxonomic revision suggested by Ramey *et al.* (2004a (a revision of Ramey *et al.* 2003)), which concluded that Preble's meadow jumping mouse should be synonymized with a neighboring subspecies (Ramey *et al.* 2004a, pp. 1, 13). Although this report remained unpublished and had received mixed peer reviews, we concluded that a lack of distinct genetic and morphologic differences suggested that Preble's meadow jumping mouse was likely not a valid subspecies of meadow jumping mouse (*Zapus hudsonius*). Considering the weight that we gave Ramey *et al.* (2004a) in the proposed delisting, verifying the results of this study prior to making a final decision on the proposal was a high priority of the Service (Williams 2004; Morgenweck 2005). As such, we contracted with the U.S. Geological Survey (USGS) to conduct additional genetic analysis of Preble's meadow jumping mouse and four neighboring subspecies of meadow jumping mice (U.S. Geological Survey 2005, pp. 1–4).

On January 25, 2006, USGS released its report concluding that Preble's meadow jumping mouse should not be synonymized with neighboring subspecies of meadow jumping mice (King *et al.* 2006a, pp. 2, 29). On February 17, 2006, the Service extended the rulemaking process an additional 6 months as allowed under section 4(b)(6)(B)(i) of the Act because this USGS study indicated that there was substantial disagreement regarding the sufficiency or accuracy of the available data relevant to the determination contained in our proposed rule (71 FR 8556). We reopened the comment period for an additional 60 days and announced that we intended to assemble a panel of experts to carefully review and assess the two studies.

On March 30, 2006, we published a notice of availability of the King *et al.* (2006a) and Ramey *et al.* (2005) data and extended the comment period on the proposed delisting rule an additional 30 days (71 FR 16090). We then contracted with Sustainable Ecosystems Institute (SEI) to organize a scientific review panel to analyze, assess, and weigh the reasons why the data, findings, and conclusions of King *et al.* differ from the data, findings, and conclusions of Ramey *et al.* (as written in this sentence, and hereafter, ''Ramey *et al.*'' or ''King *et al.*'' without a modifying date refers to the overall work of these authors instead of a specific publication) (Service 2006, p. 14). On July 21, 2006, SEI delivered a final report to the Service (SEI 2006a).

On September 26, 2006, the State of Wyoming submitted a 60-day notice of intent to sue over our failure to publish a final determination on our 2005 proposed delisting rule within the timeframes allowed by the Act. On January 24, 2007, the State of Wyoming filed a petition for review with the court. On June 22, 2007, the Service and the State of Wyoming reached a settlement agreement which required that, by October 31, 2007, we submit to the **Federal Register** for publication either (1) a withdrawal of our 2005 proposed delisting regulation; or (2) a new proposed regulation considering the Preble's meadow jumping mouse's taxonomy and the subspecies' threatened status in light of all current distribution, abundance, and trends data (*State of Wyoming* v. *U.S. Department of the Interior*, No. 07CV025J (District of Wyoming 2007)). If a new proposed regulation is deemed necessary, the Service is required to submit a final determination to the **Federal Register** no later than June 30, 2008.

Public Comments on the 2005 Proposed Rule

From February 2, 2005, through May 3, 2005 (70 FR 5404, February 2, 2005), and from February 17, 2006, through May 18, 2006 (71 FR 8556, February 17, 2006; 71 FR 16090, March 30, 2006), we solicited, from all interested parties, comments and information that might contribute to the final delisting determination for the Preble's meadow jumping mouse. We received a total of 67 written comments, including 28 comments during the initial comment period and 39 during the reopened comment period. These included comments from: The Governor of the State of Wyoming; the Attorney General of the State of Wyoming; the Colorado Department of Natural Resources; U.S. Forest Service, Rocky Mountain Region; 6 comments from local governments; and 57 comments from individuals or groups. During the reopened comment period we also received a challenge under the Information Quality Act (44 U.S.C. 3516) to influential information disseminated by the Service during this rulemaking process. This challenge and our response are available at *http://www.fws.gov/informationquality/*. This response has been appealed and the appeal is currently under review by the Service. Because we received the original challenge during the open public comment period, these issues are considered public comments on our proposed rule.

In accordance with our July 1, 1994, Interagency Cooperative Policy for Peer Review in Endangered Species Act Activities (59 FR 34270), we solicited five expert peer reviews of our proposed rule (70 FR 5404, February 2, 2005). We selected peer reviewers for expertise in genetics, systematics (the science of dealing with the diversity of organisms), and small mammals. We excluded previous peer reviewers of Ramey et al. and King et al. from this solicitation. Three of the experts approached provided comments (Hoekstra 2005; Kelt 2005; Spencer 2005). After reopening the public comment period on February 17, 2006 (71 FR 8556), we contacted the same five experts and invited them to provide additional comments given the availability of new information (i.e., King et al. 2006a). Two of these reviewers provided comments (Kelt 2006; Spencer 2006a).

All previously submitted comments have been included in the public record and will be considered in the final determination regarding this proposal. Comments previously submitted need not be resubmitted. Additionally, all of the previously submitted comments and reviews relevant to the taxonomy discussion were made available to the SEI panel for its consideration. Substantive comments will be addressed in a series of issues and responses in our final determination.

General Information

Meadow jumping mice (*Zapus hudsonius*) are small rodents with long tails, large hind feet, and long hind legs. Total length of an adult is approximately 187 to 255 millimeters (7 to 10 inches), with the tail comprising 108 to 155 millimeters (4 to 6 inches) of that length (Krutzsch 1954, p. 420; Fitzgerald et al. 1994, p. 291).

Across their range, meadow jumping mice typically occur in moist habitats, including low undergrowth consisting of grasses, forbs, or both, in open wet meadows and riparian corridors, or where tall shrubs and low trees provide adequate cover (Krutzsch 1954, p. 351; Armstrong 1972, p. 248; Jones et al. 1983, p. 238). Trainor et al. (2007, pp. 471–472) found that high use areas for Preble's meadow jumping mouse tended to be close to creeks and were positively associated with the percentage of shrubs, grasses, and woody debris. Hydrologic regimes that support Preble's meadow jumping mouse habitat range from large perennial rivers such as the South Platte River to small drainages only 1 to 3 meters (m) (3 to 10 feet (ft)) in width.

Meadow jumping mice are primarily nocturnal or crepuscular (active during twilight), but also may be active during the day. The Preble's meadow jumping mouse uses uplands at least as far out as 100 m (330 ft) beyond the 100-year floodplain (Shenk and Sivert 1999a, p. 11; Ryon 1999, p. 12; Schorr 2001, p. 14; Shenk 2004; Service 2003b, p. 26). While the Preble's meadow jumping mouse dispersal capabilities are thought to be limited, in one instance a Preble's meadow jumping mouse was documented moving as far as 1.1 kilometers (km) (0.7 mile (mi)) in 24 hours (Ryon 1999, p. 12). The Preble's meadow jumping mouse typically enters hibernation between September and October and emerges the following May (Whitaker 1963, p. 5; Meaney et al. 2003).

For additional information on the biology of this subspecies, see the May 13, 1998, final rule to list the Preble's meadow jumping mouse as threatened (63 FR 26517) and the June 23, 2003, final rule designating critical habitat (68 FR 37275).

Taxonomy

The Preble's meadow jumping mouse is a member of the family *Dipodidae* (jumping mice) (Wilson and Reeder 1993, p. 499), which contains four extant genera. Two of these, *Zapus* (jumping mice) and *Napaeozapus* (woodland jumping mice), are found in North America (Hall 1981, p. 841; Wilson and Ruff 1999, pp. 665–667).

In his 1899 study of North American jumping mice, Edward A. Preble concluded the *Zapus* genus consisted of 10 species (Preble 1899, pp. 13–41). According to Preble (1899, pp. 14–21), *Z. hudsonius* (the meadow jumping mouse) included five subspecies. Preble (1899, pp. 20–21) classified all specimens of the meadow jumping mouse from North Dakota, Montana, South Dakota, Wyoming, Nebraska, Colorado, and Missouri as a single subspecies, *Z. hudsonius campestris.* Cockrum and Baker (1950, pp. 1–4) later designated specimens from Nebraska,

Kansas, and Missouri as a separate subspecies, *Z. h. pallidus.*

Krutzsch (1954, pp. 352–355) revised the taxonomy of the *Zapus* genus after studying morphological characteristics of 3,600 specimens. This revision reduced the number of species within this genus from 10 to 3, including *Z. hudsonius* (the meadow jumping mouse), *Z. princeps* (the western jumping mouse), and *Z. trinotatus* (the Pacific jumping mouse). According to Krutzsch (1954, pp. 385–453), the meadow jumping mouse included 11 subspecies.

Krutzsch (1954, pp. 452–453) described and named the subspecies Preble's meadow jumping mouse (*Zapus hudsonius preblei*) based on geographic separation and morphological (physical form and structure of an organism) differences. Krutzsch (1954, pp. 452–453) discussed the presence of physical habitat barriers and the lack of known intergradation (merging gradually through a continuous series of intermediate forms or populations) between the Preble's meadow jumping mouse, known only from eastern Colorado and southeastern Wyoming, and other identified subspecies of meadow jumping mice ranging to the east and north. Additionally, Krutzsch (1954, pp. 452–453) evaluated the morphometric characteristics of 4 adult and 7 non-adult specimens. Acknowledging the small number of samples upon which his conclusion was based, Krutzsch (1954, p. 453) nonetheless concluded that the differences between Preble's meadow jumping mouse and neighboring meadow jumping mice was considerable and enough to warrant a subspecific designation.

In Krutzsch's analysis, the subspecies neighboring Preble's meadow jumping mouse included *Z. h. campestris* in northwestern Wyoming, southwestern South Dakota, and southeastern Montana; *Z. h. intermedius* in North Dakota, and northwestern, central, and eastern South Dakota; and *Z. h. pallidus* (Cockrum and Baker 1950) in Nebraska, Kansas, and Missouri (Krutzsch 1954, pp. 441–442, 447–452). Among recognized subspecies, Krutzsch (1954, p. 452) found that Preble's meadow jumping mouse most closely resembled *Z. h. campestris* from northeastern Wyoming, but documented differences in coloration and skull characteristics.

In 1981, Hafner et al. (1981, p. 501) identified *Zapus hudsonius luteus* from Arizona and New Mexico as the 12th subspecies of meadow jumping mouse. This population had previously been assumed to be a subspecies of western jumping mouse (Krutzsch 1954, pp. 406–407; Hall and Kelson 1959, pp. 774–776; Jones 1981, p. iv).

Krutzsch's description (1954) as modified by Hafner et al. (1981, p. 501), with 12 subspecies of meadow jumping mice, was generally accepted by most small mammal taxonomists for the past half-century (Hall and Kelson 1959, pp. 771–774; Long 1965, pp. 664–665; Armstrong 1972, pp. 248–249; Whitaker 1972, pp. 1–2; Hall 1981, pp. 841–844; Jones et al. 1983, pp. 238–239; Clark and Stromberg 1987, p. 184; Wilson and Reeder 1993, p. 499; Hafner et al. 1998, pp. 120–121; Wilson and Ruff 1999, pp. 666–667).

Other Taxonomic Information Available Prior to Listing

As part of a doctoral dissertation, Jones (1981, pp. 4–29, 229–303, 386–394, 472) analyzed the morphology of 9,900 specimens within the *Zapus* genus from across North America, including 39 Preble's meadow jumping mouse specimens. Jones's dissertation (1981, p. 144) concluded that the Pacific jumping mouse was not a valid taxon and suggested reducing the number of species in the genus to two (the western jumping mouse and the meadow jumping mouse). At the subspecific level, Jones (1981, pp. V, 303) concluded that no population of meadow jumping mouse was sufficiently isolated or distinct to warrant subspecific status. Regarding the Preble's meadow jumping mouse, Jones (1981, pp. 288–289) wrote that ''No named subspecies is geographically restricted by a barrier, with the possible exception of *Z. h. preblei* [Preble's meadow jumping mouse]'' which ''appears to be isolated,'' but that ''no characteristics indicate that these populations have evolved into a separate taxon.'' Jones did not compare the Preble's meadow jumping mouse to *Z. h. campestris*, a neighboring subspecies, nor did he conduct statistical tests of morphology between the Preble's meadow jumping mouse and any other subspecies. Jones's (1981) findings were not published in a peer-reviewed journal and were not incorporated into the formal jumping mouse taxonomy, leaving his conclusions difficult to evaluate.

Prior to listing, the Colorado Division of Wildlife (CDOW) contracted for a genetic analysis of the Preble's meadow jumping mouse (Riggs et al. 1997). Riggs et al. (1997, p. 1) examined a small number of base-pairs (433) in one region of the mitochondrial deoxyribonucleic acid (mtDNA) (maternally inherited genetic material) across 5 subspecies of meadow jumping mouse (92 specimens). This study concluded that the Preble's meadow jumping mouse specimens formed a homogenous group recognizably distinct from other nearby populations of meadow jumping mice (Riggs et al. 1997, p. 12). At the request of the Service, Hafner (1997, p. 3) reviewed the Riggs study, inspected Riggs' original sequence data, and agreed with its conclusions. The Riggs et al. (1997) results were not published in a peer-reviewed journal. Prior to listing, this study was the only available information concerning the genetic uniqueness of the Preble's meadow jumping mouse.

Our original listing determined that Krutzsch's (1954) revision of the meadow jumping mouse species, including the description of the Preble's meadow jumping mouse, was widely supported by the scientific community as indicated by the available published literature (63 FR 26517, May 13, 1998). Our 1998 determination weighed the information in unpublished reports, such as Jones (1981), and public comments on the rule and found that they did not contain enough scientifically compelling information to suggest that revising the existing taxonomy was appropriate (63 FR 26517, May 13, 1998). Our 1998 conclusion was consistent with Service regulations that require us to rely on standard taxonomic distinctions and the biological expertise of the Department and the scientific community concerning the relevant taxonomic group (50 CFR 424.11).

Taxonomic Information Solicited After Listing

In July 2003, we entered into a cooperative agreement with the Denver Museum of Natural Science (DMNS) to determine if the Preble's meadow jumping mouse was a unique subspecies relative to other nearby subspecies of meadow jumping mice (Service 2003a, pp. 1–2). This task was a priority of the Recovery Team (Service 2003a, pp. 1–2; Service 2003b, pp. iv, 38, 43, 76). In December 2003, we received a draft report from the DMNS examining the uniqueness of the Preble's meadow jumping mouse relative to other nearby subspecies of meadow jumping mice (Ramey et al. 2003). In August 2005, an expanded version of this original report was published in the journal ''Animal Conservation'' (Ramey et al. 2005). This publication included an examination of morphometric differences, mtDNA, and microsatellite DNA (a short, noncoding DNA sequence, usually 2 to 5 base-pairs, that is repeated many times within the genome of an organism). Ramey et al. (2005, pp. 339–341) also examined the literature for evidence of

ecological exchangeability among subspecies (a test of whether individuals can be moved between populations and can occupy the same ecological niche).

Ramey et al.'s morphometric analysis tested 9 skull measurements of 40 Preble's meadow jumping mice, 40 *Z. h. campestris*, and 37 *Z. h. intermedius* specimens (Ramey et al. 2005, p. 331). Their results did not support Krutzsch's (1954, p. 452) original description of the Preble's meadow jumping mouse as ''averaging smaller in most cranial measurements'' (Ramey et al. 2005, p. 334). Ramey et al. (2005, p. 334) found that only one cranial measurement was significantly smaller, while two cranial measurements were significantly larger.

Ramey et al. examined a small number of base-pairs (346) in 1 region of the mtDNA across 5 subspecies of meadow jumping mice (205 specimens) (Ramey et al. 2005, pp. 331–332, 335). Ramey et al. (2005, p. 335, 338) found low levels of difference between the Preble's meadow jumping mouse and neighboring subspecies. Their data demonstrated that all of the mtDNA haplotypes (alternate forms of a particular DNA sequence or gene) found in the Preble's meadow jumping mouse were also found in *Z. h. campestris.* The mtDNA data demonstrated evidence of recent gene flow between the Preble's meadow jumping mouse and neighboring subspecies (Ramey et al. 2005, p. 338).

Ramey et al. (2005, pp. 333–334, 338) analyzed a small number (5) of microsatellite loci (the specific position of a gene or other chromosomal marker) across 5 subspecies of meadow jumping mice (195 specimens). Ramey et al. (2005, p. 340) concluded that these results were consistent with morphometric and mtDNA results.

Based on morphometrics, mtDNA, and microsatellites data, and a lack of recognized adaptive differences, Ramey et al. (2005, p. 340) suggested synonymizing the Preble's meadow jumping mouse and *Z. h. intermedius* with *Z. h. campestris.*

Prior to publication of Ramey et al. (2005) in ''Animal Conservation,'' the CDOW and the Service solicited 16 peer reviews of the 2004 draft report provided to the Service (Ramey et al. 2004a). Fourteen of these reviewers provided comments (Armstrong 2004; Ashley 2004; Bradley 2004; Conner 2004; Crandall 2004; Douglas 2004; Hafner 2004; Meaney 2004; Mitton 2004; Oyler-McCance 2004; Riddle 2004; Sites 2004; Waits 2004; White 2004). In 2005, the Service approached the same 16 experts to review Ramey et al. 2004b (an expansion of Ramey et al. 2004a). Eleven of these reviewers provided comments (Ashley 2005; Baker and Larsen 2005; Bradley 2005; Crandall 2005; Douglas 2005; Hafner 2005; Maldonado 2005; Mitton 2005; Oyler-McCance 2005; Waits 2005; White 2005). In August 2006, ''Animal Conservation'' published two critiques of Ramey et al. (2005) (Martin 2006; Vignieri et al. 2006) and two responses (Crandall 2006b; Ramey et al. 2006a).

While many of the reviewers supported the findings of Ramey et al. (Baker and Larsen 2005; Bradley 2004, 2005; Crandall 2004, 2005; Hafner 2004; Maldonado 2005; Meaney 2004; Mitton 2004, 2005; Riddle 2004; Sites 2004; Waits 2004, 2005), the reviews raised a number of important issues. Some of the most significant issues identified included: (1) Reliance upon museum specimens which can be prone to contamination (Douglas 2004, 2005; Maldonado 2005); (2) the reliability of, and failure to validate, specimens' museum tag locality (and thus subspecies) identification (Ashley 2005; Douglas 2004, 2005; Hafner 2004; Oyler McCance 2004, 2005); (3) reliance upon a small portion of mtDNA (Ashley 2004, 2005; Baker and Larsen 2005; Crandall 2004, 2005; Douglas 2004, 2005; Hafner 2005; Maldonado 2005; Oyler-McCance 2004, 2005; Riddle 2004; Sites 2004; Waits 2004, 2005); (4) the small number of microsatellite DNA loci examined (Vignieri et al. 2006, p. 241); (5) the criteria used and factors considered to test taxonomic validity as well as alternative interpretations of the data (Ashley 2004; Conner 2004; Douglas 2004, 2005; Hafner 2005; Oyler-McCance 2004, 2005; Vignieri et al. 2006, pp. 241–242; White 2004); (6) whether the authors used an appropriate outgroup (a closely related group that is used as a rooting point of a phylogenetic tree) (Douglas 2004); (7) the sampling regime and its impact on the analysis (Maldonado 2005; Oyler-McCance 2004); (8) failure to test all of the morphological characters examined by Krutzsch (1954) (Vignieri et al. 2006, p. 238); (9) an inadequate evaluation of ecological exchangeability and habitat differences among subspecies (Ashley 2004; Conner 2004; Douglas 2004; Meaney 2004; Mitton 2004; Oyler-McCance 2004, 2005; Sites 2004; Vignieri et al. 2006, p. 238; Waits 2004, 2005); and (10) failure to consider the Preble's meadow jumping mouse's geographic isolation (Vignieri et al. 2006, pp. 237–238). Collectively, these critiques indicated that delisting based on the conclusions of Ramey et al. alone might be premature.

Because the proposed rule to delist the Preble's meadow jumping mouse relied solely upon an unpublished report (Ramey et al. 2004a) that had received mixed peer reviews (see above), verifying these results was a high priority of the Service (Morgenweck 2005; Williams 2004). Thus, in 2006, the Service contracted with USGS to conduct an independent genetic analysis of several meadow jumping mouse subspecies (U.S. Geological Survey 2005, pp. 1–4). The USGS study concluded that the Preble's meadow jumping mouse should not be synonymized with neighboring subspecies (King et al. 2006a, pp. 2, 29). An expanded version of this report was published in the journal ''Molecular Ecology'' (King et al. 2006b). This publication included an examination of microsatellite DNA, 2 regions of mtDNA, and 15 specimens critical to the conclusions of Ramey et al. (2005).

King et al.'s (2006b, p. 4336) microsatellite analysis examined approximately 4 times the number of microsatellite loci (21) and 1½ times more specimens (348 specimens) than Ramey et al. (2005) across the same 5 subspecies of meadow jumping mice. King et al. (2006b, p. 4337) concluded that their microsatellite data demonstrated a strong pattern of genetic differentiation between the Preble's meadow jumping mouse and neighboring subspecies. King et al. (2006b, pp. 4336–4341) also reported that multiple statistical tests of the microsatellite data verified this differentiation.

