



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

IN REPLY REFER TO:
ES/CO: T&E/PMJM/Other
MS 65412 Lkwd

May 15, 2004

To Whom It May Concern:

Based on the authority conferred to the U.S. Fish and Wildlife Service (Service) by the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*), the Service has reviewed and modified the recommendations and guidelines for surveys to determine the presence or absence of the Preble's meadow jumping mouse, *Zapus hudsonius preblei* (Preble's), in Colorado and southeastern Wyoming, previously revised on May 19, 1999.

These guidelines were developed by the Service, in consultation with other biologists, ecologists, and researchers knowledgeable about this subspecies, to gain more information about the subspecies, identify potential habitats, ensure protection of individuals of this subspecies during surveying efforts, educate potential surveyors and other interested parties on the ecology of Preble's, and streamline and standardize survey procedures. Furthermore, these guidelines were developed, and revised, as the minimum standard that the Service will require in order to accept the validity of surveys and survey reports prepared for Preble's.

The Service recommends that this letter of notification and accompanying revised guidelines be copied and distributed to anyone planning a project in areas that meet the description of potential Preble's habitat as described in the guidelines.

If we can be of further assistance, please contact Peter Plage of my staff at (303) 275-2370.

Sincerely,

[Signed]

Susan C. Linner
Colorado Field Supervisor

PREBLE'S MEADOW JUMPING MOUSE (*Zapus hudsonius preblei*)
SURVEY GUIDELINES
- REVISED APRIL 2004 -

These survey guidelines supersede previous versions.

On May 13, 1998, the U.S. Fish and Wildlife Service (Service) issued a final rule to list the Preble's meadow jumping mouse, *Zapus hudsonius preblei* (Preble's), as a Federally-threatened species under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et. seq.) (Act). The Service has established recommendations and guidelines for surveys to determine the presence or absence of Preble's and Preble's habitat and to serve as the basis for more comprehensive research. These guidelines were developed by the Service, in consultation with other biologists, ecologists, and researchers knowledgeable about this subspecies, to gain more information about the subspecies, identify potential habitats, ensure protection of individuals of this subspecies during surveying efforts, educate potential surveyors and other interested parties on the ecology of Preble's, and streamline and standardize survey procedures. Furthermore, these guidelines were developed as the minimum standard that the Service would require, in order to accept the validity of surveys and survey reports prepared for Preble's.

Highlights of changes from the 1999 Survey Guidelines:

- * There is a new Survey Field Data Compilation Form for 2004. This form must be completed for every Preble's trapping survey and site assessment, including site disqualification requests, and must be presented when submitting trapping or assessment reports. Electronic copies of blank data forms can be obtained at the Service web site <http://www.r6.fws.gov/preble>.
- * Surveys (assessments and trapping) will be considered valid for one year. If disturbance or development does not occur within one year from the date of written approval from the Service, the appropriate Service Field Office must be contacted to request a clearance extension.
- * There are 3 established Block Clearance Areas for Preble's within Colorado. Any development or construction projects located within the clearance boundaries are exempt from further review for Preble's habitat for as long as the clearance designation is valid. Further information on the clearance areas can be found at the Service web site <http://www.r6.fws.gov/preble>.
- * For trapping surveys in Colorado, a copy of the survey report must be submitted to the Colorado Natural Heritage Program only if the survey results in the capture of one or more jumping mice.

Reminders:

* For trapping surveys in Wyoming, a copy of the survey report must be forwarded to the Wyoming Natural Diversity Database.

* Documentation of compliance with survey guidelines is accomplished through submission to the Service of a survey report. The Service will respond with a letter indicating acceptance or rejection of the report, usually within 30 days of receipt.

* A provision of each Service-authorized permit for trapping Preble's is that an annual report of activities conducted under the permit be submitted to the appropriate Service Field Office before December 31 of each calendar year. Even if you did not conduct field work under your permit you must file a report for each calendar year.

It is imperative that all project proponents are aware of the presence or potential presence of Preble's. Section 9(a)(1) of the Act prohibits the take (i.e., harass, harm, pursue, hunt, shoot, kill, wound, trap, capture, or collect, or to attempt to engage in any such conduct) of federally-endangered or threatened species, except as provided in sections 6(g)(2) and 10 of the Act. By following these guidelines, a project proponent can reduce the likelihood that their actions will result in a violation of the Act.

All Federal agencies have responsibility under section 7(a)(1) of the Act to protect endangered and threatened species and the habitats on which they depend. For projects where a Federal nexus exists (Federal permit, Federal funding, projects on Federal land) and there is a potential effect to Preble's or its habitat, the Federal action agency must contact the Service. In addition, the Service encourages all Federal land-holding agencies to review their properties and projects and make funds available to conduct Preble's surveys in all potential habitat.