In their evaluation of mtDNA, King et al. (2006b, p. 4341) examined approximately 4 times the number of base-pairs across 2 regions (374 control region and 1,006 cytochrome-B region base-pairs) and 1½ times more specimens (320 specimens for the control region analysis and 348 for the cytochrome-B analysis) than Ramey et al. (2005) across the same 5 subspecies of meadow jumping mice. King et al. (2006b, p. 4341) concluded that these data suggested strong, significant genetic differentiation among the five subspecies of meadow jumping mice surveyed. Additionally, their results indicated that the Preble's meadow jumping mouse did not share haplotypes with any neighboring subspecies (King et al. 2006b, p. 4341). Such haplotype sharing had led Ramey et al. to previously conclude that the Preble's meadow jumping mouse was not unique; specifically, Ramey et al. concluded that because all of the Preble's meadow jumping mouse haplotypes were found in *Z. h. campestris*, the Preble's meadow jumping mouse was a less genetically variable population of *Z. h. campestris*

(Ramey et al. 2004a, pp. 1, 9; 2005, p. 335). Because of these conflicting results, King et al. (2006b, pp. 4355–4357) reexamined 15 specimens from the University of Kansas Museum collection relied upon by Ramey et al. in determining that neighboring subspecies shared haplotypes. Among the specimens reported to contain the Preble's meadow jumping mouse's haplotypes by Ramey et al. (2005, pp. 335–336), King et al. (2006b, p. 4357) found that the results could not be repeated. If these specimens were removed from the analysis, neither study would illustrate haplotype sharing between the Preble's meadow jumping mouse and neighboring subspecies. King et al. (2006b, p. 4357) concluded that ''these findings have identified the presence of a systemic error in the control region data reported by Ramey et al. (2005)'' and ''calls into question all of the results of Ramey et al. (2005) based on the mtDNA genome and prevents analysis of the combined data.'' King et al. (2006, p. 4357) noted that possible reasons for the difference in sequences included contamination, mislabeling of samples, or other procedural incongruity.

Overall, King et al. (2006b, p. 19) concluded that there was considerable genetic differentiation among all five subspecies and found no evidence to support the proposal to synonymize the Preble's meadow jumping mouse, *Z. h. campestris*, and *Z. h. intermedius*.

Prior to its release, King et al. (2006a) underwent an internal peer review per USGS policy (U.S. Geological Survey 2003, pp. 3, 6, 12, 28–33). In an effort to provide consistent, comparable reviews, we solicited peer reviews from the same 16 reviewers asked to review Ramey et al. (2004a, 2004b). Nine of the experts provided comments (Armstrong 2006; Ashley 2006; Bradley 2006; Crandall 2006a; Douglas 2006; Hafner 2006; Maldonado 2006; Oyler-McCance 2006; Riddle 2006). Some of the most significant issues raised included the sampling regime and its impact on the analysis (Armstrong 2006; Ashley 2006; Crandall 2006a; Douglas 2006; Oyler-McCance 2006; Riddle 2006); and the criteria used and factors considered to test taxonomic validity and alternative interpretations of the data (Bradley 2006; Crandall 2006a).

Given the discrepancies between the Ramey et al. and King et al. reports, we contracted for a scientific review to analyze, assess, and weigh the reasons why the data, findings, and conclusions of the two studies differed (Service 2006, p. 14). Following an open and competitive bid process, we selected SEI as the contractor (Service 2006).

SEI assembled a panel of experts with the necessary scientific expertise in genetics and systematics (SEI 2006a, p. 7). The panelists reviewed, discussed, and evaluated all of the literature relevant to this issue, including published literature, unpublished reports, third-party critiques, and other materials suggested by interested parties (SEI 2006a, pp. 48–55). Additionally, the panel examined and reanalyzed the raw data (SEI 2006a, pp. 8, 21) used by Ramey et al. and King et al., including the mtDNA data, microsatellite DNA data, and original sequence chromatograms (automated DNA sequence data output recordings) (SEI 2006a, pp. 8, 23). The scientific review panel was open to the public and allowed for interactions among panel members, Dr. King, Dr. Ramey, other scientists, and the public.

In July 2006, SEI delivered a report outlining their conclusions to the Service (SEI 2006a). Although the panelists were not obligated to reach a consensus, they did not disagree on any substantive or stylistic issues (SEI 2006a, p. 9). Thus, the report represented the consensus of all three panelists, as well as the individual opinions of each panelist. The panel organized its evaluation into four sections corresponding with the different types of scientific evaluations performed, including morphology, ecological exchangeability, mtDNA, and microsatellite DNA. The panel's findings with regard to each are summarized briefly below. The full report is available for review at *http://www.fws.gov/mountain-prairie/species/mammals/preble/Prebles_SEI_report.pdf*.

Morphology: Although Ramey et al. (2005) examined two of the seven morphological characters identified by Krutzsch (1954, pp. 452–453), the panel found that all seven of these characters should have been reexamined in order to support the proposed taxonomic revision. The panel also concluded that the type specimen (a single specimen designated as the type by the original author at the time of publication of the original description of a taxon) of each taxon should have been included in the analysis. The panel's conclusion was that an insufficient test of the morphological definition of the Preble's meadow jumping mouse had been conducted to support the synonymy of the Preble's meadow jumping mouse with other subspecies (SEI 2006a, p. 41).

Ecological Exchangeability: The panel concluded that no persuasive evidence was presented regarding ecological exchangeability, and that the ecological exchangeability of the subspecies remains unknown (SEI 2006a, p. 41).

MtDNA: The panel noted that data provided by Ramey et al. (2005) and King et al. (2006b) differed in geographic sampling strategy, amount of sequence data examined, aspects of the analysis, and quality (SEI 2006a, p. 41). All of these could help explain why the two studies came to differing conclusions. However, the panel noted that the most significant difference between the two studies in terms of mtDNA was whether the Preble's meadow jumping mouse shared any mtDNA haplotypes with other subspecies of meadow jumping mice. Upon review of the raw data, the panel found evidence of contamination within some of the key sequences reported by Ramey et al. The panel concluded that there was no reliable evidence of any haplotype sharing (SEI 2006a, p. 42). The panel further determined that if these conflicting mtDNA sequences were removed from consideration, the two studies' mtDNA data would largely agree (SEI 2006a, p. 32). The panel also suggested that because the western jumping mouse and the meadow jumping mouse are distantly related, western jumping mouse may perform poorly as an outgroup, leading to poor resolution of relationships among meadow jumping mouse subspecies. While both Ramey et al. and King et al. used this outgroup, unrooted analysis showed clearer structuring between the subspecies (SEI 2006a, p. 42).

Microsatellite DNA: The panel found that the two microsatellite datasets contain similar information. The panel pointed out that both the Ramey et al. (2005) and King et al. (2006) microsatellite data, as well as Crandall and Marshall's (2006) reanalysis of these data, strongly support a statistically significant independent cluster that corresponds to the Preble's meadow jumping mouse, providing support for a distinct subspecies (SEI 2006a, pp. 42–43). The panel indicated that while the microsatellite data alone did not make a strong case for evolutionary significance, in concert with the mtDNA data (discussed above), the two datasets corroborate the distinctness of the Preble's meadow jumping mouse (SEI 2006a, pp. 43).

The panel's overall conclusion was that the available data are broadly consistent with the current taxonomic status of the Preble's meadow jumping mouse as a valid subspecies and that no evidence was presented that critically challenged its status (SEI 2006a, p. 4). In August 2006, Ramey et al. (2006c) submitted a statement to the Service disputing the findings and conclusions

of the SEI report. No new data or analyses were presented in this statement, and the panel previously considered most of the contentions (Ramey et al. 2003, 2004a, 2004b, 2005, 2006a, 2006b; SEI 2006a, 2006b, 2006c). Other evaluations of the available literature and data include Ramey et al. (in press), King et al. (in review), Crandall and Marshall (2006), Spencer (2006b), and Cronin (2007).

Taxonomic Conclusions

When listed in 1998, the Preble's meadow jumping mouse was widely recognized as a valid subspecies by the scientific community (Hall and Kelson 1959, pp. 771–774; Long 1965, pp. 664–665; Armstrong 1972, pp. 248–249; Whitaker 1972, pp. 1–2; Hall 1981, pp. 841–844; Jones et al. 1983, pp. 238–239; Clark and Stromberg 1987, p. 184; Wilson and Reeder 1993, p. 499; Hafner et al. 1998, pp. 120–121; Wilson and Ruff 1999, pp. 666–667). At the time of listing, Krutzsch (1954) represented the best available information on the taxonomy of the Preble's meadow jumping mouse (63 FR 26517, May 13, 1998). Our 1998 conclusion was consistent with Service regulations that require us to rely on standard taxonomic distinctions and the biological expertise of the Department and the scientific community concerning the relevant taxonomic group (50 CFR 424.11). However, when the best available science indicates that the generally accepted taxonomy may be in error, the Service must rely on the best available science (*Center for Biological Diversity, et al.*, v. *Robert Lohn, et al.*, 296 F. Supp. 2d. 1223 W.D. Wash. 2003). Such considerations led to our February 2, 2005, proposal to delist Preble's based upon information which questioned the subspecies' taxonomic validity (70 FR 5404).

We now determine the best scientific and commercial data available support the conclusion that the Preble's meadow jumping mouse is a valid subspecies. Specifically, the Preble's meadow jumping mouse's geographic isolation from other subspecies of meadow jumping mice (Krutzsch 1954, pp. 452–453; Long 1965, pp. 664–665; SEI 2006a, p. 34) has resulted in the accretion of considerable genetic differentiation (King et al. 2006b, pp. 4336–4348; SEI 2006a, pp. 41–43). The available data suggest that the Preble's meadow jumping mouse meets or exceeds numerous, widely accepted subspecies definitions (Mayr and Ashlock 1991, pp. 43–45; Patten and Unitt 2002, pp. 26–34; SEI 2006a, p. 44). In reaching this conclusion, we do not use a presumption that we must rely on the established taxonomy in the absence of conclusive data to the contrary (see SEI report at p. 39). In Therefore, after a review of all available information, we have determined that the taxonomic revision for the Preble's meadow jumping mouse suggested in our proposed delisting rule (70 FR 5404, February 2, 2005) is no longer appropriate.

Historical Range and Recently Documented Distribution

Generally, the Preble's meadow jumping mouse range includes portions of the North Platte, the South Platte, and the Arkansas River basins (Long 1965, p. 665; Armstrong 1972, pp. 248–249; Clark and Stromberg 1987, p. 184; Fitzgerald et al. 1994, p. 293; Clippinger 2002, p. 20).

At the time of listing, we described the historical range in Wyoming as including five counties (Albany, Laramie, Platte, Goshen, and Converse), but cited only two sites with recent reports of jumping mice likely to be the Preble's meadow jumping mouse. We cited a study by Compton and Hugie (1993, p. 6) suggesting the subspecies might be extirpated in Wyoming and comments by the Wyoming Game and Fish Commission that the Preble's meadow jumping mouse had likely been extirpated from most or all of its historical range in Wyoming (Wichers 1997).

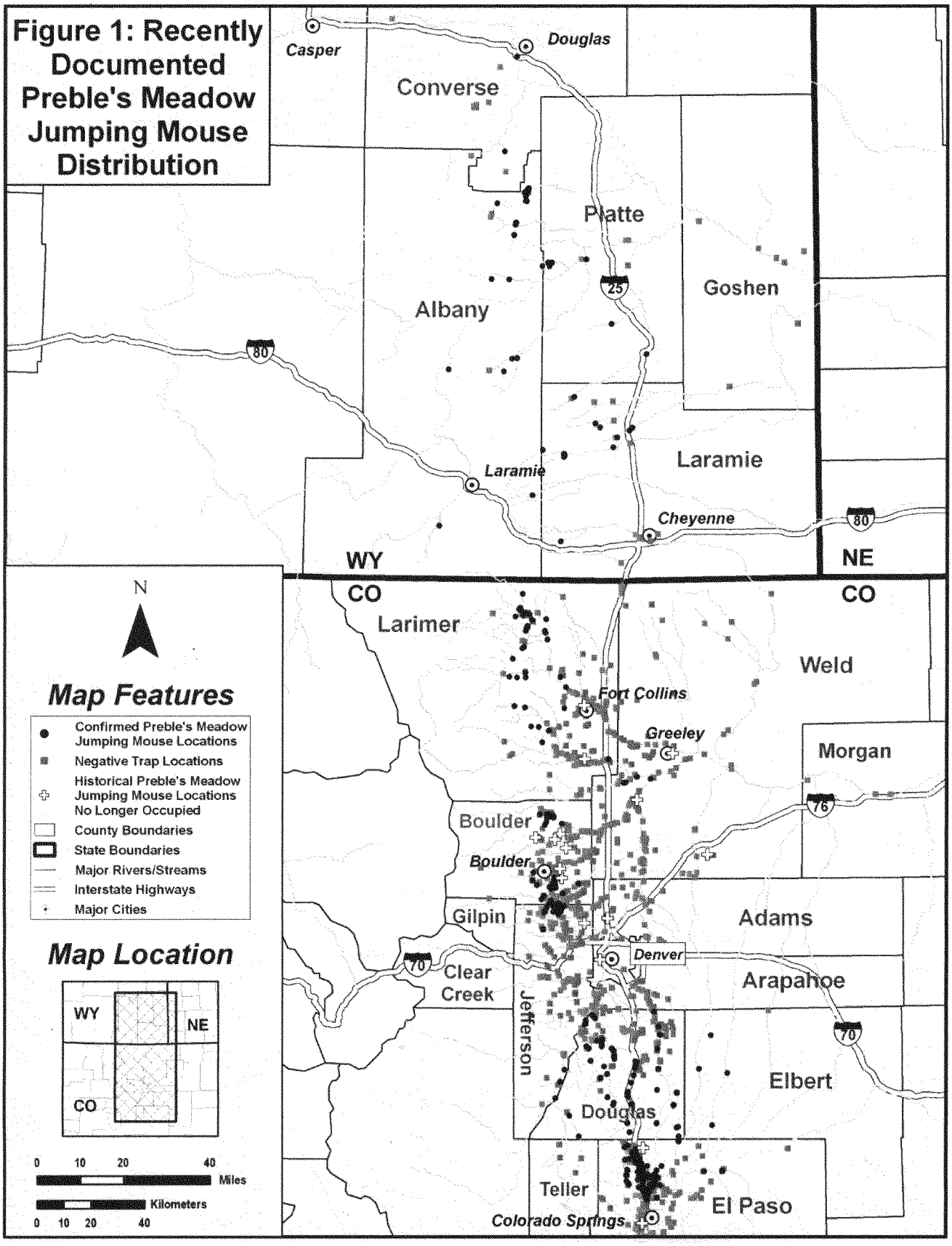
At the time of listing, we assumed that most of the subspecies' current range was in Colorado. Within Colorado, the final listing rule described a presumed historical range including portions of ten counties (Adams, Arapahoe, Boulder, Denver, Douglas, El Paso, Elbert, Jefferson, Larimer, and Weld) and cited recent trapping efforts that documented the subspecies in seven of these ten counties (Boulder, Douglas, El Paso, Elbert, Jefferson, Larimer, and Weld).

Since we listed the Preble's meadow jumping mouse in 1998, knowledge about distribution of the subspecies has grown substantially. Numerous trapping surveys conducted during the last 9 years in Wyoming and Colorado have documented the subspecies' presence or likely absence at locations of suitable habitat. While many recent trapping efforts have been at locations with no record of historical surveys, most have been within the presumed historical range of the Preble's meadow jumping mouse or in adjacent drainages where habitat and elevation appeared suitable. Thus, the recent increase in sites of Preble's meadow jumping mouse occurrence likely represents an improvement in our understanding of the subspecies range as a result of increased trapping effort rather than any actual expansion of the range of the Preble's meadow jumping mouse.

In Wyoming, recent captures and confirmed identification have expanded our knowledge of the distribution of the Preble's meadow jumping mouse from the two sites documented at the time of listing to include over two dozen new plains, foothills, and montane sites east of the Laramie Mountains in the North Platte River basin, and presence in the Upper Laramie River drainage in Albany County (Taylor 1999; Service 2007). Post-listing activities have identified many additional sites occupied by the subspecies. These data also reveal that the Preble's meadow jumping mouse occurs in four of the five counties described as the likely historical range at the time of listing including Albany, Laramie, Platte, and Converse Counties.

At the time of listing, we discussed how increased trapping efforts in Colorado had recently documented distribution in Elbert, Larimer, and Weld Counties. We also suggested other sites where trapping should occur to determine if the Preble's meadow jumping mouse were present. Additional trapping since listing has expanded the documented distribution of the Preble's meadow jumping mouse in Colorado to include: additional foothill and montane sites along the Front Range in Larimer, Boulder, Jefferson, and Douglas Counties; previously untrapped rural prairie and foothill streams in southern Douglas County and adjacent portions of Elbert County; and additional prairie and foothill streams in northwestern El Paso County. Although we have identified some additional sites occupied by the Preble's meadow jumping mouse, over 80 percent of such trapping efforts throughout Colorado have failed to capture Preble's meadow jumping mice (as illustrated in Figure 1 below) (Service 2007).

BILLING CODE 4310–55–P



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These negative trap results suggest that the subspecies is rare or possibly extirpated from many portions of the subspecies' historical range in Colorado.

Areas where the subspecies is presumed extirpated is discussed in the Factor A discussion below.

The Preble's meadow jumping mouse has now been recently documented in portions of Albany, Laramie, Platte, and Converse Counties in Wyoming; and in portions of Boulder, Douglas, El Paso, Elbert, Jefferson, Larimer, and Weld Counties in Colorado (Figure 1). The North Platte River at Douglas, Wyoming, marks the northernmost confirmed location for the Preble's meadow jumping mouse. Specimens from Colorado Springs, Colorado, mark the southernmost documented location of the Preble's meadow jumping mouse.

The Preble's meadow jumping mouse is generally found at elevations between 1,420 m (4,650 ft) and 2,300 m (7,600 ft), although elevations vary across the range of the subspecies. At the lower end of this elevation gradient, the semi-arid climate of southeastern Wyoming and eastern Colorado limits the extent of riparian corridors and restricts the range of the Preble's meadow jumping mouse (Beauvais 2001, p. 3). The Preble's meadow jumping mouse is likely an Ice Age relic; once the glaciers receded from the Front Range of Colorado and the foothills of Wyoming and the climate became drier, the Preble's meadow jumping mouse was confined to riparian systems where moisture was more plentiful (Fitzgerald *et al.* 1994, p. 1994; Smith *et al.* 2004, p. 293). The eastern boundary for the subspecies is likely defined by the dry shortgrass prairie, which may present a barrier to eastward expansion (Beauvais 2001, p. 3). In Wyoming, the Preble's meadow jumping mouse has not been found east of Cheyenne, Laramie County (Beauvais 2001, p. 3). Habitat modeling and trapping suggest the subspecies may not occur in Wyoming's Goshen, Niobrara, and eastern Laramie Counties (Keinath 2001, p. 7). In Colorado, the Preble's meadow jumping mouse has not been found on the extreme eastern plains (Clippinger 2002, pp. 20–21).

At the higher elevations, discerning the status of the Preble's meadow jumping mouse is complicated by the overlap in the ranges of the Preble's meadow jumping mouse and the western jumping mouse (Long 1965, pp. 665–666; Clark and Stromberg 1987, pp. 184–187; Schorr 1999, p. 3; Bohon *et al.* 2005; Schorr *et al.* 2007, p. 5). Field differentiation between the Preble's meadow jumping mouse and the western jumping mouse is difficult (Conner and Shenk 2003a, p. 1456). Generally, the western jumping mouse occurs in the montane and subalpine zones and the Preble's meadow jumping mouse occurs lower, in the plains and foothills (Smith *et al.* 2004, p. 10). Using this as a guide, many jumping mice were trapped and released without being conclusively identified as either a Preble's meadow jumping mouse or a western jumping mouse. Because western jumping mice have been verified at elevations well below the upper elevation limit of the Preble's meadow jumping mouse (Smith *et al.* 2004, p. 11), this leads to difficulty in making assumptions regarding identification based on elevation. Drainages where overlapping ranges have been verified include the Glendo Reservoir, Lower Laramie, Upper Laramie, and Horse Creek drainages in Wyoming (Conner and Shenk 2003b, pp. 31–35; Meaney 2003; King 2006a; King 2006b; King *et al.* 2006b, pp. 4351–4353); and the Cache La Poudre, Big Thompson, and Upper South Platte River drainage in Colorado (Bohon *et al.* 2005; King 2005; King 2006a; King *et al.* 2006b, pp. 4351–4353; Schorr *et al.* 2007).

Size, external morphology, dentition, skull measurements, and genetic analysis can all be used to differentiate meadow jumping mice (including the Preble's meadow jumping mouse) from western jumping mice (Krutzsch 1954, pp. 351–384; Klingenger 1963, p. 252; Riggs *et al.* 1997, pp. 2–8; Conner and Shenk 2003a; Ramey *et al.*; King *et al.*). The following description of the Preble's meadow jumping mouse's current documented distribution and status is based primarily on individuals positively identified as Preble's meadow jumping mice, with emphasis on locations where individual mice have been identified by genetic analysis or discriminant function analysis (DFA) (analysis of cranial measurements and an anterior medial toothfold characteristic) (Conner and Shenk 2003a). Information regarding individual mice and capture locations can be found in Riggs *et al.* (1997, pp. 8–11, A2–A5), Conner and Shenk (2003b, pp. 31–35), and King *et al.* (2006b, pp. 4351–4353). Positive identification of individual mice is most important in areas where both the Preble's meadow jumping mouse and the western jumping mouse occur. Overlap appears to occur in most of Wyoming's occupied drainages. In Colorado, with few exceptions, jumping mice below 2,050 m (6,700 ft) have been positively identified as Preble's meadow jumping mice. Above 2,050 m (6,700 ft) in Colorado, Preble's meadow jumping mice and western jumping mice are known to have an overlapping distribution in the Cache La Poudre, Big Thompson, and Upper South Platte River drainages.

Below is a summary of recent (since 1980) trapping data by drainage (as defined by 8-digit USGS hydrologic units), within both Wyoming (e.g., the North and South Platte River basins) and Colorado (e.g., the South Platte River and Arkansas River basins). Although trapping data is important because it absolutely confirms the occurrence of jumping mice at particular locations, as discussed in detail below, trapping data is one of several lines of evidence we use to estimate the actual current range of the subspecies. Records have been compiled by the Service (2007) in coordination with the Wyoming Natural Diversity Database, State of Wyoming, and CDOW. In addition, Figure 1 above illustrates all recent Preble's meadow jumping mouse specimens, historical (pre-1980) locations no longer believed to be occupied, and recent negative trapping efforts. Given wide areas of overlapping range in Wyoming, we require all Wyoming specimens to be confirmed as Preble's meadow jumping mice in order to be considered below. In Colorado, jumping mice are considered Preble's meadow jumping mice when identification is confirmed or if they occur in areas where western jumping mice are not known.

North Platte River Basin, Wyoming. In the North Platte River basin, occurrence of the Preble's meadow jumping mouse has been confirmed in four Wyoming counties (Converse, Platte, Albany, and Laramie) as reported by drainage below.

The Middle North Platte drainage represents the northern extent of the reported Preble's meadow jumping mouse range; however, trapping surveys have been quite limited and generally at high elevations. Although several jumping mice have been trapped in this drainage, these specimens have not been confirmed as Preble's meadow jumping mice.

In the Glendo Reservoir drainage, the Preble's meadow jumping mouse is known from several locations, including along the North Platte River at Douglas (King 2006b), Cottonwood Creek and its tributaries (Meaney 2003; King 2006a; King 2006b; King et al. 2006b), and the Horseshoe Creek area (Krutzsch 1954, p. 453). While the western jumping mouse has also been confirmed from the Glendo Reservoir drainage, the Preble's meadow jumping mouse appears more common.

In the Lower Laramie drainage, the Preble's meadow jumping mouse has been confirmed from the Laramie River and its tributaries, including the North Laramie River, and Sturgeon, Wyman,

Rabbit, and Luman Creeks; as well as several locations along Chugwater Creek and its tributaries (King 2006b; King et al. 2006b). Both Preble's meadow jumping mice and western jumping mice occur in the Sybille Creek, Friend Creek and the Friend Park areas (Conner and Shenk 2003b; King 2006a; King 2006b; King et al. 2006b). The Lower Laramie drainage appears to support coexisting Preble's meadow jumping mice and western jumping mice in multiple locations.

In the Horse Creek drainage, the Preble's meadow jumping mouse has been widely documented west of Interstate Highway 25 (I–25) and at one site east of I–25. The majority of these recent captures have been made in Bear Creek and its tributaries, and in headwaters of Horse Creek and its tributaries. Both Preble's meadow jumping mice and western jumping mice inhabit multiple sites on both creeks (Conner and Shenk 2003b; Meaney 2003; King 2006b; King et al. 2006b).

In the Upper Laramie drainage, the Preble's meadow jumping mouse has been confirmed at Hutton Lake National Wildlife Refuge (NWR) and from a site north of Laramie (Meaney 2003). Other specimens at these same sites have been confirmed as western jumping mice (Meaney 2003; King 2006a). Therefore, it appears both Preble's meadow jumping mice and western jumping mice are present in this drainage. Based on positive identification of the Preble's meadow jumping mouse from the sites mentioned above, Smith et al. (2004, p. 12) suggested the range of the Preble's meadow jumping mouse may extend into the Upper Laramie River, Little Laramie River, Rock Creek, and possibly the Medicine Bow River.

South Platte River Basin, Wyoming. Within the Wyoming portion of the South Platte River basin, trapping efforts have confirmed Preble's meadow jumping mouse occurrence, albeit possibly in low numbers, within two drainages in Laramie and Albany Counties.

In the Upper Lodgepole drainage, jumping mice have been found from several locations at and upstream of Highway 211. While at least one Preble's meadow jumping mouse has been confirmed (Riggs et al. 1997), most of the captured mice have been identified as western jumping mice (Meaney 2003; King 2006a). Therefore, while this drainage supports the Preble's meadow jumping mouse, its distribution may be limited.

Although historically reported from the Crow Creek drainage at Cheyenne, Preble's meadow jumping mouse occurrence in this drainage remains uncertain. Specimens from Warren Air Force Base were assumed to be Preble's meadow jumping mice based on the elevation of 1,900 m (6,150 ft), but subsequent analyses identified only western jumping mice (Riggs et al. 1997; Conner and Shenk 2003b; King 2006a). The only trapping evidence confirming Preble's meadow jumping mouse occurrence in this drainage comes from a specimen from the South Crow Creek Reservoir area originally identified as a western jumping mouse by the DMNS and then re-identified as a Preble's meadow jumping mouse based on a DFA analysis considering dental characteristics (Meaney 2003). Additional specimens have only verified western jumping mice from Middle Crow Creek, the South Fork of Middle Crow Creek, and South Crow Creek Reservoir (Meaney 2003; King 2006a). No jumping mice have been reported trapped downstream of Cheyenne.

The Lone Tree Creek drainage was previously assumed to be inhabited by the Preble's meadow jumping mouse based on the field identification of low elevation captures of jumping mice (1,900 m (6,200 ft)). However, DFA analysis of existing museum specimens (Conner and Shenk 2003b) and genetic analysis of specimens obtained from trapping efforts (Riggs et al. 1997; King 2006a), have only confirmed presence of western jumping mice in this drainage.

South Platte River Basin, Colorado. Recent presence of the Preble's meadow jumping mouse in Colorado has been documented within the South Platte River basin in seven counties: Larimer, Weld, Boulder, Jefferson, Douglas, Elbert, and El Paso. From the Wyoming State line south through the Denver area, little recent documentation of the Preble's meadow jumping mouse exists from sites east of the foothills where most of the subspecies' historical recordings occurred. This area largely corresponds to the Front Range urban corridor, an area experiencing continued human population growth and development (Clippenger 2002, pp. 22–26; Colorado Demography Office 2007). At higher elevation plains and foothills sites south of the Denver area, the Preble's meadow jumping mouse has been documented at a number of locations where riparian habitats are still largely intact. With rare exception, all jumping mouse records verified below 2,050 m (6,700 ft) in the South Platte River drainage of Colorado have been Preble's meadow jumping mice.

In the Cache La Poudre River drainage, jumping mice have been documented on sites upstream of Fort Collins, Larimer County, at elevations consistent with known Preble's meadow jumping mouse distribution. These sites include the main stem Cache La Poudre River and its tributaries, including Young Gulch and Stove Prairie Creek, and the North Fork Cache La Poudre River and its tributaries, including Stonewall, Rabbit, and Lone Pine Creeks. Shenk and Eussen (1999, pp. 11–12) cautioned that both Preble's meadow jumping mice and western jumping mice were likely present in some of these areas. Subsequent genetic analysis confirmed both Preble's and the western jumping mouse in Cherokee Park at 2,260 m. (7,480 ft) (King 2005, 2006b), but only Preble's meadow jumping mice have been confirmed from lower elevations, including Rabbit and Lone Pine Creeks, the Livermore Mountain area, and the North Fork of the Cache La Poudre River (Riggs et al. 1997; King et al. 2006b). Despite a number of trapping efforts, no jumping mice have been recently documented within the Fort Collins, Larimer County, area or downstream on the Cache La Poudre River to its confluence with the South Platte River at Greeley, Weld County (Service 2007).

Within the Big Thompson drainage, the Preble's meadow jumping mouse has been documented in foothills sites along Buckhorn Creek and certain of its tributaries, and on Dry Creek, in Larimer County. Genetic analysis of mice from three tributaries of Buckhorn Creek up to 2,240 m (7,360 ft) support identifications as Preble's meadow jumping mice; however, both Preble's meadow jumping mice and western jumping mice were confirmed from the Lakey Canyon site at 2,170 m (7,120 ft) and a mouse from the North Fork of the Big Thompson River at 2,170 m (7,120 ft) was identified as a western jumping mouse (King 2006a). Despite a number of trapping efforts, the Preble's meadow jumping mouse has not been documented on the Big Thompson and Little Thompson Rivers through the Front Range urban corridor, but has been found on both rivers east of I–25, in Weld County.

In the Saint Vrain drainage, the Preble's meadow jumping mouse has been documented along the Saint Vrain River, its tributaries and water conveyance ditches upstream of the town of Hygiene, on two tributaries of Boulder Creek west of the City of Boulder, and along South Boulder Creek, all in Boulder County; and on upper reaches of Coal and Rock Creeks, Jefferson County. On Rocky Flats NWR, Jefferson County, the Preble's meadow jumping mouse has been documented on Rock Creek as well on nearby Walnut

and Woman Creeks (within the Middle South Platte-Cherry Creek drainage). Several of these locations include mice confirmed as Preble's meadow jumping mice by genetic analysis or DFA (Riggs et al. 1997; Conner and Shenk 2003b). The Preble's meadow jumping mouse occurrence has not been confirmed by trapping efforts along eastern parts of the drainage, the Saint Vrain River from Hygiene, Boulder County, downstream to its confluence with the South Platte River, along Boulder Creek from the City of Boulder east to its confluence with the Saint Vrain River, or downstream of Rocky Flats NWR on Walnut, Woman, or Dry Creeks.

In the Clear Creek drainage, the Preble's meadow jumping mouse has been verified in the foothills on Ralston Creek (Riggs et al. 1997), and unidentified jumping mice have been captured on two tributaries of Clear Creek at elevations of potential Preble's meadow jumping mouse occurrence (below 2,300 m (7,600 ft)). No jumping mice have been captured on either creek downstream through the urban corridor to the South Platte River.

In the Upper South Platte drainage, the Preble's meadow jumping mouse has been documented immediately upstream of Chatfield Reservoir on the South Platte River, and also well upstream on the South Platte River and its tributaries in Jefferson and Douglas Counties to near the Teller County-Douglas County line. The U.S. Forest Service provided a summary of Preble's meadow jumping mouse trapping efforts at 15 sites in the Upper South Platte drainage in the Pike National Forest. Based on examination of voucher specimens, Preble's meadow jumping mice were confirmed at six sites up to 2,300 m (7,600 ft) and western jumping mice were confirmed from six sites, the lowest of which, at 2,030 m (6,660 ft), was lower than five Preble's meadow jumping mouse sites (Bohon et al. 2005). Schorr et al. (2007) also summarized co-occurrence of Preble's and the western jumping mouse in the same area. Also in the Upper South Platte drainage, the Preble's meadow jumping mouse has been widely documented upstream of Chatfield Reservoir on Plum Creek, including occurrences on East Plum Creek, West Plum Creek, and various tributaries, all in Douglas County (Riggs et al. 1997; Conner and Shenk 2003b; King et al. 2006b). Western jumping mice have also been identified in this drainage at 1,800 m (5,900 ft) and 1,950 m (6,400 ft) (Conner and Shenk 2003b). Pague and Schuerman (1998, p. 5) assessed Preble's meadow jumping mouse habitat throughout the Plum Creek watershed, randomly trapped suitable habitat, and estimated 64 km (40 mi) of streams occupied by the Preble's meadow jumping mouse. On the downstream portion of this drainage, below Chatfield Reservoir, there is no recent documentation of Preble's meadow jumping mouse's presence on the South Platte River through Denver.

In the Middle South Platte, Cherry Creek drainage, Preble's meadow jumping mice have been found on Cherry Creek and its tributaries from approximately the Arapahoe County-Douglas County line, upstream to the headwaters of East and West Cherry Creeks near the Palmer Divide in El Paso County. Also within Middle South Platte-Cherry Creek drainage, limited trapping efforts have documented the Preble's meadow jumping mouse on Running Creek and a tributary, Hay Creek, in Elbert County. Based on limited genetic analysis and DFA, western jumping mice have not been confirmed from this drainage. The Preble's meadow jumping mouse occurrence has not been confirmed by trapping downstream along Cherry Creek through Arapahoe County and Denver to the South Platte River. Because of numerous negative trapping efforts and lack of contiguous suitable habitat, we no longer consider the greater Denver area (including most of Denver County and portions of Adams, Arapahoe, Boulder, Broomfield, Douglas, and Jefferson Counties) to be occupied. On the South Platte River downstream from the Denver area, a single Preble's meadow jumping mouse was recently captured from near the South Platte River in Milliken, Weld County, not far from the confluence of the Big Thompson River and South Platte River (Savage and Savage 2001).

Farther east, there are two records of a Preble's meadow jumping mice on Kiowa Creek, Elbert County. Additional trapping in Elbert County would be useful to document whether the Preble's meadow jumping mouse is present along significant reaches of the Middle South Platte-Cherry Creek and Kiowa Creek drainages, and on the Bijou Creek drainage, Elbert County, which has not been trapped.

Arkansas River Basin, Colorado. In the Arkansas River basin, confirmed current occurrence of the Preble's meadow jumping mouse is limited largely to the Fountain Creek drainage and specifically to Monument Creek and its tributaries north of Colorado Springs. Genetic analysis and DFA have thus far confirmed no western jumping mice from within the Preble's meadow jumping mouse's range in this drainage (Conner and Shenk 2003b; King et al. 2006b). The Preble's meadow jumping mouse has been well studied at the U.S. Air Force Academy (Academy) on Monument Creek and its tributaries, and has been documented farther upstream on Monument Creek and on tributaries to the east and north toward the Palmer Divide. Numerous records of Preble's meadow jumping mouse captures on streams in northwestern El Paso County are the result of extensive trapping that has taken place in conjunction with proposed development projects. Downstream of the Academy, numerous trapping surveys indicate that the Preble's meadow jumping mouse has little likelihood of occurrence along Monument Creek through the downtown portions of Colorado Springs. Similarly, extensive trapping surveys suggest that the Preble's meadow jumping mouse may be extirpated from Cottonwood Creek and its tributaries.

In the Chico Creek drainage, jumping mice (assumed to be Preble's meadow jumping mice as explained above) have been documented on the upper reaches of Black Squirrel Creek and on a tributary, both in El Paso County. Limited trapping efforts in potential Preble's meadow jumping mouse habitat farther to the east in the Chico Creek drainage and in the Big Sandy Creek drainage have not confirmed Preble's meadow jumping mouse occurrence. Downstream, to the east and south, these drainages appear to have little habitat suitable for the Preble's meadow jumping mouse.

Within the Arkansas River basin south of the documented Preble's meadow jumping mouse locations, trapping efforts targeting the Preble's meadow jumping mouse conducted in southern El Paso County, Pueblo County, and Fremont County, including surveys funded and carried out by the Department of the Army at Fort Carson, have not resulted in capture of jumping mice (Bunn et al. 1995; Werner 2003).

In conclusion, the Preble's meadow jumping mouse appears to be widespread in the North Platte River basin were trapping efforts confirm the subspecies' distribution across at least four drainages. The Preble's meadow jumping mouse appears scarce within the Wyoming portion of the South Platte River basin, where trapping efforts to date provide few confirmed occurrences of the subspecies and suggest that the western jumping mouse is much more widespread. Trapping efforts within the Colorado portion of the South Platte River Basin indicate the Preble's meadow jumping mouse has little likelihood of occurrence in portions of some drainages that coincide with the

Front Range development corridor (areas around I–25 from Fort Collins south through the Denver metropolitan area), is more widespread in foothills and some montane areas within these same drainages, and generally present in rural portions of drainages south of Denver. In the Arkansas River basin in Colorado, Preble's meadow jumping mouse distribution appears very limited, with trapping efforts confirming occurrence largely in upper Monument Creek and some headwater tributaries.

Data limitations, such as limited trapping data, do not allow us to equate documented distribution with range. For example, the subspecies has been documented in several places along Hay Creek in Elbert County, and it is reasonably likely to occur further downstream in Arapahoe County, but no trapping has occurred to confirm or deny this assertion (See figure 1). Similarly, on Trout Creek a Preble's meadow jumping mouse was found in Douglas County near the Teller County line and it is reasonable to assume the subspecies may also occur in Teller County. Given the data limitations, ''range'' (relative to the March 14, 2007, Department of the Interior, Solicitor Memorandum opinion) is defined in the Conclusion of the 5-Factor Analysis section of this rule below.

Abundance

Intensive trapping studies designed to estimate populations of the Preble's meadow jumping mouse have occurred on only a few sites. Because not all appropriate habitat has been surveyed for Preble's meadow jumping mouse occurrence and because population estimates are available for only a few selected sites, no regional, Statewide, or rangewide population estimates for the Preble's meadow jumping mouse have been developed. Population density and trends are not well known in Wyoming (Wyoming Game and Fish Department 2005, p. 36). There are a few population estimates but little trend information for Preble's meadow jumping mouse populations in Colorado. In addition, because jumping mouse populations in a given area vary significantly from year to year (Quimby 1951, pp. 91–93; Whitaker 1972, p. 4), short-term studies may not accurately characterize abundance. In an ongoing trapping study, population highs of 24 Preble's meadow jumping mice per site were estimated for two control sites in 1998 and 1999; subsequent trapping in 2002, during regional drought conditions, estimated no Preble's meadow jumping mice present at either site (Bakeman 2006, p. 11). Meaney et al. (2003, p. 620) estimated Preble's meadow jumping mouse populations on study sites over 4 years, noted absence of the Preble's meadow jumping mouse at certain sites during some seasons, and suggested that 10 or more years of study might be necessary to assess the full extent of population variation.

White and Shenk (2000, p. 9) summarized abundance estimates from nine sites in Colorado for field work conducted during 1998 and 1999 (Meaney et al. 2000; Kaiser-Hill 2000; Ensight Technical Services 1999, 2000, 2001; Shenk and Sivert 1999b; Schorr 2001). Since Preble's meadow jumping mice are found in linear riparian communities, abundances were estimated in number of individuals per km (or mi) of stream corridor. Estimates of linear abundance ranged widely, from 4 to 67 mice/km (6 to 107 mice/mi) with a mean of 33 +/− 5 mice/km (53 +/− 8 mice/mi) (White and Shenk 2000, p. 9). The subsequent addition of new sites and 2 more years of data (2000–2001) provided a range of 2 to 67 mice/km (3 to 107 mice/mi) and a mean of 27 +/− 4 mice/km (44 +/− 6 mice/mi) (Shenk 2004).

The above estimates, coupled with sufficient knowledge of occupied stream miles, can provide a rough indicator of Preble's meadow jumping mouse numbers within a stream reach or drainage. For example, the Preble's meadow jumping mouse Recovery Team used the above estimate (Shenk 2004) to approximate stream miles required to support varying sized populations of the Preble's meadow jumping mouse (Service 2003b, p. 25). Hayward (2002) cautioned that reliance on an average number of mice per length of stream to predict population sizes would result in the overestimation of actual population size for about half of all sites. Of additional concern in any assessment of Preble's meadow jumping mouse population size is the potential for including western jumping mice in the estimate (Bohon et al. 2005; Schorr et al. 2007, p. 4). This is of particular importance in areas where both Preble's meadow jumping mice and western jumping mice are known to occur, including higher elevation Colorado sites and at most sites in Wyoming.

Another potential source of error is that the Preble's meadow jumping mouse population estimates above do not include estimates for riparian corridors along mountain streams or any sites in Wyoming. In Pike National Forest, Colorado, site inspection of many streams previously mapped as Preble's meadow jumping mouse habitat revealed poorly developed or intermittent riparian vegetation surrounded by sparse uplands dominated by pine forest (Bohon et al. 2005). Poor trapping success even in suitable habitat suggested low population densities in Pike National Forest compared to those at lower elevations (Bohon et al. 2005; Hansen 2006, p. 168). In studies targeting the Preble's meadow jumping mouse at 11 higher elevations (1,890 to 2,420 m (6,200 to 7,940 ft)) riparian sites in Douglas, Jefferson, and Teller Counties, Schorr et al. (2007, p. 4) reported a 0.6 percent capture rate of jumping mice over 19,500 trap nights. Since coexistence of both the Preble's meadow jumping mouse and the western jumping mouse was confirmed in these studies, the capture rate of the Preble's meadow jumping mouse was probably much lower. In comparable trapping effort in high quality habitat at lower elevations, Schorr (2001, p.18) reported a 3.5 percent capture rate of Preble's meadow jumping mice over 14,700 trap nights at the Academy, and Meaney et al. (2003, p. 616) reported a 3.4 percent capture rate of Preble's meadow jumping mice over 21,174 trap nights along South Boulder Creek, Boulder County. We believe that more research is needed before conclusions can be drawn regarding Preble's meadow jumping mouse abundance and security along montane streams and headwaters.

Trends

Without comprehensive population estimates for the subspecies, the only basis for trend assessment is presence or absence surveys in historical habitat (Smith et al. 2004, p. 29). This presence/absence information paints a very different picture for Wyoming compared to Colorado.

In Wyoming, we now have much more information regarding Preble's meadow jumping mouse distribution than we had at time of listing, when we described only two occupied sites. Much of what we noted in the listing to be historical range of the Preble's meadow jumping mouse in Wyoming has now been definitively found to support Preble's. But, while many jumping mice have been confirmed as Preble's meadow jumping mice in the North Platte River basin, the subspecies appears uncommon in the South Platte River basin, with only western jumping mice previously confirmed at several locations believed to be within Preble's meadow jumping mouse range.

In Colorado, historical trapping records establish that the Preble's meadow jumping mouse was present in a range that included major plains streams from the base of the Colorado Front Range east to at least Greeley, Weld County (Armstrong 1972, p. 249;

Fitzgerald et al. 1994, p. 293, Clippenger 2002, p. 18). Recent trapping efforts have documented that the Preble's meadow jumping mouse is rare or, perhaps, absent from these same areas today (Ryon 1996, p. 2; Clippinger 2002, p. 22; Service, 2007). This pattern is especially apparent along prairie riparian corridors directly or indirectly impacted by human development. This issue is discussed further in Factor A below.

Summary of Factors Affecting the Subspecies

Section 4 of the Act and its implementing regulations (50 CFR part 424) set forth the procedures for listing, reclassifying, or removing species from listed status. ''Species'' is defined by the Act as including any species or subspecies of fish or wildlife or plants, and any distinct vertebrate population segment of fish or wildlife that interbreeds when mature (16 U.S.C. 1532(16)). Once the ''species'' is determined we then evaluate whether that species may be endangered or threatened because of one or more of the five factors described in section 4(a)(1) of the Act. We must consider these same five factors in delisting determinations. Under 50 CFR 424.11(d), we may remove the protections of the Act if the best available scientific and commercial data substantiate that the species is neither endangered nor threatened for the following reasons: (1) the species is extinct; (2) the species has recovered and is no longer endangered or threatened; or (3) the original scientific data used at the time the species was classified were in error. Data error only applies when subsequent investigations show that the best scientific or commercial data available when the species was listed, or the interpretation of such data, were in error.