For trapping surveys, documentation of compliance with these guidelines is accomplished through the required submission to the appropriate Service Field Office (Colorado or Wyoming) of an original trapping survey report within 30 days after the completion of the survey. For all site surveys resulting in requested disqualification from trapping, we strongly recommend that an original report be submitted within 30 days of site inspection. For proposed projects requiring a U.S. Army Corps of Engineers (Corps) permit, the appropriate Corps office should be sent a copy of any report. The Service will review submitted reports and reply with a written letter of acceptance or rejection of the report, usually within 30 days of receipt of the report.

A completed Survey Field Data Compilation Form is required for trapping surveys, habitat evaluations, including site disqualification requests, and injury or mortality documentation. Please submit the completed form with the trapping or assessment reports. Electronic copies of the blank form are available on the Service web site <http://www.r6.fws.gov/preble>.

These guidelines will be reviewed and modified as needed. Copies of the revised guidelines will be distributed to all field biologists working in appropriate areas of eastern Colorado and southeastern Wyoming under scientific permits from the Service, the Colorado Division of Wildlife (CDOW), or the Wyoming Game and Fish Department (WGFD), and are available to anyone upon request. Copies of the guidelines will be available on the Service web site <http://www.r6.fws.gov/preble>.

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1. HABITAT DESCRIPTION

A definitive study of the ecological distribution of Preble's in Colorado and adjacent Wyoming has never been conducted. Armstrong et al. (1997) described typical Preble's meadow jumping mouse habitat as "well-developed plains riparian vegetation with relatively undisturbed grassland and a water source in close proximity." Also noted was a preference for "dense herbaceous vegetation consisting of a variety of grasses, forbs and thick shrubs." Shenk (2000) conducted radio tracking at three sites and documented greater use of upland habitats than previously assumed. Based on analysis of habitat use in Larimer County, Shenk and Eussen (1998) also noted Preble's lacks a preference "toward any single plant species but instead favors sites that are structurally diverse and provide adequate cover and food throughout its life cycle." Meaney et al. (1997) suggested that Preble's has a broader ecological tolerance than previously thought and while they require diverse vegetation and well-developed cover, this can be met in a variety of circumstances. Recent captures that were exceptions to the typical habitat described include individuals found along a small irrigation ditch and in a mesic grassy field on City of Boulder Open Space land (Clint Miller, City of Boulder, pers. com., 1996). Ensign Technical Services (1997) reported instances of Preble's trapped at or near sites of human alteration including ditches along roads and driveways, and wetlands adjacent to highways. Meaney et al. (1997) emphasized that vegetated ditches may represent adequate habitat for Preble's and may provide

dispersal routes. Shenk (1998) suggested that on a landscape scale, maintenance of acceptable dispersal corridors linking patches of Preble's habitat may be critical to its conservation.

Preble's have rarely been trapped in uplands adjacent to riparian areas (Dharman 2001). However, in detailed studies of Preble's movement patterns using radio telemetry, Preble's has been found feeding and resting in adjacent uplands (Shenk and Sivert 1999b, Ryon 1999, Schorr 2001). These studies reveal that the Preble's regularly uses uplands at least as far out as 100 meters (330 feet) beyond the 100-year floodplain (Ryon 1999, Shenk 2002). Preble's can also move considerable distances along streams, as far as 1.6 km (1.0 miles) in one evening (Ryon 1999, Shenk and Sivert 1999a).

2. QUALIFICATIONS OF SURVEYOR

While the Service does not want to exclude any qualified person from conducting trapping surveys or assessing potential Preble's habitat, the following set of criteria has been developed to demonstrate whether a surveyor is qualified to conduct trapping surveys or assess potential Preble's habitat in Colorado or Wyoming. **A Federal permit is required for all surveyors prior to initiation of trapping efforts.** Information on Federal permits and copies of electronic permit applications can be found at <http://www.permits.fws.gov> or by contacting Kris Olsen, Region 6 Permit Coordinator, (303) 236-4256. Qualification documentation must be submitted with the Federal permit application. A surveyor must also obtain a permit from Kathy Konishi, CDOW (719) 268-0143, or email kathy.konishi@state.co.us, for trapping activities in Colorado, or Russ Pollard, WGFD (307) 473-3417, for trapping activities in Wyoming.

Documentation of qualifications must include:

- A. Description of zoological/biological expertise and training (e.g., a graduate degree in ecology, botany, zoology, mammalogy, or other appropriate discipline is recommended; a bachelor of sciences in these or other related disciplines is required);
- B. Experience in conducting small mammal surveys (list dates, locations, and species included in previously conducted surveys) with emphasis on Zapus; and
- C. Actions taken to become acquainted with the known habitats, appearance of Preble's, and trapping techniques (such as reviewing existing literature on Preble's, contacting and visiting with resident zoologists and researchers knowledgeable on the subspecies, studying museum specimens and photographs of Preble's, and especially, assisting permitted Preble's surveyors during their trapping efforts);
- D. References, particularly documenting contact with known Preble's experts.