We may delist a species for any of the above reasons only if such data substantiate that the species is neither endangered nor threatened. Determining whether a species meets these definitions requires consideration of the same five categories of threats specified in section 4(a)(1) of the Act. For species that are already listed as endangered or threatened, this analysis of threats is an evaluation of both the threats currently facing the species and the threats that are reasonably likely to affect the species in the foreseeable future following the delisting or downlisting and the removal or reduction of the Act's protections.

Under section 3 of the Act, a species is ''endangered'' if it is in danger of extinction throughout all or a ''significant portion of its range'' and is ''threatened'' if it is likely to become endangered within the foreseeable future throughout all or a ''significant portion of its range.'' The word ''range'' in the phrase ''significant portion of its range'' refers to the range in which the species currently exists. Range is discussed further in the Conclusion of the 5-Factor Analysis section of this proposal below.

For the purposes of this analysis, we will evaluate whether the currently listed subspecies is threatened or endangered. This determination is a multiple-step analysis. If we determine that the subspecies is endangered throughout all of its range, we list it as endangered throughout its range and no further analysis is necessary. If not, we then evaluate if the subspecies meets the definition of threatened throughout all of its range. If the subspecies is threatened in all of its range, we list as threatened and consider if any significant portions of the range warrants consideration as endangered. If we determine that the subspecies is not threatened or endangered in all of its range, we consider whether any significant portions of the subspecies' range warrant consideration as threatened or endangered. We would then only list that significant portion of its range as threatened or endangered and not list the remaining portion of its range.

Foreseeable future is determined by the Service on a case-by-case basis, taking into account a variety of species-specific factors such as lifespan, genetics, breeding behavior, demography, threat-projection timeframes, and environmental variability. For the purposes of this proposal, we define foreseeable future based upon a threat-projection timeframe because future development intensity and patterns are likely to be the single greatest factor contributing to the subspecies' future conservation status. As described in more detail below, human-population-growth projections extend out to 2035 in Colorado and 2036 in Wyoming. Similarly, water requirements are estimated through 2030 in Colorado and 2035 in Wyoming. A Center for the West model predicting future land-use patterns projects development changes within the range of Preble's through 2040. Such projections frame our analysis as they help us understand what factors can reasonably be anticipated to meaningfully affect the subspecies' future conservation status. In our view, the foreseeable future for this subspecies, based on the currently available data, does not extend beyond 2040. While it is likely some of the above estimates could be extrapolated out into the more distant future, development projections beyond this point are of increasingly lower value as uncertainty escalates.

The following analysis examines all five factors currently affecting, or that are likely to affect, the Preble's meadow jumping mouse within the foreseeable future.

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Introduction. Decline in the extent and quality of Preble's meadow jumping mouse habitat has been considered the primary factor threatening the subspecies (Bakeman 1997, p. 78; Hafner et al. 1998, p. 122; Pague and Grunau 2000). In our 1998 final rule to list Preble's meadow jumping mouse as threatened (63 FR 26517, May 13, 1998), we stated that Colorado east of the Front Range and adjacent areas of southeastern Wyoming had changed, over time, from predominantly prairie habitat intermixed with perennial and intermittent streams and associated riparian habitats to an agricultural and increasingly urban setting.

In our listing decision, we stated that Preble's meadow jumping mouse populations had experienced a decline and faced continued threats linked to widespread loss and fragmentation of the subspecies' required riparian habitat from human land uses including: urban, suburban, and recreational development; highway and bridge construction; water development; instream changes associated with increased runoff and flood control efforts; aggregate (sand and gravel) mining; and overgrazing (63 FR 26517, May 13, 1998). These human land-use activities affect the Preble's meadow jumping mouse by directly destroying its protective cover, nests, food resources, and hibernation sites; disrupting behavior; or acting as a barrier to movement. We noted that such impacts reduced, altered, fragmented, and isolated habitat to the point where Preble's meadow jumping mouse populations may no longer persist. We also noted that patterns of capture suggested that Preble's meadow jumping mouse populations fluctuate greatly over time at occupied sites, raising questions regarding security of the many currently documented populations which are isolated and affected by human development.

Historical records in Colorado (pre-1980) illustrate areas of Preble's meadow jumping mouse occupancy along the Front Range within both foothill and prairie riparian corridors

(Armstrong 1972, p. 249; Fitzgerald et al. 1994, p. 293). Between 1980 and 2005, the human population of Colorado counties within the Preble's meadow jumping mouse range increased by nearly 60 percent, from 1.7 million to 2.7 million (Colorado Demography Office, 2007). As explained further below, the apparent absence of the Preble's meadow jumping mouse in areas of substantial development, where trapping had previously confirmed subspecies presence, supports the conclusion that human land uses adversely affect Preble's meadow jumping mouse populations.

Ryon (1996) evaluated the condition of eight historical Preble's meadow jumping mouse capture sites in six Colorado counties based on vegetation structure, dominant plant species, and trapping results. Ryon reported no Preble's meadow jumping mouse captures at any of the seven sites trapped (one site no longer contained suitable habitat) (1996, p. 25). In addition, he reported that the historical sites contained fewer native species in plant communities and were lacking the multi-strata vegetation structure he observed at sites where trapping had recently confirmed Preble's meadow jumping mouse presence (Ryon 1996, p. 30). Investigations into land-use changes at the historical sites suggested that most had been directly altered in terms of habitat or had been influenced by habitat fragmentation (Ryon, 1996, p. 30). Clippinger (2002, pp. 14–29) mapped and compared past (through 1972) and current (post-1972) distribution records of the Preble's meadow jumping mouse in central Colorado and southeastern Wyoming based on museum specimens, published accounts, and unpublished reports. Clippinger reported that his distribution maps illustrated a loss of Preble's populations in expanding urban and suburban areas, especially around Cheyenne, Denver, and Colorado Springs, and in general along the eastern extent of historical range (Clippinger 2002, p. 22). Note that Clippinger's reference to historical range is based on the few existing records (through 1972) documenting Preble's meadow jumping mouse occurrence. These records are focused around what is now the I–25 urban corridor and based upon our current knowledge of the subspecies do not truly represent the extent of the range of the subspecies. The apparent loss of historically occupied sites (those sites where the subspecies was documented to occur prior to 1980) also provides some insight into this relationship. Based on Service records, consisting of intensive trapping efforts and assessments of habitat quality, only 1 of 17 of these documented historical sites of Preble's meadow jumping mouse occurrence in Colorado (Bear Creek, Boulder County) is thought to currently support the Preble's meadow jumping mouse.

Recent trapping records maintained by the Service indicate that Preble's meadow jumping mouse populations have little likelihood of occurrence along large portions of major river and stream reaches within the subspecies' historical described range in Colorado including:

- The Cache La Poudre River within Fort Collins and downstream to its confluence with the South Platte River at Greeley, 60 km (37 mi);
- The Big Thompson River and Little Thompson River through the Front Range urban corridor, approximately 50 km (32 mi);
- The Saint Vrain River from Hygiene to its confluence with the South Platte River, 35 km (22 mi);
- Boulder Creek from Boulder east to its confluence with the Saint Vrain River, approximately 35 km (22 mi);
- Walnut, Woman, and Dry Creeks downstream from Rocky Flats National Wildlife Refuge (NWR) to the confluence of Dry Creek and beyond to the South Platte River, 40 km (25 mi);
- Ralston Creek and Clear Creek through the urban corridor to the South Platte River, approximately 40 km (25 mi);
- The South Platte River downstream of Chatfield Reservoir through Denver to Brighton, 60 km (38 mi);
- The South Platte River downstream from Brighton to Greeley, approximately 55 km (34 mi) (one recent Preble's capture);
- Cherry Creek from the Arapahoe County-Douglas County line downstream through Denver to the South Platte River, 30 km (19 mi);
- Monument Creek downstream from its confluence with Cottonwood Creek through Colorado Springs, approximately 15 km (9 mi).

In total, Preble's meadow jumping mouse populations appear to have little likelihood of occurrence along 420 km (260 mi) in and downstream of areas with concentrated human development. However, despite apparent local extirpations, many of these streams continue to support Preble's meadow jumping mouse populations in their upstream reaches or tributaries.

Historical losses relative to ongoing threats are relevant in predicting whether the subspecies is likely to become endangered in all or a significant portion of its current range within the foreseeable future. It appears unlikely that the Preble's meadow jumping mouse can be returned to the historical localities within the Front Range urban corridor; however, we find that the subspecies' apparent local extirpation from areas of human development provides useful perspective about the potential impacts of future development within the remaining range of the Preble's meadow jumping mouse. If the protections of the Act are removed, we expect these threat factors, discussed in more detail below, would continue to affect the subspecies in large portions of its current range into the foreseeable future.

For the purposes of this revised proposed rule, we reviewed and considered the best available information regarding threats within the range of the Preble's meadow jumping mouse, including Ryon (1996), Shenk (1998), Bakeman (1997), Pague and Granau (2000), Clippinger (2002), and Service (2003b). We summarize these accounts below.

Following listing, The Nature Conservancy, under a contract with the Colorado Division of Natural Resources, formed a Preble's Meadow Jumping Mouse Science Team (Pague 1998). With guidance from the Science Team and following numerous meetings with scientists and stakeholders, Pague and Grunau (2000) developed a conservation planning handbook that addressed each of seven Colorado counties containing Preble's meadow jumping mouse populations. The document provided ''issues and stresses'' for all presumed threat factors operating in known or suspected Preble's meadow jumping mouse habitat, and assigned a qualitative risk assessment level to each of the identified issues. The work of Pague and Granau (2000) continues to provide important, science-based insight into threats to, and potential conservation strategies for, the Preble's meadow jumping mouse in Colorado on a county-by-county basis. Habitat-related ''issues'' identified as high or very high priority in one or more counties included habitat conversion through housing, commercial, and industrial construction; travel corridor (i.e., roadway) construction; travel corridor maintenance; fragmentation of habitat and corridors; hydrological flow impairment; habitat conversion to a reservoir; bank stabilization; high impact livestock management; rock and sand extraction; invasive weeds; and catastrophic fire (Pague and Granau 2000, pp. 1–15, 2–12, 3–13, 4–14, 5–14, 6–15, 7–14). Pague (2007) provided observations updating the 2000 report. No comparable document exists for the

four Wyoming counties where the subspecies occurs.

Colorado's Comprehensive Wildlife Conservation Strategy lists the meadow jumping mouse (including both the Preble's meadow jumping mouse and *Zapus hudsonius luteus* which occurs in extreme south-central Colorado) as a ''Species of Greatest Conservation Need,'' citing threats to habitat and range including habitat conversion (due to housing, urban, and exurban development) and habitat degradation (due to altered native vegetation and altered hydrological regime) (CDOW 2006, p. 102).

The Wyoming Comprehensive Wildlife Plan (WCWP) also lists meadow jumping mouse (including both the Preble's meadow jumping mouse and *Zapus hudsonius campestris* which occurs in northeastern Wyoming) as a ''Species of Greatest Conservation Need.'' This plan identifies ecoregions in the State and provides a summary of ''mean habitat quality'' scores for each ecological system (or habitat) within the ecoregion (WGFD 2005, pp. 19–25). Within the three Wyoming ecoregions that include Preble's meadow jumping mouse range (Central Shortgrass Prairie, Northern Great Plains Steppe, and Southern Rocky Mountains), the two ecological systems most likely to support the Preble's meadow jumping mouse (Rocky Mountain Lower Montane Foothill Riparian and Shrubland, Western Great Plains Riparian/Western Great Plains Floodplain) ranked in the lowest 20 percent in mean habitat quality relative to the State's other ecosystems (WGFD 2005, pp. 19–25). Among threats to habitat in these ecoregions are invasive plants, residential development radiating from the Cheyenne area, and recreation in the Southern Rocky Mountain region (WGFD 2005, pp. 53, 55, 56).

The direct impacts of development on the Preble's meadow jumping mouse and its habitat have likely slowed since our 1998 listing because of protection afforded to the Preble's meadow jumping mouse and its critical habitat rangewide under the Act. One indication of continuing impacts to the Preble's meadow jumping mouse and its habitat is the number of formal consultations performed to date under section 7 of the Act and the number of section 10 permits issued to date in conjunction with approved Habitat Conservation Plans (HCPs). Section 7 of the Act requires Federal agencies to consult with the Service to ensure that their actions do not jeopardize the continued existence of the subspecies or cause destruction or an adverse modification of critical habitat. Thus far, the section 7 process has been successful in avoiding adverse effects, from Federal actions, that would be likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of critical habitat.

Section 10(a)(1)(B) of the Act authorizes the Service to issue permits for non-Federal actions that result in the incidental taking of listed wildlife. Incidental take permit applications must be supported by an HCP that identifies conservation measures that the permittee agrees to implement for the species to avoid, minimize, and mitigate the impacts of the requested incidental take.

As of August 2007, we have conducted 124 formal section 7 consultations (109 in Colorado, 15 in Wyoming) and issued 19 HCP related incidental take permits (all in Colorado) for projects affecting the Preble's meadow jumping mouse. We have authorized take for actions that did not result in jeopardy but nevertheless resulted in permanent impacts to over 320 hectares (ha) (800 acres (ac)) of Preble's meadow jumping mouse habitat, and temporary impacts to more than twice that amount of land. These projects have incorporated conservation measures or mitigation to avoid or minimize adverse impacts to the Preble's meadow jumping mouse.

However, even with the protections afforded to the species under section 7, habitat overall has continued to decline in quality and quantity, especially in Colorado. In the absence of listing, projects in Preble's meadow jumping mouse habitat would otherwise go forward with little Federal oversight. Other Federal, as well as State and local regulatory mechanisms, that may provide protection for the Preble's meadow jumping mouse and its habitat are evaluated under Factor D below.

Residential and Commercial Development. Clippinger (2002) assessed the impacts of residential development on the Preble's meadow jumping mouse. He analyzed Colorado land-cover data compared to positive and negative trapping results for the Preble's meadow jumping mouse in a geographic information system analysis and concluded that the likelihood of successful trapping of Preble's meadow jumping mice was reduced by either low-or high-density residential developments when the developments were within 210 m (690 ft) of the trapping sites (Clippinger 2002, pp. iv, 94). Clippinger (2002, p. iv) noted that the Preble's meadow jumping mouse can be a useful indicator of environmental integrity in riparian areas and associated upland areas in the Colorado Piedmont. These data demonstrate that nearby development increases the risk of extirpation of Preble's meadow jumping mice from occupied sites.

Theobold et al. (1997) emphasized both housing density and spatial patterns in evaluating effects of residential development on wildlife habitat. They concluded that while clustered development can decrease habitat disturbance (Theobold et al. 1997, p. 34), much of the Rocky Mountain West is experiencing what has been termed ''rural sprawl'' where rural areas are growing at a faster rate than urban areas (Theobold et al. 2001, p. 4). In Colorado, residential demand and State law encourage developers to design subdivisions with lots of at least 14 ha (35 ac) each with one house, to avoid detailed county subdivision regulations (Riebsame et al., p. 420). The Larimer County Master Plan (Larimer County Planning Division 1997) cites a trend toward residential properties with relatively large lots, which leads to scattered development and more agricultural land taken out of production. Where public and private lands are intermingled, private land ownership typically follows valley bottoms (Theobald et al. 2001, p. 5), thus rural development is likely to disproportionately affect valley-bottom riparian areas (Riebsame et al., p. 402), the favored habitat of the Preble's meadow jumping mouse. Beyond direct impact to habitat, when ranches are subdivided, subsequent residential construction and associated disturbance can result in the disruption of wildlife movement along stream corridors (Riebsame et al., p. 402). Rural development disproportionately occurs around edges of undisturbed public lands and affects the conservation value of the undisturbed public lands (Hansen et al. 2005, p. 1900).

Human development often causes subtle effects on riparian habitat as well. Indirect effects of human settlement have resulted in declines in native trees and shrubs, greater canopy closure, and a more open understory with reduced ground cover within riparian habitat (Miller et al. 2003, p. 1055). An open understory does not favor the Preble's meadow jumping mouse, which prefers dense ground cover of grasses and shrubs and is less likely to use open areas where predation risks are assumed to be higher (Trainor et al. 2007, pp. 472–476; Clippinger 2002, pp. 69, 72).

Fragmentation is another indirect impact of development in proximity to Preble's meadow jumping mouse

habitat. The Preble's meadow jumping mouse is closely associated with narrow riparian systems that represent a small percentage of the landscape within the subspecies' range. Fragmentation of these linear habitats limits the extent and size of Preble's meadow jumping mouse populations. As populations become fragmented and isolated, it becomes more difficult for them to persist (Caughley and Gunn 1996, pp. 165–189). Major risks associated with small populations include—demographic stochasticity (an increased risk of decline in small populations due to variability in population growth rates arising from random differences among individuals in survival and reproduction within a season); environmental stochasticity (an increased risk of decline in small populations due to variation in birth and death rates from one season to the next in response to weather, disease, competition, predation, or other factors external to the population); and loss of genetic variation (a reduction in the amount of diversity retained within populations and an increased chance that deleterious recessive alleles may be expressed; the loss of diversity can limit a population's ability to respond adaptively to future environmental changes) (Caughley and Gunn 1996, pp. 165–189). These issues are discussed in greater detail in Factor E below. The Recovery Team determined that small, fragmented units of habitat will not be as successful in supporting the Preble's meadow jumping mouse in the long term as larger areas of habitat (Service 2003b, p. 21). On a landscape scale, maintenance of dispersal corridors linking patches of Preble's meadow jumping mouse habitat may be critical to the subspecies' conservation (Shenk 1998, p. 21).

One indicator of the level of development pressure since listing is the number of development-related section 7 consultations and HCPs completed by the Service. Of the 109 formal consultations and 19 HCPs completed in Colorado, 17 section 7 consultations and 10 HCPs were specifically for residential and commercial developments with direct adverse effects to the Preble's meadow jumping mouse or its habitat. Approved projects allowed for adverse impacts (permanent or temporary) in excess of 180 ha (450 ac) of Preble's habitat. While conservation measures or mitigation in various forms have been incorporated into all permitted projects, implementation of these habitat restoration and enhancement measures has been limited by factors such as droughts or floods. Recent development pressure has been most concentrated south of Denver, Colorado, in Douglas and El Paso Counties; eight section 7 consultations and three HCPs have occurred in the Middle South Platte-Cherry Creek drainage, all south of Denver, and six section 7 consultations and four HCPs have occurred in the Fountain Creek drainage. We have also worked with other Federal agencies and a substantial number of landowners and developers to avoid adverse impacts to Preble's meadow jumping mouse habitat, thus avoiding formal consultation. Additional planned residential and commercial development projects that would adversely affect Preble's meadow jumping mouse habitat in Colorado are continually being reviewed by the Service. Since listing, protections afforded under the Act have slowed, but not eliminated, the loss of Preble's meadow jumping mouse habitat due to residential and commercial development in Colorado. We believe that in the absence of the protections under the Act, Preble's meadow jumping mouse habitat in Colorado and the populations it supports would be lost at a greatly increased rate.

Continued rapid development is expected along Colorado's Front Range as the human population continues to grow. The State of Colorado expects the population of counties supporting the Preble's meadow jumping mouse to increase by an additional 1.5 million people by 2035, including: 99,000 in Boulder County; 272,000 in Douglas County; 42,000 in Elbert County; 369,000 in El Paso County; 143,000 in Jefferson County; 201,000 in Larimer County; and 323,000 in Weld County (Colorado Demography Office 2007). These expected increases support Pague and Grunau's (2000) conclusion that habitat conversion is a very high priority issue to the Preble's meadow jumping mouse in Larimer, Weld, and El Paso Counties, and a high priority issue for the remaining counties supporting the Preble's meadow jumping mouse in Colorado.

In contrast to the situation in Colorado, no formal section 7 consultations or HCPs have been sought for residential or commercial development in Wyoming. This reduced level of consultations reflects the general lack of development pressure within Preble's meadow jumping mouse habitat. This lack of development pressure is predicted to continue into the foreseeable future as described below.

Wyoming estimates that the population of the counties supporting the Preble's meadow jumping mouse will increase by about 11,000 people from 2005 to 2020, including: an increase of 800 in Albany County; an increase of 1,500 in Converse County; an increase of 9,100 in Laramie County; and a decrease of 400 in Platte County (Wyoming Department of Administration and Information 2007). Commercially available estimates suggest counties supporting the Preble's meadow jumping mouse will increase by about 18,400 people from 2006 through 2036, including: a decline of 3,700 in Albany County; an increase of 3,500 in Converse County; an increase of 18,300 in Laramie County; and an increase of 300 in Platte County (Economy.com 2007 as provided by Lui 2007).

While population growth rates provide valuable insight into development pressures, they may not provide a complete picture. For example, human population increases in Cheyenne, Fort Collins, Greeley, Longmont, the immediate Denver metropolitan area, and much of Colorado Springs are likely to have little direct impact on the Preble's meadow jumping mouse because the subspecies appears to have little likelihood of occurrence within and downstream from these cities. Conversely, substantial human population increases in the Laramie Foothills of Larimer County, Colorado, or southern portions of Douglas County, Colorado, are likely to have a high impact to the Preble's meadow jumping mouse. In Wyoming, given the small projected increases in the human population, we expect rural development will continue to have only small, localized impacts.

Modeling exercises can also provide some insights into future land-use development patterns. While these models have weaknesses, such as an inability to accurately predict economic upturns or downturns, uncertainty regarding investments in infrastructure that might drive development (such as roads, airports, or water projects), and an inability to predict open-space acquisitions, we nevertheless believe such models are useful in adding to our understanding of likely patterns. For example in 2005, Center for the West produced a series of maps predicting growth through 2040 for the west including the Colorado Front Range and Wyoming (Travis et al. 2005, pp. 2–7). The projections for the Colorado Front Range (available at: *http://www.centerwest.org/futures/frtrng/2040.html*) illustrate significant increases in urban/suburban, low-density suburban, and exurban land uses across virtually all private lands

within the Colorado portion of the Preble's meadow jumping mouse range. Only small isolated patches of Preble's meadow jumping mouse habitat in public ownership, including headwater areas in Federal ownership, would avoid the direct impacts of residential and associated commercial development. Although similar maps for Wyoming are less refined (available at: *http://www.centerwest.org/futures/west/2040.html*), they suggest only limited increases in development, primarily around Cheyenne.