While surveys, and in particular trapping studies, often necessitate participation by more than one person, a qualified, permitted surveyor should be on site at all times during setting and checking of traps.

3. GENERAL AREAS REQUIRING A SURVEY

The following areas in Colorado and Wyoming have been determined to have high probability of occurrence of Preble's based on current and historical records of the subspecies. Surveys are recommended where suitable habitat exists (below 7,600 feet elevation in Colorado or 8,100 feet elevation in Wyoming) within these areas:

A. Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Denver, Douglas, El Paso, Elbert, Jefferson, Larimer, Morgan, Teller, and Weld Counties in Colorado, from 7600' elevation on the western boundary to a north/south line drawn through Ft. Morgan on the eastern boundary;

B. Streams and their tributaries (including 100-year floodplains and associated wet meadow complexes) in the North Platte River, South Platte River, and Lodgepole Creek drainages south of the North Platte River (northwest to approximately Douglas) below 8100' elevation in Albany, Converse, Goshen, Laramie, and Platte Counties in Wyoming.

4. SPECIFIC SITES REQUIRING A SURVEY

The Service recommends that sites below 7600' in Colorado (8100' in Wyoming) occurring within the areas described in Section 3 in or within 300 feet of the following: FEMA-designated 100-year floodplains of stream channels and their tributaries (perennial and intermittent), riparian habitats, vegetated irrigation canals, ditches, and wetlands including wet meadows (both natural and those created by seeps from man-made structures such as dams, irrigation canals and ditches, etc.), and wet or mesic alfalfa or hay fields near streams be surveyed for Preble's. It should be noted that many drainages where suitable Preble's habitat may exist do not have FEMA-designated 100-year floodplains.

Radio-tracking studies by Shenk and Sivert (1999) documented Preble's moving outward from wetlands and riparian habitats into adjacent uplands. Other radio-tracking studies have documented hibernation sites within 100 meters from creeks. **Therefore, the Service recommends that projects within 300 feet of 100-year floodplains associated with rivers, creeks, and their tributaries (and projects which may have potential secondary impacts to such areas) be assessed as to their potential direct impacts and indirect impacts (sedimentation, increased run-off, increased light pollution, etc.) to Preble's and Preble's habitat. In some instances where continuous, high-quality habitat is present, potential Preble's habitat may extend beyond 300 feet from the 100-year floodplain. Such cases may require additional assessment.**

Project sites cannot be addressed from a narrowly defined "cookbook" perspective. A series of factors influence the decision as to whether a trapping survey is required at a particular project site. These factors include but are not limited to: the quality and quantity of habitat present at the site, quality and quantity of habitat nearby (especially upstream and downstream within the same drainage), isolation or connectivity of the project site to other potential habitat, history of Preble's occurrence in the immediate area or upstream and downstream within the same

drainage, the nature of any proposed development project, and the potential extent of direct, secondary, or cumulative impacts the project may cause.

A project occurring in poor or marginal habitat, but having potential to disrupt a travel corridor (such as construction of a road crossing at a creek) may also be of concern. In such a case it may be desirable to survey higher quality habitat nearby rather than, or in addition to, surveying the immediate project site. The question of secondary impacts from proposed projects must also be considered. Projects removed from potential Preble's habitat that have the potential to adversely impact the habitat may also require a survey. For example, a residential or commercial development far uphill from a creek supporting potential Preble's habitat may significantly increase runoff or otherwise impact the hydrology and the habitat present on the creek. In such an instance, presence of Preble's within the secondary impact area should be determined.

Because of the complexities described above, a qualified, permitted surveyor familiar with Preble's and capable of assessing project impacts must make the decision as to whether a particular project requires a trapping survey. If there is a question as to whether a site requires a trapping survey, the Service recommends that the site be trapped.

5. SITES NOT REQUIRING A TRAPPING SURVEY WITH JUSTIFICATION

Some sites are either clearly not appropriate Preble's habitat or have very low potential to be Preble's habitat. A trapping survey for Preble's is not usually recommended for such sites. Sites occurring within the areas described in Section 3 and falling within general habitat guidelines as described in Section 4, which generally may not require a trapping survey for Preble's, but do require a written request for site exclusion approval from the Service, include:

- A. Irrigation ditches with little or no vegetation.
- B. Sites where wetlands are entirely composed of dense stands of cattails.
- C. Sites continually occupied by and maintained as cropland (except alfalfa and hay fields).