Based upon known impacts to the Preble's meadow jumping mouse associated with development and best available projections for future development (as described above and in Factor D below), we conclude that residential and commercial development constitutes a substantial threat to the Preble's meadow jumping mouse in Colorado, now and into the foreseeable future. In Wyoming, residential and commercial development is likely to be limited with only small, localized impacts to the Preble's meadow jumping mouse expected. While some development is projected in the vicinity of Cheyenne, trapping efforts to date have not confirmed presence of Preble's meadow jumping mice in this area.

Transportation, Recreation, and Other Rights of Way Through Habitat. At the time of listing, the Service concluded that roads, trails, or other linear development through the Preble's meadow jumping mouse's riparian habitat could act as partial or complete barriers to dispersal (63 FR 26517, May 13, 1998). These forms of development have continued to affect and fragment Preble's meadow jumping mouse habitat. Since listing, the Service has conducted 38 formal consultations under section 7 of the Act for road or bridge projects (32 in Colorado and 6 in Wyoming) resulting in permitted impacts to approximately 50 ha (125 ac) of Preble's meadow jumping mouse habitat. In addition, a formal 2005 programmatic section 7 consultation with the Federal Highway Administration for the Wyoming Statewide Transportation Improvement Program could result in 19 future highway projects with impacts to 42 ha (104 ac) of Preble's meadow jumping mouse habitat (Service 2005). Under the Douglas County (Colorado) Regional HCP for the Preble's meadow jumping mouse, completed in May 2006, 67 approved road and bridge construction projects by Douglas County, and the cities of Parker and Castle Rock, may affect up to 122 ha (302 ac) of Preble's meadow jumping mouse habitat over a 10-year period (Service 2006).

One of the largest road projects is a proposed improvement to I–25 in El Paso County, Colorado. The proposed construction would affect 10 of the 11 to 14 eastern tributaries of Monument Creek thought to support Preble's (Bakeman and Meaney 2001, p. 21). Impacts to Preble's would include habitat fragmentation and modification, change in population size, and behavioral impacts (Bakeman and Meaney 2001, pp. 18–20). While measures to avoid, minimize, and mitigate impacts were identified, the project would have significant cumulative effects on Preble's meadow jumping mice in the Monument Creek drainage, especially east of I–25 (Bakeman and Meaney 2001, pp. i, ii, 22–27).

With an increased human population, a high level of road construction and maintenance projects will occur; in the absence of the Act's protective measures, impacts to Preble's and its habitat would likely be substantial. While the Act rarely stops such projects, it does promote measures to avoid, minimize, or compensate for impacts and helps control the level of negative impacts to the Preble's meadow jumping mouse and its habitat. Pague and Grunau (2000) considered ''travel corridor construction'' to be a high priority issue to Preble's meadow jumping mouse populations in Weld, Douglas, Elbert, and El Paso Counties in Colorado.

Human-caused impacts associated with recreation include backcountry roads, trails, and campgrounds, which are often located along streams and near water (Wyoming Game and Fish Department 2005, p. 56). Recreational trail systems are frequently located within riparian corridors (Meaney et al. 2002, p. 116). The development of trail systems can affect the Preble's meadow jumping mouse by modifying its habitat, nesting sites, and food resources in both riparian and upland areas. Use of these trails by humans or pets can alter wildlife activity and feeding patterns (Theobold et al. 1997, p. 26). Meaney et al. (2002, pp. 131–132) suggest fewer Preble's meadow jumping mice were found on sites with trails than on sites without trails. While temporal and spatial variation in Preble's meadow jumping mouse numbers resulted in low precision of population estimates and weak statistical support for a negative trail effect, the authors considered the magnitude of the potential effect sufficient to encourage careful management and additional research (Meaney et al. 2002, pp. 115, 131–132). Since the listing of the Preble's meadow jumping mouse in 1998, a dozen recreational trail projects with proposed impacts to Preble's meadow jumping mouse habitat in Larimer, Boulder, Douglas, and El Paso Counties, Colorado, have been addressed through section 7 consultations or HCPs. An additional 24 trail projects have been permitted under the Douglas County Regional HCP. As human populations continue to increase (as discussed above), we anticipate increased demand for recreational development in public open space and on conservation properties. Without protections afforded by the Act, Preble's meadow jumping mouse populations on properties free from residential and commercial development threats will still be subject to widespread threats from future recreational development and increased human use.

Many utility lines (sewer, water, gas, communication, and electric lines, and municipal water ditches) cross Preble's meadow jumping mouse habitat. Current and future utility rights-of-way through these habitats will cause habitat destruction and fragmentation from periodic maintenance and new construction. Since the listing of the Preble's meadow jumping mouse, 18 utilities projects adversely affecting the Preble's meadow jumping mouse and its habitat have been evaluated through section 7 consultations (3 in Wyoming, 15 in Colorado). In addition, an approved HCP with Denver Water permits impacts to 34 ha (84 ac) of Preble's meadow jumping mouse habitat at multiple sites in Colorado. While often more costly than trenching, avoidance measures such as directional drilling under riparian crossings can reduce or avoid impacts to the Preble's meadow jumping mouse. If the Preble's meadow jumping mouse were to be delisted, we do not anticipate that project operators would voluntarily directionally drill to avoid Preble's meadow jumping mouse habitat.

Overall, we believe threats related to transportation, recreation, and other rights of way through habitat are directly related to human population pressures. Thus, we expect these issues will have substantial impacts to Preble's meadow jumping mouse populations in Colorado, but only minimal impacts to Preble's meadow jumping mouse populations in Wyoming.

Hydrologic Changes. Establishment and maintenance of riparian plant communities are dependent on the interactions between surface-water dynamics, groundwater, and river-channel processes (Gregory et al. 1991, pp. 542–545). Changes in hydrology can

alter the channel structure, riparian vegetation, and valley-floor landforms (Gregory et al. 1991, pp. 541–542; Busch and Scott 1995, p. 287). Thus, changes in the timing and abundance of water can be detrimental to the persistence of the Preble's meadow jumping mouse in these riparian habitats due to resultant changes in vegetation (Bakeman 1997, p. 79). Changes in hydrology may occur in many ways, but two of the more prevalent are the excessively high and excessively low runoff cycles in watersheds with increased areas of paved or hardened surfaces, and disruption of natural flow regimes downstream of dams, diversions, and alluvial wells (Booth and Jackson 1997, pp. 3–5; Katz et al. 2005, pp. 1019–1020).

Urbanization can dramatically increase frequency and magnitude of flooding while decreasing base flows (the portion of stream flow that is not surface runoff and results from seepage of water from the ground into a channel slowly over time; base flow is the primary source of running water in a stream during dry weather) (Booth and Jackson 1997; pp. 8–10; National Research Council 2002, pp. 182–186). Infiltration of precipitation is greatly reduced by increases in impervious surfaces. The magnitude of peak flows increases in urban areas as water runs off as direct overland flow. Increased peak flows can exceed the capacity of natural channels to transport flows, trigger increased erosion, and degrade habitat (Booth and Jackson 1997, pp. 3–5). Changes in hydrology associated with urbanization can result in channel downcutting, lowering of the water table in the riparian zone, and creation of a ''hydrologic drought,'' which in turn alters vegetation, soil, and microbial processes (Groffman et al. 2003, p. 317). Meanwhile, reduced infiltration results in reduced groundwater recharge, reduced groundwater contributions to stream flow, and, ultimately, reduced base flows during dry seasons (National Research Council 2002, p. 182; Groffman et al. 2003, p. 317). Established methods of mitigating downstream impacts of urban development, such as detention basins, have only limited effectiveness; downstream impacts are probably inevitable without limiting the extent of watershed development (Booth and Jackson 1997, p. 17).

In response to altered hydrology, stormwater-management, flood-control, and erosion-control efforts occur along many streams within the former and current range of the Preble's meadow jumping mouse. The methods used include channelization; construction of detention basins, outfall structures, drop structures, riprap banks, impervious cement channels; and other structural stabilization. Structural stabilization methods designed to manage runoff and control erosion can increase the rate of stream flow, shorten channel length, narrow riparian areas, destroy riparian vegetation, and prevent or prolong the time required for vegetation reestablishment (Booth and Jackson 1997, p. 4). These impacts may affect plant composition, soil structure, and physiography of riparian systems to the point where habitat supporting the Preble's meadow jumping mouse is so altered that populations can no longer persist. Pague and Grunau (2000) considered ''bank stabilization'' to be a high-priority issue for the Preble's meadow jumping mouse in Weld and El Paso Counties. Since the listing of the Preble's meadow jumping mouse, 22 stormwater management, stream stabilization, or outfall structure projects with impact to Preble's meadow jumping mouse habitat have been addressed through formal section 7 consultations in Colorado; none have occurred in Wyoming.

The Preble's meadow jumping mouse's apparent absence downstream from most areas of extensive urbanization (including Cheyenne, Wyoming, and Fort Collins, Longmont, Boulder, Golden, Denver, Parker, and Colorado Springs, Colorado) may be attributable to such changes in hydrology. Corn et al. (1995, p. 14) and Schorr (2001, p. 30) expressed concern over the integrity of protected riparian habitats on Monument Creek and its tributaries through the U.S. Air Force Academy (Academy) because of development activities upstream. In 2007, all eastern tributaries of Monument Creek on the Academy experienced adverse impacts to occupied Preble's meadow jumping mouse habitat due to erosive head cutting, channel degradation, and impacts to vegetation that were attributable to regional stormwater management, and commercial and residential development (Mihlbachler 2007).

Efforts to restore degraded riparian habitats have occurred in Colorado, in part to benefit the Preble's meadow jumping mouse. Efforts to restore Preble's meadow jumping mouse habitat through a 0.86 km (0.54 mi) urban stream reach of East Plum Creek, Douglas County appear to have increased vegetation cover and Preble's meadow jumping mouse numbers (Bakeman 2006, pp. 4, 8). Similarly, recent projects on Cherry Creek, Douglas County, have attempted to restore groundwater levels and downcut channels in or near Preble's meadow jumping mouse habitat by employing rock or sheet pile drop structures.

If we were to delist the Preble's meadow jumping mouse, we believe that runoff-related impacts to riparian habitats within and downstream of development may increase in areas of high development, such as along Colorado's Front Range urban corridor, and that restoration of impacted riparian systems would be less likely to occur.

At the time of listing, we stated that the Preble's meadow jumping mouse depended on vegetative habitat that was in turn dependent on physical factors including surface flows and groundwater. Water development and management in its various forms alters vegetation composition and structure, riparian hydrology, and flood-plain geomorphology directly, as well as through alterations to habitat located downstream; these alterations often, but not always, have adverse impacts to the Preble's meadow jumping mouse (63 FR 26517 May 13, 1998). The creation of irrigation reservoirs at the expense of native wetlands is a factor that negatively affected Preble's meadow jumping mouse populations over the previous century (Fitzgerald et al. 1994, p. 293). Reservoirs with barren shorelines can create barriers to Preble's meadow jumping mouse movement and fragment populations along stream corridors. Current and future reservoir construction is necessary to respond to municipal water needs. By 2030, municipal and industrial demand for water in Colorado will increase 60 percent, by 578 million cubic meters (m^3) (469,000 acre-feet (af)) yearly in the South Platte River drainage and by 41 percent, 133 million m^3 (108,000 af) yearly in the Arkansas River drainage (Colorado Water Conservation Board 2004). Even under the most optimistic scenarios, the Colorado Water Conservation Board (2004, p. 13–17) estimated a shortfall relative to municipal and industrial demands of 111 million m^3 (90,000 af) of water in the South Platte drainage and 22 million (m^3) (18,000 af) in the Arkansas drainage by 2030. Pague and Grunau (2000) considered hydrological impacts (water quality, flow regime, and groundwater) to be a high-priority issue to the Preble's meadow jumping mouse in all Colorado counties supporting populations.

Three water projects currently being considered may significantly affect Preble's meadow jumping mouse habitat including: The proposed expansions of existing Halligan and Seaman reservoirs in the Cache La Poudre drainage,

Larimer County, Colorado, and storage reallocation at Chatfield Reservoir, in the Upper South Platte drainage, Jefferson and Douglas Counties, Colorado. Options being considered at Halligan Reservoir could inundate up to 4.0 km (2.5 mi) of Preble's meadow jumping mouse habitat and affect Preble's critical habitat at the site of the proposed dam. At Seaman Reservoir, the currently favored option would inundate about 4.0 km (2.5 mi) of Preble's meadow jumping mouse critical habitat, while another option being considered would inundate about 11 km (7 mi). Options being investigated at Chatfield Reservoir have generated a preliminary estimate that up to 130 ha (330 ac) of existing Preble's meadow jumping mouse habitat, including almost 28 ha (70 ac) of critical habitat, would be inundated.

In Wyoming, estimates of projected water use in the Platte River Basin through 2035, range from a 38 million m^3 (31,000 af) decrease (2 percent) to a 90 million m^3 (73,000 af) increase (6 percent) (Wyoming Water Development Commission 2006, p. 10). No significant reservoir projects are currently planned within Preble's habitat in Wyoming. While the Platte River Plan identifies ''upper Laramie River storage'' as a future storage opportunity (Wyoming Water Development Commission 2006, p. 31), potential impacts to Preble's meadow jumping mouse are uncertain based on limited knowledge of the subspecies' occurrence in the drainage and uncertainty regarding the location of any future water projects.

Beyond direct effects to the Preble's meadow jumping mouse and its habitat through construction or inundation, changes in flows related to water diversion, storage, and use also affect riparian habitats downstream in a variety of ways. As flows are captured or diverted, or as groundwater supplies are depleted through wells, natural flow patterns are changed, and more xeric plant communities replace the riparian vegetation. Sediment transport is disrupted by on-stream reservoirs. Loss of sediment encourages channel downcutting, which in turn affect groundwater levels (Katz et al. 2005, p. 1020). The resulting conversion of habitats from moist or mesic, shrub-dominated systems to drier grass-or forb-dominated systems make the area less suitable for the Preble's meadow jumping mouse.

Given the projected future demands for water, we believe that major water development projects affecting the Preble's meadow jumping mouse in Colorado would likely occur regardless of whether the subspecies remains listed. Measures to minimize and compensate for impacts specific to the Preble's meadow jumping mouse and its habitat are less likely to be incorporated into project plans if the subspecies were to be delisted. Fewer and smaller projects are likely to occur in Wyoming.

Aggregate Mining. At the time of listing, we cited alluvial aggregate mining as a threat to the Preble's meadow jumping mouse. Aggregate mining is focused on floodplains, where these mineral resources most commonly occur, and specifically on the same gravel deposits that may provide important hibernation sites (63 FR 26517, May 13, 1998). Alluvial aggregate mining continues to be a threat to the Preble's meadow jumping mouse in Colorado. Alluvial aggregate extraction may produce long-term changes to Preble's meadow jumping mouse habitat by removing (often permanently) shrub and herbaceous vegetation, and by altering hydrology. Often, mined pits are constructed with impervious liners and converted to water reservoirs after aggregate is removed. This conversion precludes restoration of riparian shoreline vegetation and alters adjacent groundwater flow.

Since listing, we have conducted formal consultation under section 7 of the Act regarding impacts to the Preble's meadow jumping mouse at two aggregate mines in Colorado and we have worked to avoid impacts at others. At Rocky Flats National Wildlife Refuge (NWR), private aggregate mining activities could affect Preble's meadow jumping mouse habitat directly or through alteration of hydrology along Rock Creek. While aggregate mining continues to affect floodplains in the Colorado Front Range, many project sites are along downstream reaches of larger streams and rivers where Preble's meadow jumping mouse populations appear absent. Pague and Grunau (2000) considered ''rock and sand extraction'' to be a high-priority issue in Weld, Jefferson, and Douglas Counties. In Wyoming, aggregate mining has not been an issue in Preble's meadow jumping mouse habitat and we have no information on any proposed mines in this portion of its range.

Overall, we believe threats related to aggregate mining are likely to be more intense in areas in close proximity to residential and commercial development. Thus, we expect this issue will have an impact on Preble's meadow jumping mouse populations in Colorado. In Wyoming, we expect aggregate mining will have little, if any, effect on Preble's meadow jumping mouse populations as future development is projected to be far less.

Agriculture. At the time of listing we cited conclusions by Compton and Hugie (1993a; 1993b) that human activities, including conversion of grasslands to farms and livestock grazing, had adversely impacted Preble's meadow jumping mouse. They concluded that development of irrigated farmland had a negative impact on Preble's meadow jumping mouse habitat, and that any habitat creation it produced was minimal (Compton and Hugie 1993a; Compton and Hugie 1993b). In general, negative trapping results suggest that the Preble's meadow jumping mouse does not occur in areas cultivated for row crops. Historically, the rapid rate of native habitat conversion to row crops likely had a significant adverse impact on the Preble's meadow jumping mouse. Because conversion of native habitat to row crops has become increasingly rare in both Colorado and Wyoming (U.S. Department of Agriculture 2000, Tables 2, 3, & 9), such conversions are unlikely to present a similar threat in the future in any portion of the subspecies range.

The Preble's meadow jumping mouse uses native grass and alfalfa hayfields when they are in or adjacent to suitable riparian habitat. This juxtaposition is often the case, since hay production requires large amounts of water. Mowing of hay may directly kill or injure Preble's meadow jumping mice, reduce food supply (since many plants will not mature to produce seed), and remove cover. Late season mowing may be especially problematic, because Preble's meadow jumping mice are approaching hibernation and their nutritional needs are high (Clippinger 2002, p. 72). Additionally, hay production may preclude growth of willows and other shrubs that are important as hibernation habitat for the Preble's meadow jumping mouse. Hayfields often are irrigated through ditch systems. The Preble's meadow jumping mouse uses overgrown water conveyance ditches and pond edges, and may use agricultural ditches as dispersal routes (Meaney et al. 2003, pp. 612–613). Ditch maintenance activities may kill individual Preble's meadow jumping mice and periodically alter their habitat. Existing special regulations at 50 CFR 17.40(l) exempt certain ditch maintenance operations from take prohibitions of the Act in recognition that habitat the ditches provide is dependent on the ditches retaining their function. Preble's meadow jumping mouse populations have persisted in areas hayed for many years (Taylor 1999). Haying operations that allow dense riparian vegetation to

remain in place are likely compatible with persistence of Preble's meadow jumping mouse populations.

Impacts to riparian habitat from livestock are well documented in the scientific literature (Kauffman and Krueger 1984, pp. 431–435; Armour et al. 1991, pp. 7–11; Fleischner 1994, pp. 629–638; Belsky et al. 1999, pp. 419–431; Freilich et al. 2003, pp. 759–765). Livestock have damaged 80 percent of stream and riparian ecosystems in the western United States (Belsky et al. 1999, p 419.). Adverse impacts of grazing include changes to stream channels (downcutting, trampling of banks, increased erosion), to flows (increased flow and velocity, decreased late-season flow), to the water table (lowering of the water table), and to vegetation (loss to grazing, trampling, and through altered hydrology) (Kauffman and Krueger 1984, pp. 432–435).

Impacts from cattle grazing to other jumping mice subspecies have been documented by Frey (2005), Giuliano and Homyack (2004), and Medin and Clary (1989). Ryon (1996, p. 3) cited livestock grazing as a contributor to the lack of structural habitat diversity he observed on historical Preble's meadow jumping mouse sites in Colorado. On a working ranch in Douglas County, Colorado, Preble's meadow jumping mice were detected within cattle exclosures, but not on grazed areas. Previous trapping had documented Preble's meadow jumping mice upstream and downstream, but not on the ranch (Ensight Technical Services 2004, p. 9). On private lands in Douglas County, Colorado, Pague and Schuerman (1998, pp. 4–5) observed a swift rate of residential land development and significant fragmentation of habitat, but noted that in some cases accompanying secession of grazing had allowed recovery of degraded riparian habitats.

In Colorado, City of Boulder lands endured intensive grazing, farming, or haying regimes until they became part of the Boulder Open Space system. Grazing and haying, used as land management tools, continue on Boulder Open Space sites currently supporting the Preble's meadow jumping mouse. In their study of small mammals on Boulder Open Space, Meaney et al. (2002, p. 133) found no adverse effects of managed grazing on abundance of individual small mammal species or on species diversity.

Cattle can undoubtedly greatly affect herbaceous vegetation, especially in times of drought; grazing practices that assure maintenance of riparian shrub cover may be a key consideration in maintaining Preble's meadow jumping mouse populations (Ensight Technical Services 2004, p. 9). The recent drought, in combination with grazing, may have had an increased effect on Preble's meadow jumping mouse habitat.

Overgrazing threats are not limited to large livestock producing operations. On subdivided ranch properties, often termed ''ranchettes,'' horses and other livestock can heavily affect the small tracts within which they are fenced (Pague and Grunau 2000, pp. 1–14). Pague and Grunau (2000) considered ''high impact livestock grazing'' to be a high-priority issue for the Preble's meadow jumping mouse in Larimer, Weld, Elbert, and El Paso Counties in Colorado, largely due to the projected increase in such ranchettes.

In Wyoming, where large-scale commercial ranching is more prevalent in the Preble's meadow jumping mouse's range than in Colorado, overgrazing is thought to occur sporadically across the landscape, most obviously where cattle congregate in riparian areas in winter and spring. Grazing has occurred within Preble's meadow jumping mouse habitat for many decades, and populations of Preble's meadow jumping mice have been documented on sites with a long history of grazing. For example, jumping mice were trapped at 18 of 21 sites on True Ranches properties (mice from 14 of these sites have since been confirmed as Preble's meadow jumping mice (King et al. 2006b, p. 4351)), primarily within sub-irrigated hay meadows that have been subjected to livestock grazing and hay production for approximately 100 years (Taylor 1999, p. 5).