6. SITES AND PROJECTS NOT REQUIRING ADDITIONAL SERVICE REVIEW

A. Highly disturbed or modified sites:

- 1) Areas devoid of vegetation because of paving or other construction.
- 2) Portions of stream channels diverted underground, armored with concrete, or covered with riprap so as to exclude significant vegetation.

B. Block Clearance Zones:

There are areas designated by the Service to have little likelihood of Preble's presence based on numerous negative trapping surveys and/or habitat assessments. Any development or

construction projects located within the clearance boundaries are exempt from further review for Preble's habitat by the Service, for as long as the clearance designation is valid. These block clearance designations are temporary and will be periodically reviewed by the Service for changes, extensions, etc. Maps of each clearance area are available on the Service's web site <http://www.r6.fws.gov/preble>.

- 1) Denver Metropolitan Area (parts of Adams, Arapahoe, Boulder, Jefferson, Denver, and Douglas Counties), valid through January 2007. Generally, the limits of the block clearance are Baseline Road to the north, E-470 to the east, Lincoln Boulevard to the south, and C-470/Platte Canyon Road to the southwest. The block clearance excludes Chatfield Reservoir and Cherry Creek Reservoir State Recreation Areas.
- 2) Monument Creek/Fountain Creek (El Paso County), valid through June 2006. Exclusion area includes Monument Creek from the crossing of Interstate 25 in the north (approximately one mile south of Cottonwood Creek) to the confluence with Fountain Creek in the south, and Fountain Creek from its confluence with Monument in the north to the Wastewater Treatment Plan (approximately one mile south of the crossing of Nevada Avenue over Fountain Creek).
- 3) Colorado Springs Metropolitan Area Cottonwood Creek (El Paso County), valid through April 2005. Exclusion area includes Cottonwood Creek from the eastern crossing of Interstate 25 to the crossing of Black Forest Road in the east, and includes all tributaries of Cottonwood Creek to their headwaters.

C. Minimal or Temporary Projects:

The Service has identified development projects that will not require additional review by the Service for potential impacts to Preble's habitat based on the minimal or temporary nature of the potential impacts.

- 1) Projects that will be attached to an existing structure or within 25 feet of an existing structure (i.e., decks, home additions, garages, sunrooms, sheds).
- 2) Projects with a total new footprint of 400 square feet or less that occur outside of, but within 300 feet of, the 100-year floodplain.
- 3) Projects occurring within established maintained, landscaped (mowed) yards.
- 4) Projects occurring within areas with established privacy fences.
- 5) Construction of all non-privacy fences such as, but not limited to, wire or split rail fences within Preble's habitat, provided that fencing will not be used in conjunction with new livestock or cattle grazing practices.
- 6) Projects that occur outside of, but within 300 feet of, the 100-year floodplain but are separated from Preble's habitat by a paved road more than 25 feet wide.

D. Special Regulations Section 4(d) Final Rule:

On May 22, 2001 (FR Vol. 66, No. 99, 28129), the Service finalized a special amendment to establish protective regulations pursuant to section 9 of the Act. The rule prohibits actions that threaten the Preble's to the extent necessary to provide for the conservation of the Preble's and also provides flexibility to private landowners for ongoing activities that will not impede the conservation of the species. The following activities are exempt from the general take provisions in section 9 of the Act, provided that the activities resulting in such take are conducted in accordance with the requirements identified in this special rule. These exemptions apply anywhere within Preble's range.

- 1) Rodent control within 10 feet of, or inside of, any structure.
- 2) Ongoing agricultural activities (does not apply to new agricultural practices that increase impacts to, or further encroach upon, Preble's habitat).
- 3) Maintenance and replacement of existing landscaping and related structures and improvements.
- 4) Existing uses of water associated with the exercise of perfected water rights under State law and interstate compacts and decrees.

The Final Rule regulations were amended on October 1, 2002 to include the following activities (FR Vol. 67, No. 190, 61534).

- 5) Noxious weed control activities according to existing State laws and Federal regulations regarding herbicide labeling.
- 6) Ongoing (normal and customary) ditch maintenance activities only to manmade ditches.

This Final Rule is scheduled to sunset on May 22, 2004; however, on February 24, 2004 (FR Vol. 69, No. 36, 8359), the Service proposed to extend the special regulations permanently.

7. SURVEY METHODOLOGY, PROTOCOL, AND EQUIPMENT

The purpose of most Preble's surveys will be to determine presence or absence of the subspecies. The surveyor is responsible for obtaining the necessary trapping/collecting permit from the Service and the CDOW or WGFD. If the subspecies is found at previously undocumented sites, CDOW or WGFD, and the Service should be immediately contacted.