At the time of listing, we addressed overgrazing by livestock, stating that it may have caused significant impacts to Preble's meadow jumping mouse habitat, but that timing and intensity of grazing were probably important to some degree in maintaining habitat and that maintenance of woody vegetative cover could be key (63 FR 26517, May 13, 1998). Overgrazing was thought to have eliminated the Preble's meadow jumping mouse from much of its former Wyoming range (Clark and Stromberg 1987, p. 185; Compton and Hugie 1993b, p. 4). Trapping efforts since listing have greatly expanded our understanding of the subspecies' range in Wyoming, suggesting that our assertions that grazing eliminated Preble's from these areas were incorrect.

As suggested by Bakeman (1997, p. 79) and Pague and Grunau (2000, p. 1–17), and as supported by the examples above, grazing is compatible with Preble's meadow jumping mouse when timing and intensity are appropriately managed. We now believe that agricultural operations that have maintained habitat supportive of Preble's meadow jumping mouse populations are consistent with conservation and recovery of the subspecies. In recognition of this, we adopted in 2001 special regulations at 50 CFR 17.40(1) which exempted existing agricultural activities, including grazing, plowing, seeding, cultivating, minor drainage, burning, mowing, and harvesting, from the prohibitions of the Act. The exemption does not apply to new agricultural activities or to those that expand the footprint or intensity of the activity. We established the exemption to provide a positive incentive for agricultural interests to participate in voluntary conservation activities and to support surveys and studies designed to determine status, distribution, and ecology of Preble's meadow jumping mouse, which in turn could lead to more effective recovery efforts.

The number of cattle in counties currently known to support the Preble's meadow jumping mouse in Wyoming totaled 270,000 head in 2006 (National Agriculture Statistics Service 2007). Cattle numbers appear stable in Albany, Converse, and Laramie Counties, but higher than the average for the last 20 years in Platte County. Cattle numbers in Colorado counties supporting the Preble's meadow jumping mouse totaled 666,000 head in 2006, but they total only 116,000 head if Weld County, where few Preble's meadow jumping mice are thought to persist, is excluded (National Agriculture Statistics Service 2007). Excluding Weld, all of these Colorado counties have shown a marked downward trend in cattle numbers over the past 20 years, reflecting human development on former agricultural lands (National Agriculture Statistics Service 2007).

Overall, we expect traditional grazing operations to continue in Wyoming. Such operations have generally proven compatible with Preble's meadow jumping mice as timing and intensity have been managed appropriately. This management has taken place without ESA oversight as allowed in the special regulations at 50 CFR 17.40(1). We have no reason to believe the management of these facilities will change significantly in the future.

In Colorado, many large ranch properties are being subdivided into ''ranchettes.'' These small tracts can be heavily affected by concentrated grazing pressures. We believe that this represents a widespread threat to significant areas of Colorado, where an increase in rural development is forecast

in the foreseeable future. Based on growth projections, subdivision of ranches is expected to be minimal in portions of Wyoming where the Preble's meadow jumping mouse exists.

Summary. Within Colorado, human land uses within the Preble's meadow jumping mouse's range have destroyed, degraded, and fragmented habitat and continue to do so. While protections of the Act have avoided, minimized, and helped to compensate for direct human land-use impacts to occupied Preble's meadow jumping mouse habitat, secondary impacts to riparian habitats have likely diminished the areas that are capable of sustaining Preble's populations. Given the projected future growth rates in Colorado, and absent protections associated with Federal activities and listing under the Act, we believe that threats posed by human development activities discussed above would rise dramatically following delisting. Most of the new Preble's meadow jumping mouse sites documented since listing in Colorado are subject to the same level of threats discussed above for the Colorado portion of the range in general and do not change our conclusion as to the current and future conservation status of the subspecies in this portion of its range. Regulatory mechanisms that could help reduce such negative impacts, while currently limited, are discussed under Factor D below.

In Wyoming, the Preble's meadow jumping mouse appears to be much more widely distributed than previously assumed, while current and future threats to habitat and range appear limited. Such impacts to the Wyoming portion of the subspecies' range are likely to be minor with only small and localized effects. Therefore, we believe that present or threatened destruction, modification, or curtailment of the Preble's meadow jumping mouse habitat and range in Wyoming do not suggest that this subspecies is likely to become endangered within the foreseeable future throughout all of its range.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

The Preble's meadow jumping mouse is not collected for commercial or recreational reasons. Some collection of specimens occurs for scientific and educational purposes, but currently only through permits issued by the Service, CDOW, or WGFD. Although unintentional mortalities have resulted from capture and handling of Preble's meadow jumping mice by permitted researchers, we believe that the level of take associated with this activity does not rise to the level that would affect populations of the subspecies, nor is it likely to do so if we remove the protections of the Act.

C. Disease or Predation

At the time of listing, we had no evidence of disease causing significant impacts to the Preble's meadow jumping mouse (63 FR 26517, May 13, 1998). No further evidence exists that any parasite or disease has caused a significant impact to populations. While plague relationships for most North American rodents are poorly understood, plague may interact synergistically with other natural and human-induced disturbances, increasing risk of local extirpation and rangewide extinction (Biggins and Kosoy 2001, p. 913). Plague has not been documented in the Preble's meadow jumping mouse. However, Pague and Grunau (2000, pp. 1–19) considered disease to be a potentially high-priority issue for the Preble's meadow jumping mouse. They cited unknown resistance of the Preble's meadow jumping mouse to plague and other diseases, and noted that small populations could be especially vulnerable to effects of an epizootic. Should disease materialize into a substantive issue, we believe populations in Colorado would be at higher risk because development pressures in this portion of the range are more likely to result in small, fragmented, and unsustainable populations.

At the time of listing, we addressed potential predators of the Preble's meadow jumping mouse whose densities could increase in the suburban or rural environment, including striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), and the domestic cat (*Felis catus*) (63 FR 26517, May 13, 1998). Increased impacts of native and exotic predators that accompany rural development can affect species viability (Hansen et al. 2005, p. 1899). We noted opinions that free-ranging domestic cats and feral cats locally presented a problem to Preble's meadow jumping mouse populations. Where predator populations are increased through human land uses, they may contribute to the loss or decrease of Preble's meadow jumping mouse. Generally, we have found proponents of new residential developments near Preble's meadow jumping mouse habitat to be receptive to prohibitions on free-ranging cats and dogs (*Canis domesticus*) when negotiating minimization measures through section 7 of the Act. However, enforcement is often through covenants administered by homeowners' associations with uncertain success. If the Preble's meadow jumping mouse were to be delisted and Federal protection under the Act discontinued, similar covenants on new development in and near Preble's meadow jumping mouse habitat would be less likely, and existing covenants may not be as strictly enforced. Beyond previously known or anticipated predators of jumping mice, introduction of non-native bullfrogs (*Rana catesbiana*) in Colorado has resulted in predation on Preble's meadow jumping mice (Trainor 2004, p. 58). However, we have no information to suggest that predation from bullfrogs has affected Preble's meadow jumping mouse populations.

While many uncertainties remain regarding disease and predation, we believe the best available scientific and commercial data suggest that disease is most likely to only be a factor in small and fragmented populations, and that increases in predation will likely only contribute to the reduction, fragmentation, and loss of Preble's meadow jumping mouse populations when such populations are exposed to increased human presence. As noted above, increased human presence is expected to be a significant issue in Colorado and of minimal concern in Wyoming. Thus, we expect these issues have the potential to meaningfully affect Preble's meadow jumping mouse populations in developing areas of Colorado, but comparable impacts in Wyoming are not expected.

D. The Inadequacy of Existing Regulatory Mechanisms

This factor considers the regulatory mechanisms that would remain in place in the absence of the Act's protective measures. Current and likely future protections are considered. If the protections of the Act are removed, the Service has no assurances previous conservation commitments made under sections 7 or 10 of the Act would remain in place.

At the time of listing, we cited the lack or ineffectiveness of laws and regulations protecting the Preble's meadow jumping mouse and its habitat (63 FR 26517, May 13, 1998). Protective measures discussed below include Federal, State, and local protections.

Federal Protections. Existing Federal laws, such as the Clean Water Act (33 U.S.C. 1251 et seq.), Federal Power Act (16 U.S.C. 791a et seq.), Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.), National Forest Management Act (16 U.S.C. 1600 et seq.), Federal Land Policy and Management Act (43 U.S.C. 1701 et seq.), Food Security Act (16 U.S.C. 3801 et seq.), and National Environmental

Policy Act (42 U.S.C. 4321 et seq.), provide limited protection for non-listed species.

Section 404 of the Clean Water Act generally requires avoidance, minimization (when practicable), and mitigation of adverse impacts to jurisdictional wetlands and waters of the United States associated with filling. Human impacts to jurisdictional wetlands may be permitted when alternatives that would avoid wetlands are found not to be practicable. Section 404 of the Clean Water Act does not apply to non-jurisdictional waters or wetlands that include some streams corridors known to support the Preble's meadow jumping mouse (most notably Running Creek and its tributaries in Elbert County, Colorado, but potentially on other streams with intermittent flows or where there is no regular connection to waters of the United States). In these cases, activities effecting these waters or wetlands would not require Federal permits under Section 404 of the Clean Water Act. In addition, Section 404 of the Clean Water Act provides no comparable safeguards for nearby uplands used by the Preble's meadow jumping mouse. Thus, the Clean Water Act provides only limited protection of habitats utilized by the Preble's meadow jumping mouse and is not capable of substantially reducing threats to individual Preble's populations or to the subspecies as a whole.

On lands administered by the U.S. Forest Service and U.S. Bureau of Land Management, the current status of the Preble's meadow jumping mouse as threatened invokes management priorities in accordance with the Act. If delisted, these protections would no longer apply. However, Federal land-management agencies, through their regulations, policies, and management plans, work to ensure long-term protection of all listed species. Of the three National Forests supporting Preble's meadow jumping mouse populations, the Medicine Bow—Routt National Forest has a forest management plan that includes standards and guidelines specific to conservation of the Preble's meadow jumping mouse. The Arapahoe-Roosevelt National Forest and the Pike-San Isabel National Forest have forest plans that predate the listing of the Preble's meadow jumping mouse (Warren 2007). If delisted, the Preble's meadow jumping mouse would likely be considered a subspecies warranting conservation concern by Federal land-holding agencies and, as such, retain some continued degree of conservation priority.

On military installations, the Sikes Act Improvement Act of 1997 (16 U.S.C. 670a et seq.) requires each facility that includes land and water suitable for the conservation and management of natural resources to complete an Integrated Natural Resources Management Plan (INRMP). This plan must integrate implementation of the military mission of the installation with stewardship of the natural resources found there. In both Colorado and Wyoming, this process has provided the opportunity to consider the potential impacts of military actions on the Preble's meadow jumping mouse.

Warren Air Force Base in Laramie County, Wyoming, has an INRMP and a conservation and management plan. However, the base may only support the western jumping mouse. The Air Force Academy in El Paso County, Colorado, has an INRMP in place, a conservation and management plan, and a programmatic consultation under section 7 of the Act, which provides guidance for Air Force management decisions for certain activities that may affect the subspecies. Research on the Preble's meadow jumping mouse is ongoing at the Academy; the conservation and management plan is designed to be updated as new information is collected. Both plans are designed to be in place for 5 years. The emphasis given to conservation of the Preble's meadow jumping mouse in these plans may decline in the future if the subspecies were to be delisted.

The presence of Preble's meadow jumping mouse has been documented at two of the Service's NWRs. We manage the Rocky Flats NWR, near Boulder, Colorado, in a manner consistent with conservation of the Preble's meadow jumping mouse. This management is unlikely to change if the Preble's meadow jumping mouse were to be delisted.

More recently, a single Preble's meadow jumping mouse as well as western jumping mice have been confirmed from Hutton Lake NWR near Laramie, Wyoming. Because this subspecies was only recently documented on Huttom Lake NWR, the subspecies needs are not explicitly addressed in management documents (Timberman 2007). While it is unknown if ongoing management (primarily waterfowl oriented) is consistent with the subspecies' needs, the refuge has expressed a willingness to provide for the needs of the subspecies in the future (Timberman 2007).

Service-approved HCPs and their incidental take permits contain management measures and protections for identified areas that protect, restore, and enhance the value of these lands as habitat for the Preble's meadow jumping mouse. These measures, which include explicit standards to avoid, minimize, and mitigate any impacts to the covered (sub)species and its habitat, are designed to ensure that the biological value of covered habitat for the Preble's meadow jumping mouse is maintained, expanded, or improved. Large regional HCPs expand upon the basic requirements set forth in section 10(a)(1)(B) of the Act and reflect a voluntary, cooperative approach to large-scale habitat and (sub)species conservation planning. The primary goal of such HCPs is to provide for the protection and management of habitat essential for the conservation of the (sub)species while directing development to other areas. In any HCP, permittees may terminate their participation in the agreement and abandon the take authorization set forth in the permit.

To date, we have approved 19 single species HCPs for the Preble's meadow jumping mouse, all in Colorado. Eighteen of the associated permits allow approximately 280 ha (700 ac) of permanent or temporary impact to Preble's meadow jumping mouse habitat, and preserve or enhance habitat to offset impacts. The largest of these, the approved HCP for Douglas County and the Towns of Castle Rock and Parker, allows impacts of up to 170 ha (430 ac), in exchange for the acquisition of 9 km (15 mi) of stream and 455 ha (1,132 ac) of habitat, was acquired and preserved for the long-term benefit of the Preble's meadow jumping mouse.

The remaining HCP, issued in January 2006, is the Livermore Area HCP in Larimer County. The planning area for this HCP includes a large portion of Larimer County, approximately 1,940 square km (750 square mi), including a Preble's meadow jumping mouse ''conservation zone'' estimated at approximately 324 km (201 mi) of stream and 8,570 ha (21,320 ac). The HCP cites protection of 114 km (71 mi) of stream, mostly on CDOW lands; however, it is not clear what proportion of these areas support Preble's. Local landowners and public agencies holding land within the boundaries of this HCP may opt for coverage under the HCP and receive take permits for activities consistent with the HCP. The Livermore Area HCP is designed to support current land uses, including ranching and farming. However, inclusion of landowners is optional, and they may choose to pursue land uses inconsistent with those specified in the HCP. Thus far, we have issued no individual permits under this HCP.

Of the two regional HCPs in the process of being developed, the El Paso

County effort is proceeding slowly and the Boulder County effort appears to be on hold. It is unlikely that these conservation plans will be completed or implemented if the Preble's meadow jumping mouse does not remain listed under the Act.

State Protections. Under the nongame provisions of the CDOW Regulations (Chapter 10, Article IV) the Preble's meadow jumping mouse currently may only be taken legally by permitted personnel for educational, scientific, or rehabilitation purposes. However, if delisted, Colorado could rescind its current State designation of threatened. In Wyoming, continued classification of the meadow jumping mouse as a ''nongame species'' under Section 11 of Chapter 52 (Nongame Wildlife) of the Wyoming Game and Fish Commission regulations would protect the Preble's meadow jumping mouse from takings and sales by allowing the issuance of permits only for the purpose of scientific collection. As mentioned previously in our discussion under Factor B, overutilization for commercial, recreational, scientific, or educational purposes is not now, nor is it likely to become a significant threat to the subspecies, even if the protections afforded the subspecies under Colorado and Wyoming laws are removed.

Numerous State lands (CDOW lands, State Park lands, State Land Board lands) and mitigation properties (such as those of the Colorado Department of Transportation) would continue to provide a measure of protection for the Preble's meadow jumping mouse should it be delisted. While some conservation properties may have management specifically designed to preserve and enhance Preble's meadow jumping mouse habitat, others concentrate more on open-space preservation and general wildlife-habitat conservation.

State programs have been available to help preserve the Preble's meadow jumping mouse through the acquisition, preservation, and management of its habitat. These include the Great Outdoors Colorado Trust Fund and the Species Conservation Trust Fund. In comments to the Service, then Colorado Department of Natural Resources Commissioner, Russell George, stated that State and local initiatives could provide for conservation of the Preble's meadow jumping mouse, independent of Federal oversight. He listed nearly 40 conservation projects in 5 Front Range Colorado counties where the Preble's meadow jumping mouse ''may be present'' (George 2004). The conservation value of many of these projects is uncertain since most were developed without specific regard to the Preble's meadow jumping mouse's distribution and its conservation.

Local Protections. At the time of listing, we pointed out that while a myriad of regional or local regulations, incentive programs, and open-space programs existed, especially in Colorado, few specifically protected the Preble's meadow jumping mouse or its habitat from inadvertent or intentional adverse impacts (63 FR 26517, May 13, 1998). Many local regulations create a process of site-plan review that ''considers'' or ''encourages'' conservation of wildlife, wetlands, and other natural habitats. Effectiveness of local regulations in maintaining naturally functioning riparian corridors varies greatly depending on how these apparently flexible regulations are implemented. Following listing under the Act, development and other projects in and near Preble's meadow jumping mouse habitat have received increased scrutiny from local jurisdictions, often in coordination with Service authorities. Open-space acquisitions and easements have also taken the presence of the Preble's meadow jumping mouse into account. It is not clear what level of interest in Preble's meadow jumping mouse conservation would continue following delisting. Local governments would likely relax review procedures for projects in known or suspected Preble's meadow jumping mouse habitat. Beyond the direct impact to Preble's meadow jumping mouse habitat, secondary impacts of development (including increased recreational use, altered flow regimes and groundwater levels, and increase in domestic predators) are unlikely to be adequately addressed. While certain local regulations are designed to conserve wetlands or floodplains on private lands, it is unlikely they would effectively control land uses (grazing, mowing, cutting, and burning) that may affect the hydrology, vegetation, and hibernacula sites on which Preble's depends. The adequacy of such protective measures is more important within Colorado than Wyoming given the intense development pressures in the Colorado counties where the Preble's meadow jumping mouse occurs.

Douglas County, Colorado, owns 14 properties that encompass 24 km (15 mi) of stream and associated riparian habitats potentially beneficial to the Preble's meadow jumping mouse (Matthews 2004). Of Douglas County streams on non-Federal property within the Riparian Conservation Zone, 105 km (65 mi), or 23 percent, are under some form of permanent protection (Matthews 2004). However, occurrence of the Preble's meadow jumping mouse on many of these properties has not been extensively documented. For example, while there are 23.4 km (14.5 mi) of mapped riparian corridors on the large Greenland Ranch conservation property, the presence of the Preble's meadow jumping mouse has been documented at only two sites. Future conservation efforts to augment protected areas and to link protection over large expanses of connected streams in Douglas County could contribute greatly to maintaining secure Preble's meadow jumping mouse populations in the Upper South Platte and Middle South Platte—Cherry Creek drainages. Should the Preble's meadow jumping mouse be delisted, management priorities on protected lands and direction of future conservation efforts would likely change. In order to ensure long-term management for the Preble's meadow jumping mouse, the Preliminary Draft Recovery Plan suggests the Service and our partners develop and implement long-term management plans and cooperative agreements prior to delisting (Service 2003b, pp. iv, 33, 39, 47–47, 51–52).

Larimer County has acquired or secured easements to considerable lands, including some properties under the Laramie Foothills Project, in partnership with The Nature Conservancy, the City of Fort Collins, and the Legacy Land Trust. While conservation efforts have increased, especially in the Livermore Valley, residential development remains the largest threat to Preble's in the county (Pague 2007). The extent to which Preble's meadow jumping mouse populations are supported by these properties, the fate of remaining private lands in the North Fork Cache La Poudre River and its tributaries, and the ability to link conservation lands and traditional agricultural lands supporting the Preble's meadow jumping mouse along stream reaches are key to protecting the potentially large Preble's meadow jumping mouse population thought to exist in this area.

The City of Boulder, Boulder County, and Jefferson County have extensive lands protected under their open-space programs. While the extent of known Preble's meadow jumping mouse occurrences in these counties is limited compared to that documented in Larimer and Douglas Counties, known populations exist on open space protected from residential and commercial development.

Summary. In the absence of the Act's protective measures, Federal conservation efforts for the Preble's meadow jumping mouse would be

largely limited to Federal properties, where the subspecies may be maintained as a priority subspecies and conserved through existing or future management plans.

While state regulations in both Colorado and Wyoming would regulate killing of Preble's meadow jumping mice, as noted in Factor B above, we do not view this as a significant concern driving the subspecies long-term conservation status. If delisted, State and local regulations would do little to conserve the Preble's meadow jumping mouse or its habitat on private lands. Public land holdings, conservation easements, and other conservation efforts, past and future, could support the Preble's meadow jumping mouse on specific sites.

In Colorado, the extent and pattern of conservation efforts in relation to Preble's meadow jumping mouse distribution, and the appropriate management of Preble's meadow jumping mouse habitat, would largely dictate the long-term viability of Preble's meadow jumping mouse populations. At this time, no large populations and few medium populations, as described in the Preliminary Draft Recovery Plan, are known to exist in Colorado on contiguous stream reaches that are secure from development. Management plans that specifically address threats to the Preble's meadow jumping mouse are few, and management priorities would likely change if we were to delist the subspecies. Much of the intervening private lands would likely be subject to development within the foreseeable future (this issue is described in more detail in Factor A above). If we were to delist the subspecies, given current and projected levels of protections, we believe that most Preble's meadow jumping mouse populations in Colorado would not be secure into the foreseeable future.

In Wyoming, the best available scientific and commercial information suggests that at least one large population and two medium populations occur in the State as recommended in the Preliminary Draft Recovery Plan (Service 2003b, pp. 19, 22). While regulatory measures in Wyoming do not guarantee protection of these populations, such assurances are not needed because threats to the Preble's meadow jumping mouse and the subspecies' habitat are limited for the foreseeable future.