The surveyor should exercise care and be acquainted with and follow the Center for Disease Control's Hantavirus instructions and recommendations when dealing with rodents. Between sampling sites, traps should be disinfected to limit the potential of spreading disease from site to site. A 10 percent bleach solution may be used to disinfect traps. Traps should be thoroughly rinsed to remove the scent of the disinfectant.

Personal pets should not accompany surveyors.

Only small-mammal live traps (folding and non-folding) will be used in the surveying efforts. The recommended live-traps are the Sherman and the Longworth. Use of any other types of live-

traps or capturing devices to survey for Preble's requires clearance from the Service prior to trapping. As traps are set, they will be checked for sensitivity. Only traps in excellent condition will be used. Traps must be free of bait and debris that might interfere with action of the treadle or door. New traps will not be used until they have been "seasoned" (i.e., exposed to the natural elements, used) nor will traps be used that are contaminated with odor of disinfectants, detergents, etc.

Double trapping transects are recommended to inventory for Preble's. The traps should be set in two parallel lines of trap stations (1 trap per station). Trap stations will be 5 m apart; the parallel transects will be 10 m apart unless extent of habitat, terrain topography, or stream hydrology do not allow. Actual orientation of transects will depend upon local topography, drainage, etc. Survey methodology may be adapted to best cover individual project sites.

The developers of these guidelines believe that the equivalent of 400 to 1000 trap nights in suitable habitat should usually be adequate to indicate presence or absence. **As a general standard, 750 trap nights appears appropriate.** In cases of limited acreage of potential Preble's habitat, reducing trapping effort to as little as 400 trap nights (while maintaining a high trap density) may be reasonable. Rationale for reducing trapping efforts below 750 trap nights should be included in the report. To support the conclusion that Preble's is not present on large areas of apparently suitable habitat, or at or near an area of past documented occurrence, an expanded effort is required (i.e., more trap nights, multiple trapping efforts during the season, trapping over two seasons, and/or trapping in multiple locations within the suitable habitat). **Negative trapping survey results are only indicative of Preble's absence, they cannot establish whether the site is occupied at other seasons or in other years.**

A trend of reduced capture success after September 1 has been noted by researchers, especially at higher elevations within Preble's range. Therefore, from September 1 through September 15, a minimum of 6 nights of trapping and 1000 trap nights are required for presence/absence surveys.

Once presence of Preble's is documented at a site, the trapping survey can be discontinued at the surveyor's discretion. However, continuation of trapping may add knowledge of relative numbers present and use of habitats within the area surveyed.

A small (approximately 1") ball of polyester quilt or wool (fleece) will be placed in each trap as nesting/bedding material. Cotton should not be used as it absorbs moisture and loses heat readily and can contribute to thermal shock of captive animals.

In case of a large number of trap-tampering predators (i.e., raccoons, foxes, coyotes, etc.), traps will be secured to the ground with hoops of heavy-gauge malleable wire, stakes, or with other materials that can effectively secure/immobilize the traps. To minimize trap-raiding by larger mammals (e.g., skunks, raccoons) traps should not be pre-baited.

Baiting materials should include no animal products. Suitable materials include rolled oats, rolled oats and peanut butter, or livestock feed such as Manna Pro Sweet. No other baiting materials or mixtures will be used without approval from the CDOW or WGFD, and the Service.

In setting out single trap lines or a series of parallel lines, it might be assumed that most of the individual animals and species within easy travel range of the traps will be equally susceptible to being caught. This is not true since some species (and probably some individuals) will be attracted to this bait much more quickly than others. While deer mice may be drawn from a considerable distance by the smell of the bait, some other species may be only mildly attracted. Therefore, non-target species may occupy a number of traps, excluding more secretive, less numerous, or more trap-shy species, including Preble's, from these traps. Percentage of traps available (unsprung when checked) should be reported. At sites where a high proportion of traps are occupied by species other than Preble's or sprung without captures, additional trap nights (extended trapping) should be added to offset this reduced availability.

The terminal ends of each trap line should be marked with stakes, flagging, or other visible material. Unless the surveyor has had ample experience with small mammal handling, the checking of the traps should involve at least two individuals. One individual will handle the animals and the other record the data. The animals will be handled and data taken in a standard, routine order to minimize trauma to the animals and reduce the likelihood of unintended escape of captives and consequent loss of data.

Weigh any jumping mouse captured while gently holding it in a cloth handling bag or a large "Ziplock" type plastic bag. Record the weight in grams with a Pesola spring balance. Record the sex and reproductive condition. All animals will be released unharmed at the point of capture. Note in the survey report any interesting or unusual behavior during capture, handling, and upon release.