E. Other Natural or Manmade Factors Affecting the Subspecies' Continued Existence

At the time of listing, we judged this subspecies susceptible to a number of other factors, including impact from naturally occurring events such as fire and flooding, invasive weeds and weed control programs, pesticides and herbicides, and secondary impacts associated with human-caused development (63 FR 26517, May 13, 1998). For most of these factors, we have little more information than we had at the time of listing. Additional concerns that were not considered at the time of listing include the potential for competition between the Preble's meadow jumping mouse and the western jumping mouse, and future effects of changing climate on the Preble's meadow jumping mouse.

Flooding and fire are natural components of the Wyoming and Colorado foothills and plains, and Preble's meadow jumping mouse habitat naturally waxes and wanes with these events. While these natural events may affect Preble's meadow jumping mouse populations by killing individuals and by destroying riparian and adjacent upland habitat on which they depend, the effects to vegetation are often temporary. Normal flooding and fire events also may help maintain the vegetative communities that provide suitable habitat for the Preble's meadow jumping mouse. Increase in impervious surfaces and denuding of vegetation caused by human activity can result in increased frequency and severity of flood events and prevent the re-establishment of favored riparian communities. An extreme flood event may eliminate an entire Preble's meadow jumping mouse population in an affected stream reach or drainage.

Periodic fire may be of value in maintaining riparian, transitional, and upland vegetation within Preble's meadow jumping mouse habitat. In a review of the effects of grassland fires on small mammals, Kaufman et al. (1990) found a positive effect of fire on meadow jumping mice in one study and no effect on the species in another study. Fire may regenerate decadent willow (*Salix* sp.) stands along streams and encourage higher stem densities considered more favorable to the Preble's meadow jumping mouse.

Long periods of fire suppression result in fuel build-up, especially in forested areas, and can result in catastrophic fires that alter habitat dramatically, change the structure and composition of the vegetative communities, and potentially affect large numbers of Preble's meadow jumping mice or multiple populations. Following more intense fires, precipitation in a burned area may degrade Preble's meadow jumping mouse habitat by causing greater levels of flooding, erosion, and sedimentation along creeks. As habitat redevelops, it will likely be reoccupied by the Preble's meadow jumping mouse, assuming that there are occupied, connected stream reaches where sufficient Preble's meadow jumping mouse populations have continued to persist.

An example of catastrophic fire in Preble's meadow jumping mouse habitat occurred in 2002. The Hayman and Schoonover fires in Jefferson and Douglas Counties, Colorado, encompassed over 3,000 ha (7,500 ac) of potential Preble's meadow jumping mouse habitat, or approximately 20 percent of the potential habitat within the boundaries of Pike National Forest (Mike Elson 2003). Approximately 342 ha (844 ac) of proposed critical habitat were burned. While riparian habitat that was lightly burned was expected to recover relatively quickly, increases in erosion and sedimentation downstream have been severe, and may continue to affect Preble's meadow jumping mouse habitat for several years. Because of severe fire-related impacts, we withdrew from the final critical habitat designation for the Preble's meadow jumping mouse (68 FR 37275, June 23, 2003) a portion of Gunbarrel Creek that we had proposed as critical habitat for the subspecies before the Hayman fire. Even prior to the Hayman and Schoonover fires, Pague and Granau (2000) considered catastrophic fire to be a high-priority issue for Douglas County.

We believe fire has the potential to affect the Preble's meadow jumping mouse populations both directly and indirectly. The intensity, extent, and location of any fire event will likely dictate the severity of the impact to the Preble's meadow jumping mouse. Catastrophic fire events are, by their nature, rare.

Invasive, noxious plants can encroach upon a landscape, displace native plant species, form monocultures of vegetation, and may negatively affect food and cover for the Preble's meadow jumping mouse. The control of noxious weeds may entail large-scale removal of vegetation and mechanical mowing operations, which also may affect the Preble's meadow jumping mouse. The tolerance of the Preble's meadow jumping mouse for invasive plant species remains poorly understood. Leafy spurge (*Euphorbia esula*) may form a monoculture, displacing native vegetation and thus reducing available

habitat (Selleck et al. 1962; Pague and Grunau 2000, p. 1–18). Nonnative species including tamarisk (*Tamarix ramosissima*) and Russian olive (*Elaeagnus angustifolia*) may adversely affect the Preble's meadow jumping mouse (Garber 1995, p. 16; Pague and Grunau 2000, p. 1–18). Existing special regulations at 50 CFR 17.40(1) exempt take incidental to noxious weed control. We instituted this exemption to recognize that control of noxious weeds is likely to produce long-term benefits to native vegetation supportive of the Preble's meadow jumping mouse.

It remains unknown to what extent point and non-point source pollution (sewage outfalls, spills, urban or agricultural runoff) that degrades water quality in potential habitat may affect the abundance or survival of the Preble's meadow jumping mouse. Likewise, it is unknown whether pesticides and herbicides, commonly used for agricultural and household purposes within the range of the Preble's meadow jumping mouse, pose a threat to Preble's meadow jumping mice directly, or through their food supply, including possible bioaccumulation.

Human-caused development creates a range of additional potential impacts (through human presence, noise, increased lighting, introduced animals, and the degradation of air and water quality) that could alter Preble's meadow jumping mouse behavior, increase the levels of stress, and ultimately contribute to loss of vigor or death of individuals, and extirpation of populations. Introduced animals associated with human development may displace, prey upon, or compete with the Preble's meadow jumping mouse. Feral cats and house mice were common in and adjacent to historical capture sites where Preble's meadow jumping mice were no longer found (Ryon 1996, p. 26). While no cause and effect relationship was documented, the Preble's meadow jumping mouse was 13 times less likely to be present at sites where house mice were found (Clippinger 2002, p. 104). We have an incomplete understanding of the mechanisms by which the breadth of human-caused development impacts Preble's meadow jumping mouse populations. However, the absence of Preble's meadow jumping mouse populations in portions of Colorado drainages where riparian habitat appears relatively favorable but human encroachment is pervasive suggests a potential cause-and-effect relationship. A combination of factors in addition to habitat loss may contribute to local extirpations.

Colorado's Comprehensive Wildlife Conservation Strategy lists ''scarcity'' as a threat to meadow jumping mice that may lead to inbreeding depression (CDOW 2006, p. 102). Small populations can be threatened by stochastic, or random, changes in a wild population's demography or genetics (Brussard and Gilpin 1989, pp. 37–48; Caughley and Gunn 1996, pp. 165–189). A stochastic demographic change in small populations, such as a skewed age or sex ratio (for example, a loss of adult females), can negatively affect reproduction and increase the chance of extirpation. Isolation of populations may disrupt gene flow and create unpredictable genetic effects that could impact Preble's meadow jumping mouse persistence in a given area. While the susceptibility of the Preble's meadow jumping mouse to such events has not been researched, the documented tendency for Preble's meadow jumping mouse populations to vary widely over time heightens concern for small and isolated populations. The lowest population numbers of Preble's meadow jumping mice more accurately reflect potential vulnerability than typical or average population numbers present. Although many trapping efforts have targeted Preble's meadow jumping mice in small, isolated reaches of habitat, few have documented presence. As noted above, we believe populations in Colorado would be at higher risk because development pressures in this portion of the range are more likely to result in small, fragmented and unsustainable populations.

The relative ranges, abundance, and relationship between the Preble's meadow jumping mouse and the western jumping mouse are not yet clearly understood, especially in Wyoming. Recent confirmation of extensive range overlap in Wyoming and the apparent predominance of the western jumping mouse in some southern Wyoming drainages with few or no Preble's meadow jumping mice, provide reason for concern. It is unknown whether western jumping mice are actively competing with Preble's meadow jumping mice, affecting Preble's meadow jumping mouse population size and possibly limiting distribution, or if this distribution patterns is unrelated to their interaction. Additional study of this issue would be desirable. Although questions remain, we do not have sufficient information to indicate this is a threat to the Preble's meadow jumping mouse in any portion of its range.

Impacts to the Preble's meadow jumping mouse under predicted future climate change are unclear. A trend of warming in the mountains of western North America is expected to decrease snowpack, hasten spring runoff, and reduce summer flows (Intergovernmental Panel on Climate Change 2007, p. 10). Increased summer heat may increase the frequency and intensity of wildfires (Intergovernmental Panel on Climate Change 2007, p. 14). Stream-flow reductions or seasonal changes in flow due to climate change will probably cause a greater disruption in watersheds with a high level of human development than in those with a lower level of development (Hurd et al. 1999, p. 1402). The three major river basins that support the Preble's meadow jumping mouse have heightened vulnerability to the effects of climate change due to the degree of human development, natural variability in stream-flow, ratio of precipitation lost to evapotranspiration, and groundwater depletion (Hurd et al. 1999, p. 1404). Conflicts between human needs for water and maintenance of existing wetland and riparian habitats will be heightened. Therefore, while it appears reasonable to assume that Preble's meadow jumping mouse may be affected, we lack sufficient certainty to know how climate change will affect the subspecies.

Overall, the impacts associated with other natural or manmade factors affecting the Preble's meadow jumping mouse and the subspecies' habitat remain largely unassessed, and therefore, largely unknown. Although questions remain regarding these factors, we do not have sufficient information to indicate that these factors are a threat to Preble's meadow jumping mouse long-term conservation status. To the extent that meaningful impacts are possible, small and fragmented populations are likely to be more vulnerable.

Conclusion of the 5-Factor Analysis

Is the Subspecies Threatened or Endangered throughout ''All'' of its Range—As required by the Act, we considered the five potential threat factors to assess whether the Preble's meadow jumping mouse is threatened or endangered throughout all or a significant portion of its range. When considering the listing status of the subspecies, the first step in the analysis is to determine whether the subspecies is in danger of extinction throughout all of its range. If this is the case, then we list the subspecies in its entirety. For instance, if the threats to a subspecies are directly acting on only a portion of its range, but they are at such a large scale that they place the entire

subspecies in danger of extinction, we would list the entire subspecies.

Destruction and modification of habitat and the resulting curtailment of range is the most significant factor affecting the future conservation status of the subspecies. Within Wyoming, new distributional data and a better understanding of threats has altered our perception of the subspecies' status in this portion of its range. At the time of listing, data confirming the presence of the Preble's meadow jumping mouse was available for only a few sites in Wyoming. Since listing, additional distributional data has verified that the subspecies is widespread in the North Platte River basin with distribution across at least four drainages. Trapping efforts to date suggest that the subspecies may remain limited in number and distribution within the Wyoming portion of the South Platte River basin. An improved understanding of the subspecies' distribution suggests that historical agricultural activities, such as grazing and haying, have had a minimal impact on the subspecies to date. In short, continuation of these long-standing activities appears supportive of existing Preble's meadow jumping mouse populations. We have no indication these agricultural practices are likely to change in the foreseeable future in ways that would affect the subspecies' long-term conservation status. A low projected human population growth rate is predicted for the four Wyoming counties occupied by the Preble's meadow jumping mouse, suggesting that few development-related threats are likely in this portion of the subspecies' range into foreseeable future.

Within Colorado, riparian habitat has been severely modified or destroyed by human activities. With current and projected human population increases and commensurate increases in urban and rural development, road construction, and water use, the ongoing loss and modification of riparian habitat will continue in much of the Preble's meadow jumping mouse Colorado range. Even with protection under the Act, development in Colorado has continued to affect Preble's meadow jumping mouse habitat, both directly and indirectly. Much of the Preble's meadow jumping mouse current range in Colorado is on private land. In the absence of the Act's protections, most of this habitat would be lost or made unsuitable within the foreseeable future. While appreciable lands in Colorado supporting the Preble's meadow jumping mouse are controlled by Federal or State agencies, or have been set aside as open space by local governments, many of these areas also are likely to experience habitat degradation in the absence of the Act's protections. Some of these areas will experience negative indirect effects from upstream development. Where conservation properties are not extensive, the Preble's meadow jumping mouse populations are likely to be small, fragmented, and unsustainable. Additional recovery efforts are required to provide such extensive contiguous conservation properties in Colorado.

In contrast to Wyoming, our improved understanding of the subspecies' range in Colorado has not changed our conclusion as to the Preble's meadow jumping mouse's status in this portion of the subspecies' range. As noted above, new data have expanded the confirmed distribution of the Preble's meadow jumping mouse to include additional sites in Boulder, Douglas, El Paso, Jefferson, and Larimer Counties. Most of the newly discovered sites are subject to the same level of threats discussed above. Thus, unlike Wyoming, recently documented sites in Colorado do not meaningfully alter the future conservation status of the subspecies in this portion of its range.

Besides ''present or threatened destruction, modification, or curtailment of its habitat or range,'' a variety of other factors were considered including: Overutilization, disease, predation, fire, flooding, invasive weeds, weed control programs, pesticides, herbicides, non-point source pollution, secondary impacts associated with human-caused development, scarcity, the potential for competition between the Preble's meadow jumping mouse and the western jumping mouse, and the future effects of climate change. The threats to the Preble's meadow jumping mouse from these factors are generally poorly understood and difficult to predict. Although questions remain regarding these factors, we do not have sufficient information to indicate that these factors are a threat to the subspecies long-term conservation status. To the extent that meaningful impacts are possible, these factors are likely to be more significant in areas where development pressures have or are likely to destroy or modify habitat resulting in small and fragmented populations. Thus, we expect these issues could be meaningful as cumulative impacts in the Colorado portion of subspecies' range where development pressures are high. In Wyoming, we expect these factors will continue to have only small, localized impacts on the subspecies.

Based on a better understanding of distribution and threats, we find that the available data do not support the conclusion that the Preble's meadow jumping mouse is likely to become endangered in the foreseeable future throughout ''all'' of its range. We determine this because distributional data has verified that the subspecies is more widespread in the North Platte River basin of Wyoming than previously known, and we are not aware of any threats that are likely to have significant affects on the long-term conservation status of populations of Preble's meadow jumping mouse in Wyoming. We expect impacts to the Wyoming portion of the subspecies' range to be minor with only small and localized effects. We believe a lack of present or threatened impacts to the Preble's meadow jumping mouse in Wyoming suggests that this subspecies is neither in danger of extinction, nor likely to become endangered within the foreseeable future in this portion of its range. Threats in the Colorado portions of the subspecies' range, while severe, do not place the entire subspecies in danger of extinction within the foreseeable future. Thus, the Preble's meadow jumping mouse does not merit continued listing as threatened throughout ''all'' of its range.

Is the Subspecies Threatened or Endangered in a Significant Portion of its Range—Having determined that the Preble's meadow jumping mouse does not meet the definition of threatened or endangered in all of its range, we must next consider whether there are any significant portions of the subspecies' range that are in danger of extinction or are likely to become endangered in the foreseeable future. On March 16, 2007, a formal opinion was issued by the Solicitor of the Department of the Interior, ''The Meaning of 'In Danger of Extinction Throughout All or a Significant Portion of Its Range'' (U.S. Department of the Interior 2007). We have summarized our interpretation of that opinion and the underlying statutory language below. A portion of a subspecies' range is significant if it is part of the current range of the subspecies and is important to the conservation of the subspecies because it contributes meaningfully to the representation, resiliency, or redundancy of the subspecies. The contribution must be at a level such that its loss would result in a decrease in the ability to conserve the subspecies.

The first step in determining whether a subspecies is threatened or endangered in a significant portion of its range is to identify any portions of the range of the subspecies that warrant further consideration. The range of a subspecies can theoretically be divided

into portions in an infinite number of ways. However, there is no purpose to analyzing portions of the range that are not reasonably likely to be both significant and either threatened or endangered. To identify those portions that warrant further consideration, we determine whether there is substantial information indicating that (1) the portions may be significant, and (2) the subspecies may be in danger of extinction there or likely to become so within the foreseeable future. In practice, a key part of this analysis is whether the threats are geographically concentrated in some way. If the threats to the subspecies are essentially uniform throughout its range, no portion is likely to warrant further consideration. Moreover, if any concentration of threats applies only to portions of the range that are unimportant to the conservation of the subspecies, such portions will not warrant further consideration.

If we identify any portions that warrant further consideration, we then determine whether in fact the subspecies is threatened or endangered in any significant portion of its range. Depending on the biology of the subspecies, its range, and the threats it faces, it may be more efficient for the Service to address the significance question first, or the status question first. Thus, if the Service determines that a portion of the range is not significant, the Service need not determine whether the subspecies is threatened or endangered there; if the Service determines that the subspecies is not threatened or endangered in a portion of its range, the Service need not determine if that portion is significant.

The terms ''resiliency,'' ''redundancy,'' and ''representation'' are intended to be indicators of the conservation value of portions of the range. Resiliency of a subspecies allows the subspecies to recover from periodic disturbances. A subspecies will likely be more resilient if large populations exist in high-quality habitat that is distributed throughout the range of the subspecies in such a way as to capture the environmental variability found within the range of the subspecies. It is likely that the larger size of a population will help contribute to the viability of the subspecies overall. Thus, a portion of the range of a subspecies may make a meaningful contribution to the resiliency of the subspecies if the area is relatively large and contains particularly high-quality habitat or if its location or characteristics make it less susceptible to certain threats than other portions of the range. When evaluating whether or how a portion of the range contributes to resiliency of the subspecies, it may help to evaluate the historical value of the portion and how frequently the portion is used by the subspecies. In addition, the portion may contribute to resiliency for other reasons; for instance, it may contain an important concentration of certain types of habitat that are necessary for the subspecies to carry out its life-history functions, such as breeding, feeding, migration, dispersal, or wintering.

Redundancy of populations may be needed to provide a margin of safety for the subspecies to withstand catastrophic events. This concept does not mean that any portion that provides redundancy is per se a significant portion of the range of a subspecies. The idea is to conserve enough areas of the range such that random perturbations in the system act on only a few populations. Therefore, we must examine each area based on whether that area provides an increment of redundancy that is important to the conservation of the subspecies.

Adequate representation ensures that the subspecies' adaptive capabilities are conserved. Specifically, we should evaluate a portion to see how it contributes to the genetic diversity of the subspecies. The loss of genetically based diversity may substantially reduce the ability of the subspecies to respond and adapt to future environmental changes. A peripheral population may contribute meaningfully to representation if there is evidence that it provides genetic diversity due to its location on the margin of the subspecies' habitat requirements.

Based on the discussion above, we readily identified the Colorado portion of the current range of the Preble's meadow jumping mouse as warranting further consideration to determine if it is a significant portion of the range that is threatened or endangered. Even with the new information confirming the extent of the range in Wyoming, the range in Colorado still constitutes the bulk of the current range, and the threats are largely concentrated in that portion.

We had to consider the question of how to define the portion of the current range that we would consider further. We concluded that it was appropriate to consider all of the current range in Colorado as a single portion of the range for the purpose of this analysis. We believe the Wyoming/Colorado State line is an appropriate delineation for separating the populations in the two States here because the respective threats to the subspecies appear to be significantly different in the two states. While we could also consider splitting the subspecies into significant portions of the range based on river basins (i.e., only removing protections in the drainages of the North Platte River basin), we believe this would be more difficult to administer with little conservation benefit to the species. We believe removing protections in the Wyoming portion of the South Platte River basin (comprised of the Upper Lodgepole Creek drainage and portions of the Crow Creek and Lone Tree Creek drainages) would be of little biological consequence. While limited trapping data and analysis of museum specimens provide evidence of Preble's meadow jumping mouse occurrence in two of these drainages, trapping data also indicate that the western jumping mouse is much more widespread suggesting that in these drainages the Preble's meadow jumping mouse may simply be uncommon. Thus, given that any additional biological benefit to the subspecies is likely to be minimal and our assertion that the respective threats to the Preble's meadow jumping mouse appear to be significantly different in the two states we are instead proposing State lines as the northern boundary for the Colorado significant portions of range. We are accepting comments on this approach and may consider using river basins in a final rule should the available data demonstrate such an approach is more appropriate.

Within Colorado, threats to the Preble's meadow jumping mouse are comparable between the South Platte River basin and Arkansas River basin. Similarly, threats to the Preble's meadow jumping mouse are comparable north and south of Denver. Because both of these possible partitions have a comparable status, further division of the subspecies' range between these two portions of its range in Colorado is unnecessary.

Another possibility to consider is whether smaller units might be appropriate. For example, one could consider each individual drainage or each individual county. Given the best scientific and commercial information available, we do not believe such subdivisions would result in units that would each meaningfully contribute to the representation, resiliency, or redundancy of the subspecies at a level such that its loss would result in a decrease in the ability to conserve the subspecies. In our view, only when drainages or counties are aggregated are they significant per the above definition. The most logical aggregation of drainages is basins which are already considered above. The most logical aggregation of Counties within Colorado is a north and south of Denver split which is also already considered above.

Therefore, further division of the subspecies' range within Colorado is either not appropriate or unnecessary.

To determine whether the Preble's meadow jumping mouse is threatened in any significant portion of its range, we first consider how the concepts of resiliency, representation, and redundancy apply to the conservation of this particular subspecies. The Preble's Meadow Jumping Mouse Preliminary Draft Recovery Plan provides some perspective. The Preliminary Draft calls for populations across the current range of the subspecies and because the Preble's meadow jumping mouse is a riparian-associated subspecies, contends that river drainages provide an appropriate geographic scale and unit for addressing their conservation. The Preliminary Draft states (Service 2003b, p. 20), ''Species well-distributed across their historical range are less susceptible to extinction and more likely to reach recovery than species confined to a small portion of their range. Distributing populations throughout different drainages reduces the risk that a large portion of the range-wide population will be negatively affected by any particular natural or anthropogenic event at any one time. Spreading the recovery populations across hydrologic units throughout the range of the subspecies also preserves the greatest amount of the remaining genetic variation, and may provide some genetic security to the range-wide population.''

In this case, projected losses of habitat in Colorado would meaningfully affect the representation, resiliency, or redundancy of the subspecies, making this portion of the range a significant portion of the range. The Colorado portion of the range includes:

- Two of the 3 river basins within the subspecies' range, amounting to approximately 65 percent of the subspecies' habitat by river-mile and total acreage (67 FR 47154, July 17, 2002);
- Thirteen (11 for which trapping has confirmed presence) of the 19 drainages comprising the range of the Preble's meadow jumping mouse (each of which should, according to the Preliminary Draft Recovery Plan, contain at least one population in order to achieve representation, resiliency, and redundancy) including 3 of the 4 recommended large populations and 3 of the 5 recommended medium populations (Service 2003b, p. 22); and
- Genetic material substantially unique within the range of the Preble's meadow jumping mouse (King et al. 2006b, pp. 4336–4347).