Each jumping mouse should generally be documented by at least two color photographs (digital prints or 35 mm prints, Kodachrome, ASA 100 or 200 recommended) when captured. After other information is recorded and prior to release, each individual mouse will be photographed against a piece of flat white paper as background (with date indicated legibly on the background) or in a photo box. Subjects will be lighted directly, the sun to the back of the photographer. (For presence/absence studies where identity of Preble's is not an issue, the first Preble's mouse captured at a site should be weighed and photographed. To reduce handling and related stress, subsequent animals can be released without photographing.)

Tissue sampling (ear punch, hair samples) of live captured mice may be requested by the CDOW, WGFD, or the Service for use in genetic analysis. A separate procedure will be provided under these circumstances.

In some cases (with prior consultation with the CDOW or WGFD, and the Service) jumping mouse specimens will be "taken" to be preserved as voucher specimens at the Denver Museum of Nature and Science (DMNS). No specimens will be intentionally "taken" without consultation with these agencies. (For dealing with unintentional Preble's mortalities, see below.)

Comprehensive Preble's studies (going beyond determining the presence/absence of the subspecies) require prior coordination with the CDOW or WGFD, and the Service. Prior field

experience in handling and marking small mammals is required if these studies involve permanent marking of Preble's.

Any inadvertent mortalities will be preserved for genetic study and as voucher specimens. Be cautious that Preble's that appear dead are, in fact, dead! Preble's frequently revert to dormancy when confined to traps in cool weather. Warm a dormant animal (via body heat, sunlight, etc.) until recovered, and release where captured. Careful and timely handling of dead Preble's is critical as tissues may be used in allozyme genetic studies. Place specimens in double plastic bags (to prevent freezer burn) with detailed locality information in permanent ink or soft pencil inside (specify 1/4 to 1/4 Section, Township, Range; UTM coordinates; County; Elevation; Date of Capture; Collector). Place specimens on ice or dry ice and then freeze as soon as possible. In Colorado, contact Gary Skiba, CDOW, (303-291-7466, facsimile 303/294-0874), or DMNS, (303-370-6354, facsimile 303-331-6492); in Wyoming, contact Russ Pollard, WGFD (307-473-3417), to arrange for pickup or delivery. Submit a completed Injury/Mortality Documentation Report (included in the Survey Field Data Compilation Form) to the appropriate Service Field Office. In addition, all relevant information shall be reported within 24 hours to the Colorado Field Office or the Service's Division of Law Enforcement in Lakewood, Colorado (telephone 303-274-3560).

8. TIMING OF SURVEY

Trapping results will be considered valid only if performed within the period from June 1 to September 15. Since some adult Preble's may enter hibernation by September 1 (particularly at higher elevations), trapping efforts conducted from September 1 through September 15 require increased trapping effort (see section 7).

Due to the nocturnal nature of Preble's, traps should be set in the early evening (within 3 hours of sunset) and checked as early as possible in the morning (within 3 hours of sunrise) unless unforeseen circumstances occur (to reduce stress and the potential for predation on trapped animals). If traps must remain set during warm daylight hours and the trap has no natural shade, artificial shade should be provided. Trapping should be conducted for at least three consecutive nights, unless unforeseen weather conditions dictate not trapping.

Weather is an important factor in small mammal trapping. Animals vary greatly in their behavior, activity level, and trapability, depending on factors including temperature, precipitation, high winds, humidity, and moonlight. Where seasonal weather conditions have produced a poor food crop, animals may be more attracted to bait. However, conditions such as drought, severe storms, or flooding prior to the period of trapping may reduce populations through mortality, reduced reproductive success, or emigration. A thorough description of weather conditions immediately preceding and during the trapping, and of any unusual conditions prior to the period of trapping, helps validate results of trapping and could be useful in research studies on Preble's.

9. MAPS AND AERIAL PHOTOGRAPHS

The Service recommends that, where available, Natural Resources Conservation Service soil maps (for location of wetland soils) and aerial photographs, National Wetlands Inventory maps, aerial city and county photographs, floodplain maps, and similar resources be consulted prior to site surveys to help identify potential habitat. **Surveyors should be aware that Preble's habitat is not limited to mapped streams and wetlands.**

In order to avoid duplication of effort and gain more precise information about the ecology and distribution of Preble's, a copy of the relevant portion of a U.S. Geological Survey (USGS) 7½ minute quadrangle map showing the location of the subject property or project, and any trap line transects, must be submitted with the survey report and completed Survey Field Compilation Form (regardless of whether trapping was conducted). In addition, UTM coordinates for the beginning and ending points of each transect are required to facilitate data storage and utilization. For survey sites too small to be represented adequately on a USGS 7½ minute quadrangle map, an engineering drawing, or more detailed map or sketch showing the area that has been surveyed should be included in the report.