In conclusion, we believe that loss of the Preble's meadow jumping mouse within Colorado would result in a decrease in the ability to conserve the subspecies. We have determined that, based on its importance to the conservation of the subspecies and because it contributes meaningfully to Preble's meadow jumping mouse representation, resiliency, or redundancy, the Colorado portion of the range constitutes a significant portion of the subspecies' range as described in the Act.

If we identify any portions as significant, we then determine whether in fact the subspecies is threatened or endangered in this significant portion of its range. This determination involves weighing the magnitude and immediacy of the threats. In our view, the cumulative magnitude of threat within Colorado is very high. Immediacy will vary geographically across the range. Some areas will be subject to imminent threats that would, in the absence of the Act's protections, extirpate populations in the near future. In other areas, direct and indirect impacts, in the absence of the Act's protections, will not result in extirpation for some time. Thus, based on the best scientific and commercial information available, we find that the Preble's meadow jumping mouse is likely to become endangered within the foreseeable future throughout the Colorado portion of its range.

In conclusion, the best scientific and commercial data suggest that the Preble's meadow jumping mouse is not likely to become endangered in the foreseeable future throughout all of its range. We base this conclusion primarily on a lack of present or threatened impacts to the Preble's meadow jumping mouse or its habitat in Wyoming. Threats in the Colorado portions of the subspecies' range, while severe, do not place the entire subspecies in danger of extinction within the foreseeable future. However, based on the magnitude of development threats and other pressures to the populations throughout the Colorado portion of the range, and the lack of effective regulatory mechanisms in the absence of the Act's protective measures, we conclude that the significant portion of the subspecies' range within Colorado continues to meet the definition of threatened under the Act, and should remain listed. Therefore, we propose to amend the listing for the Preble's meadow jumping mouse to specify that the subspecies is threatened in the Colorado portion of its range only.

Significant Portion of the Range Where the Subspecies Is Threatened—We propose to amend the list to specify that the Preble's meadow jumping mouse is threatened in a significant portion of its range. Therefore, we must describe that portion because it is the area where the protections of the Act would remain in place. As previously stated the range of a species is the general area in which the species can be found, including migratory corridors, seasonal habitats, and habitats used on a regular, though not necessarily seasonal, basis.

The scale at which one defines the range of a particular species is fact and context dependant. In other words, whether one defines the range at a relatively course or fine scale depends on the life history of the species at issue, the data available, and the purpose for which one is considering range.

The Preble's meadow jumping mouse is secretive, almost never observed without trapping, and relatively rare even where present. Confirmed occupancy is based almost entirely on intensive trapping efforts, requiring hundreds of traps set over multiple nights. Preble's meadow jumping mice are able to move miles along stream corridors over their lifetime (Ryon 1999; Shenk and Sivert 1999a), typically utilizing riparian (river) corridors. Although the subspecies commonly uses riparian vegetation immediately adjacent to a stream, other features that provide habitat for the subspecies include seasonal streams (Bakeman 1997), low moist areas and dry gulches (Shenk 2004), agricultural ditches (Meaney et al. 2003), and wet meadows and seeps near streams (Ryon 1996). Given records of confirmed presence and patterns of existing riparian habitat, we can draw inferences as to what we would consider occupied drainages or portions of these drainages.

To date, aside from some earlier work from Colorado Department of Wildlife and the Colorado Natural Heritage Program, the objective of most trapping surveys has not been to document the limits of occupied habitat in Colorado. While much of the Preble's meadow jumping mouse's distribution is on private lands, most trapping surveys on private lands have been conducted by consultants based on anticipated development of the property by landowners (in compliance with section 7 of the Act). This has resulted in far more trapping within the expanding development corridor than in rural lands where no current development is planned. Therefore, we have less assurance of current presence or potential absence of the Preble's meadow jumping mouse in areas east, south and west of the development corridor.

Trapping can only confirm presence, not prove absence. At some sites, researchers have seen dramatic changes in estimated populations from season to season and year to year. A single trapping effort in any presumed occupied site could be unsuccessful if it corresponded to times when few or no animals are present. There is speculation that the Preble's meadow jumping mouse may move in and out of areas (individuals have been shown to move miles along stream corridors over their lifetime). In areas within the range of the subspecies, multiple trap efforts in a drainage or portions of a drainage are needed to provide strong evidence that Preble's meadow jumping mice are likely absent. Again, in many areas outside the Front Range development corridor trapping has been more limited and in some areas where presence has not been confirmed by trapping, we do not believe trapping data is determinative of Preble's presence at particular sites, much less whole drainages of portions thereof .

As with other determinations under the Act, we do not define the current range on the basis of conclusive evidence; rather, we use the best available data. The purpose of defining range (and hence the significant portion of the range) is to set the boundaries of the protections of the Act. Therefore, defining the boundaries too narrowly may lead to the failure to protect some Preble's meadow jumping mice. On the other hand, drawing the boundaries relatively expansively will not lead to unnecessary expense on the part of the Service or the public because, as described in detail below, existing guidance on block clearance zones will remain in place. Therefore, in the context of describing the current range for the purpose of defining the scope of the listing for the Preble's meadow jumping mouse, we have determined that it is appropriate to use a relatively coarse scale to capture all of the areas where the best available data suggests the Preble's meadow jumping mouse is likely to occur.

The Preliminary Recovery Plan suggests maintaining at least one recovery population within each drainage (to provide resiliency, representation, and redundancy) within the existing range of the subspecies. The Preliminary Recovery Plan, which represents the best available science, identifies thirteen drainages that comprise the area significant to the conservation of the subspecies including Big Sandy, Big Thompson, Bijou, Cache La Poudre, Clear Creek, Crow Creek, Fountain Creek Chico, Kiowa, Lone-Tree Owl, Middle South Platte—Cherry Creek, Saint Vrain, and Upper South Platte (as illustrated in figure 2). Recognizing that complete information is currently lacking that would definitively confirm the presence of existing Preble's meadow jumping mouse populations and suitable habitat in some drainages, these drainages have been included in the Preliminary Recovery Plan as representative of the current range of the subspecies on the presumption that at least a small population occurs in each. The intent of the Preliminary Recovery Plan was to preserve populations throughout the existing range to maximize the preservation of the remaining genetic diversity that may be present.

For convenience in distinguishing this boundary on-the-ground we employ latitude and longitude coordinates. We believe the latitude and longitude boundaries below provide an appropriate delineation for the significant portion of the Preble's meadow jumping mouse range in Colorado. These boundaries are inclusive of all areas likely to support Preble's meadow jumping mouse populations in Colorado. As a result, all records confirming Preble's meadow jumping mouse occurrence in Colorado are captured within these boundaries. We believe that it is highly unlikely that there will be discovery of currently existing Preble's meadow jumping mouse populations outside these boundaries in Colorado. Therefore, we believe removing protections outside these boundaries would be of little biological consequence. Thus, based on best available data, we have identified the portion of Colorado west of 103 degrees 40 minutes West, north of 38 degrees 30 minutes North, and east of 105 degrees 50 minutes West as the significant portion of the range of the subspecies (illustrated in figure 2).

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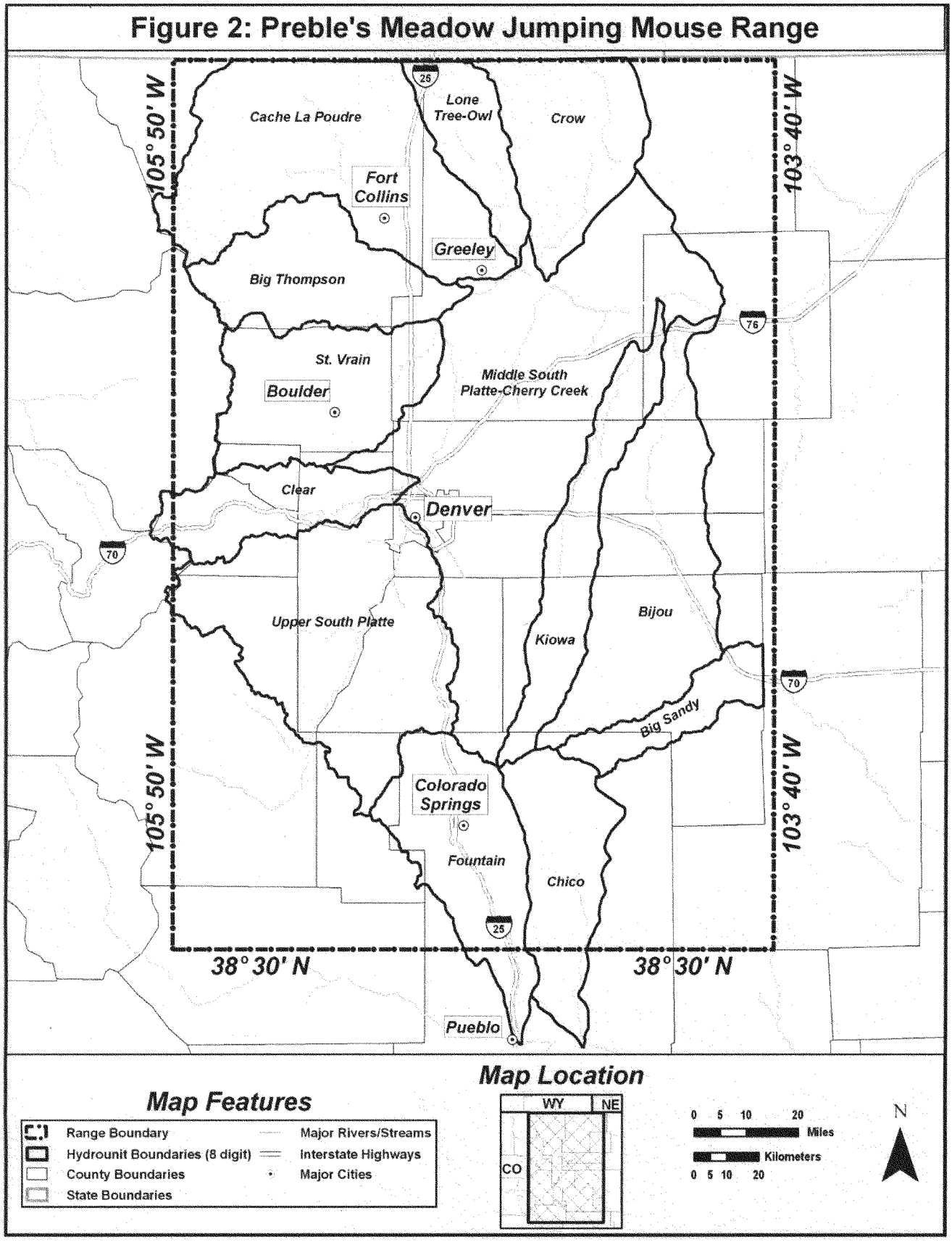

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Eastern boundary *(103 degrees, 40 minutes west)*—This boundary is inclusive of all areas within the current survey guidelines (east to a north-south

line through Fort Morgan, Morgan County) and also includes the eastern extent of the Big Sandy drainage (designated in the draft of the recovery plan).

Southern Boundary *(38 degrees, 30 minutes north)*—This boundary is inclusive of all areas within the current survey guidelines (south including all of El Paso County) and also includes the majority of the Fountain Creek and Chico Creek drainages (designated in the draft of the recovery plan). Habitat in the southern portion of El Paso County is limited. The small portions of the Fountain and Chico drainages that fall outside the boundary are outside the current survey guidelines and believed not to support Preble's.

Western boundary *(105 degrees 50 minutes west)*—This boundary is inclusive of elevations to 7,600 feet (2,316 meters) in the Cache La Poudre River, Clear Creek and Upper South Platte drainages and all portions of the Big Thompson and St. Vrain drainages.

Administrative Processes—As part of our management of the subspecies on-the-ground within this significant portion of range area, the Service will continue to utilize block clearance zones to eliminate unnecessary processes (e.g., compliance with section 7 of the Act) while protecting the listed species. In designating a block clearance zone, the Service eliminates the need for individuals or agencies to coordinate with the Service prior to conducting activities at locations within the Preble's meadow jumping mouse range. The establishment of these block clearance zones is based on the likely absence of the subspecies within the area, and little likelihood that any of the area would be of importance to the recovery of the subspecies. Block clearance zones have been approved for the Denver metropolitan area (including most of Denver County and portions of Adams, Arapahoe, Boulder, Broomfield, Douglas, and Jefferson Counties) and along Monument, Cottonwood, and Sand Creeks in the Colorado Springs area. While this substantially reduces the regulatory burden, should an individual Preble's meadow jumping mouse be found in a block-cleared area, it would be fully protected under the Act. In addition, outside of the block clearance zone, but within the SPR, we would continue to identify, on a project-by-project basis, whether surveys for the Preble's meadow jumping mouse are needed based on whether suitable habitat is present within the action area of the project.

We considered excluding block clearance zones from the listing as outside the current range of the subspecies, but we believe that approach would be impractical and ill-advised. For example, Preble's meadow jumping mouse block clearance zones expand on a near annual basis. If a revision to the Code of Federal Regulations was required to achieve this revision, the process would require annual proposed and final rules. This would be both unwieldy from a workload perspective and result in an unnecessary delay in reducing our regulatory oversight as this process typically takes a year to complete. Furthermore, the listing backlog (i.e., a shortfall of funds that preclude the listing of species that are warranted-but-precluded from threatened or endangered status and the designation of critical habitat) would preclude relisting areas even if future information suggests the area was removed prematurely (unless emergency listing was deemed appropriate). This double standard as well as the difficult and time-consuming nature of the process suggests this approach is not realistic, not desirable, and inappropriate. As we have in the past, the Service will consider modification of the current block-clearance zones, or the addition of new zones, when the available data demonstrate such an action is appropriate.

The above discussion relating to specifying a significant portion of the range of the Preble's meadow jumping mouse as threatened represents our current thinking based on the data we now have available. However, this is our first proposal to specify such a portion since issuance of the opinion of the Solicitor's Office on this topic on March 16, 2007. Thus, we note that we will be considering alternative formulations and analyses before issuing a final determination, and the final determination may vary in its particulars from this proposed rule.

We particularly invite data, analyses, and other comments regarding the following issues:

(1) What is the current range of the Preble's meadow jumping mouse? In the absence of confirmation of presence of Preble's meadow jumping mouse by trapping, what information is sufficient for the Service to determine that, based on the best data available, an area is part of the current range of the subspecies?

(2) On how fine or coarse a scale should we define the portion of the range that we may specify as both significant and threatened? Theoretically, the scale could be as coarse as the entire state of Colorado, or as fine as the scale used in critical habitat designations. For the reasons discussed above, this proposed rule is based on an intermediate scale.

(3) How should the boundaries of the portion of the range at issue be defined? By latitude and longitude lines? By drainage boundaries? By county lines? By reference to particular streams? By some other means?

(4) Is it appropriate to use the Colorado/Wyoming border to divide the range of the subspecies? If the Preble's meadow jumping mouse in particular sites within Colorado (particularly those adjacent to the border with Wyoming) are not threatened, should they be included within the significant portion of the range specified as threatened? Likewise, if the Preble's meadow jumping mouse in particular sites within Wyoming (particularly those adjacent to the border with Colorado) are threatened, should they be included within the significant portion of the range specified as threatened?

(5) If we use a relatively coarse scale to define the current range of the subspecies, how should we address an area within that range if we have information suggesting that the subspecies does not currently occupy—or has never actually occupied—that particular area within its overall range? Should those areas be geographically excluded from the significant portion of the range specified as threatened? Or are those areas best addressed through administrative implementation, such as the block clearance zones described above? What impacts to the subspecies, the public, and the Service will result from employing each of the possible strategies?

(6) If we determine to define the portion of the range specified as threatened as excluding areas (at the appropriate scale) that the best data available suggests are not currently occupied by the Preble's meadow jumping mouse, how should we do that? Should such areas (for example, parts of the Denver metropolitan area) be mapped, or excluded by narrative text? What sort of boundaries would be available for defining such areas as not part of the range specified as threatened? What purposes would be served by adding to the complexity of the listing rule? What purposes would be served by reducing the complexity of the listing rule?

(7) Is it appropriate to aggregate all of the current range of the Preble's meadow jumping mouse in Colorado into one portion for the purpose of this analysis? If particular sites within Colorado are not independently significant portions of the range of the Preble's meadow jumping mouse, should they still be considered part of

the portion of the range that is collectively significant?

Depending on the comments received during the public comment period and our further analysis of these issues, the final determination could incorporate any of the possible answers to these questions.

Effects of the Proposed Rule

If finalized, this action would amend the listing for the Preble's meadow jumping mouse by specifying that the subspecies is threatened in the Colorado portion of its range. This action also would eliminate critical habitat (June 23, 2003, 68 FR 37275) in Wyoming. Additionally, the take exemptions of the 4(d) species rule would no longer be necessary, and therefore would no longer apply, in Wyoming (May 22, 2001, 66 FR 28125; October 1, 2002, 67 FR 61531; May 20, 2004, 69 FR 29101). Thus, the prohibitions and conservation measures provided by the Act would no longer apply to this subspecies in Wyoming. Federal agencies would no longer be required to consult with us to insure that any action they authorize, fund, or carry out in Wyoming would not likely jeopardize the continued existence of the subspecies or result in destruction or adversely modify critical habitat in Wyoming. However, to the extent an activity in Wyoming would adversely affect the subspecies or critical habitat within its range listed in Colorado, consultation under section 7 would still be required.

Future Conservation Measures

No specific preservation or management programs exist for the Preble's meadow jumping mouse in Wyoming. We believe that sufficient habitat will remain in Wyoming over the foreseeable future to allow for the continued viability of this subspecies. In the significant portion of the range within Colorado, the Preble's meadow jumping mouse would continue to be protected under the Act.

Peer Review

In accordance with our peer review policy published in the **Federal Register** on July 1, 1994 (59 FR 34270) and the Office of Management and Budget's (OMB) Final Information Quality Bulletin for Peer Review, we seek the expert opinions of appropriate and independent specialists regarding this proposal. In this case, we will seek the comments of two sets of reviewers. First, we will contact the same five experts invited to provide comments on the previous proposed rule (70 FR 5404, February 2, 2005; 71 FR 8556, February 17, 2006; 71 FR 16090, March 30, 2006). The selected reviewers were selected for their expertise in genetics, systematics, and small mammals. We will ask these reviewers to review this proposal's taxonomic discussion. Second, we will contact an additional five experts to review the remainder of this proposal. We will select reviewers for expertise in small-mammal biology, riparian-community ecology and status, population dynamics and extinction risk, and/or development trends and land-use conflicts. The purpose of such review is to ensure that we base our final decision on scientifically sound data, assumptions, and analyses. We will send copies of this proposed rule to these peer reviewers immediately following publication in the **Federal Register**. We will invite these peer reviewers to comment, during the public comment period, on the specific assumptions and conclusions regarding our revised proposal. We will consider all comments and information received during the comment period on this proposed rule during preparation of a final rulemaking. Accordingly, the final decision may differ from this proposed rule.

Clarity of the Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

(a) Be logically organized;

(b) Use the active voice to address readers directly;

(c) Use clear language rather than jargon;

(d) Be divided into short sections and sentences; and

(e) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in the **ADDRESSES** section. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

Energy Supply, Distribution, or Use

On May 18, 2001, the President issued an Executive Order (E.O. 13211; Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use) on regulations that significantly affect energy supply, distribution, and use. The E.O. 13211 requires agencies to prepare Statements of Energy Effects when undertaking certain actions. As this proposed rule is not expected to significantly affect energy supplies, distribution, or use, this action is not a significant energy action and no Statement of Energy Effects is required.

Paperwork Reduction Act

This proposed rule does not contain any new collections of information that require approval by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*). This proposed rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

National Environmental Policy Act

The Service has determined that Environmental Assessments and Environmental Impact Statements, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Act. We published a notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

References

A complete list of all references cited herein is available upon request from the Colorado Field Office (see **ADDRESSES**).

Author

The primary authors of this document are staff located at the Colorado Field Office (see **ADDRESSES**).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and record keeping requirements, Transportation.

Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations as set forth below.

PART 17—[AMENDED]

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500; unless otherwise noted.

2. Amend § 17.11(h) by revising the entry for ''Mouse, Preble's meadow jumping'' under ''MAMMALS'' in the

List of Endangered and Threatened Wildlife to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
Mammals							
*	*	*	* *		*		*
Mouse, Preble's meadow jumping.	*Zapus hudsonius preblei*.	U.S.A. (CO, WY)	U.S.A., north-central CO (that portion of Colorado west of 103 degrees 40 minutes West, north of 38 degrees 30 minutes North, and east of 105 degrees 50 minutes West).	T	636	17.95(a)	17.40(l)
*	*	*	* *		*		*

3. Amend § 17.40(l) as follows:

a. By revising paragraph (l)(2)(vi)(E) to read as set forth below; and

b. By revising paragraph (l)(4) to read as set forth below.

§ 17.40 Special rules—mammals.

* * * * *

(l) * * *

(2) * * *

(vi) * * *

(E) Any future revisions to the authorities listed in paragraphs (l)(2)(vi)(A) through (D) of this section that apply to the herbicides proposed for use within the species' range as specified in § 17.11(h).

* * * * *

(4) *Where does this rule apply?* The take exemptions provided by this rule are applicable within the range of the Preble's meadow jumping mouse as specified in § 17.11(h).

* * * * *

§ 17.95 [Amended]

4. In § 17.95(a), amend the entry for ''Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*)'' by removing paragraphs (4) through (7), and by redesignating paragraphs (8) through (13) as (4) through (9), respectively.

Dated: October 30, 2007.

H. Dale Hall,

Director, U.S. Fish and Wildlife Service.

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