10. ECOLOGICAL AND SITE FEATURES

In order to gain more information about the ecology, ethology, and habitat preference of Preble's, the following information must be collected and reported for each site surveyed:

A. For sites where requested disqualification from trapping is being sought, provide maps, location information, a description of the site, color photographs, and describe in detail the basis on which the site was disqualified. General site photographs (overview shots of the site) in combination with close range photographs of vegetation and other features enhance the quality of the survey report.

B. For sites requiring a trapping survey, the following information must be collected. This information can be brief and qualitative for sites where Preble's is not found.

- 1) Describe the habitat. Include ecological condition, management history, and current land use of the site as appropriate;
- 2) List the most frequent or dominant plant association of both the overstory and understory vegetation (e.g., overstory of mature cottonwood trees with an understory of orchard grass/smooth brome);
- 3) Describe the elevation, and drainage type (e.g., perennial stream, ephemeral stream, pond or lake, ditch, etc.);
- 4) Note weather conditions at the time the traps were in operation and just preceding the trapping effort; and
- 5) Note presence of other species, especially potential competitors or domestic predators.

C. In addition, for each site where Preble's is found, the following information must be collected and included in the survey report:

6) Number of individual Preble's captured or seen.

7) Map of the specific PMJM capture location(s) on a USGS 7½ minute quadrangle map of the transect (and on a finer scaled map, engineering drawing, or sketch). Capture locations shall be recorded in UTM's at least to a precision of the nearest 50 meters and to ¼ ¼ of a section, township, range (e.g., 40-acre tract).

8) Note the sex of the individual, reproductive condition (e.g., descended testes, enlarged nipples due to lactation), weight, and any distinguishing features that might be significant. Include a photograph of individuals captured and of capture sites. (For presence/absence studies where identity of Preble's is not an issue, the first Preble's mouse captured at a site should be weighed and photographed. To reduce handling and related stress, subsequent animals can be released without photographing.)

9) Note the distance to open water from the location where each Preble's was trapped.

11. SURVEY REPORTING

All survey reports (including disqualification reports) must be submitted to the appropriate Service Field Office and to the Wyoming Natural Diversity Database (for Wyoming). The Colorado Natural Heritage Program (for Colorado) only wants to receive copies of reports that include captures of jumping mice:

Colorado Natural Heritage Program, 254 General Services, Colorado State University, Fort Collins, Colorado 80523 (main (970) 491-1309, facsimile (970) 491-3349).

Wyoming Natural Diversity Database, 1604 Grand Avenue, Laramie, Wyoming 82070 (main (307) 745-5026, facsimile (307) 745-1506).

Please include the following information with survey reports:

- 1) Full name and address of surveyor(s).
- 2) Site location: address and legal description specified to ¼ ¼ Section, Township, Range, County; drainage name; UTM coordinates; and elevation.
- 3) State whether any project is currently planned for the site, as well as project name (if applicable). Include a brief project description indicating the proposed impact to site.
- 4) Provide a detailed basis for the requested disqualification (if applicable).
- 5) Maps (at minimum a reproduced portion of a USGS 7½ minute quad).
- 6) Color photographs of habitat present.
- 7) Appendices.

For sites where a trapping survey was conducted include, in addition to relevant portions above, the following:

- 8) Dates and times when surveys were conducted.
- 9) Type of bait used.
- 10) Weather conditions before and during survey.
- 11) Ecological and site features.
- 12) Trap nights.
- 13) Dominant plant association of overstory and understory vegetation.
- 14) Ecological condition/management history.
- 15) Elevation and relation to drainage system (e.g., associated wet meadow, streambank, irrigation ditch, seep, etc.).

If Preble's is documented during a trapping survey include:

- 16) Characteristics of the individuals.
- 17) Color photographs of Preble's and its habitats.
- 18) UTM coordinates of capture(s).

If Preble's is present and the survey is part of a comprehensive study include:

- 19) Type (e.g., fur-dying, pit-tagging, radio-collaring) and exact location of markings.
- 20) Population count or estimate including method used (only if feasible).

12. NOTIFICATION

The U.S. Fish and Wildlife Service, Colorado Natural Heritage Program, Wyoming Natural Diversity Database, CDOW, and WDGf (as appropriate) shall be notified immediately if a new population of Preble's is discovered.

Peter Plage
U.S. Fish and Wildlife Service
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215
main (303) 275-2370
facsimile (303) 275-2371

Mary Jennings
U.S. Fish and Wildlife Service
Wyoming Field Office
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Rob Schorr
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Gary Skiba
Colorado Division of Wildlife
6060 Broadway
Denver, Colorado 80216
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facsimile (303) 294-0874

13. SERVICE APPROVAL

Completed Survey Field Data Compilation Forms with habitat assessment reports, trapping surveys, or disqualification requests must be submitted to the appropriate Service Field Office listed above **within 30 days from completion of the reports**. The Service will review submitted reports and generally reply with a written letter responding to the report within 30 days of receipt of the report. If a trapping survey is judged insufficient, the Service will make every effort to notify the author promptly so that a satisfactory trapping survey may be completed during the allowed survey time. However, given the narrow trapping survey time window, it may not be possible to rectify an inadequate survey effort during the same field season. **Surveys and Service clearance will be considered valid for 1 year** from the date of the Service response letter. If habitat alteration has not begun within 1 year, the appropriate Service Field Office can be contacted regarding a request for clearance extension or the potential need for an updated survey.

14. SERVICE FOLLOW-UP

Survey reports and maps will be retained by the Service and are available for review at the appropriate (CO or WY) offices during regular business hours. Reported information will be summarized and used to improve our understanding of Preble's range and distribution and help predict potential habitat. Submitted habitat assessments and trapping surveys will be correlated and updated annually and available for public review on the NDIS website for Preble's at <http://ndis.nrel.colostate.edu>. A link to the NDIS can be found at the Service's Preble's website at <http://www.r6.fws.gov/preble>.

15. LITERATURE CITED

Armstrong, D.M., M.E. Bakeman, A. Deans, C.A. Meaney, and T.R. Ryan. 1997. Report on habitat findings of the Preble's meadow jumping mouse. Boulder (CO): Report to the U.S. Fish and Wildlife Service and Colorado Division of Wildlife. 91 pp.

Dharman, A.T. 2001. Movement patterns of Preble's meadow jumping mouse. Master Thesis. Colorado State University. 52 pp.

Ensign Technical Services. 1997. Presence or absence survey for Preble's meadow jumping mouse at St. Vrain Creek, Boulder County, Colorado (Reports 1-7). Boulder (CO): Under contract with Sugnet and Associates for Colorado Department of Transportation.

Meaney, C.A., A. Deans, N.W. Clippenger, M. Rider, N. Daly, and M. O'shea-Stone. 1997. Third year survey for Preble's meadow jumping mouse (*Zapus hudsonius preblei*) in Colorado. Boulder (CO): Under contract to Colorado Division of Wildlife. 57 pp.

Ryon, T.R. 1999. 1999 Study of the Preble's meadow jumping mouse at the Rocky Flats Environmental Technology Site. Report to the U.S. Fish and Wildlife Service. 23 pp.

Schorr, R.A. 2001. Meadow jumping mice (*Zapus hudsonius preblei*) on the U.S. Air Force Academy, El Paso County, Colorado. Colorado Natural Heritage Program, Unpublished report to the Natural Resources Branch, U.S. Air Force Academy. 55pp.

Shenk, T.M. 1998. Conservation assessment and preliminary conservation strategy for Preble's meadow jumping mouse (*Zapus hudsonius preblei*). Fort Collins (CO): Colorado Division of Wildlife. 38 pp.

Shenk, T.M. and J.T. Eussen. 1998. Habitat use and distribution of Preble's meadow jumping mouse (*Zapus hudsonius preblei*) in Larimer and Weld Counties, Colorado. Fort Collins (CO): Colorado Division of Wildlife. 26 pp.

Shenk, T.M. and M.M. Sivert. 1999a. Movement patterns of the Preble's meadow jumping mouse (*Zapus hudsonius preblei*) as they vary across time and space. Fort Collins (CO): Colorado Division of Wildlife. 35pp.

Shenk, T.M. and M.M. Sivert. 1999b. Temporal and Spatial Variation in the Demography of Preble's meadow jumping mouse (*Zapus hudsonius preblei*). Fort Collins (CO): Colorado Division of Wildlife January-March 1999 Quarterly Report. 16 pp.

Shenk, T. 2000. Temporal and spacial variation in the demography and movement patterns of Preble's meadow jumping mouse (*Zapus hudsonius preblei*). Fort Collins (CO): Colorado Division of Wildlife. 41 pp.

Preble's Meadow Jumping Mouse, *Zapus hudsonius preblei*

2004 Survey Field Data Compilation Form

TRAPPING SURVEY EVALUATED, NOT TRAPPED

Fill out both sections 1 and 2 if trapping survey, fill out section 1 only if habitat evaluation (ie. not trapped). Compilation forms needed for updated habitat evaluations and site disqualification requests.

SECTION 1

Surveyor:

Date of Site/Habitat Assessment _____

Organization/Company _____

Full Name(s) _____

Location:

Project Name (if applicable) _____

Project Description (nearby road intersection, type of impact, etc.) _____

U.S.G.S. Quad Name _____ County _____ Elevation _____

Township(s) _____ Range(s) _____ Section(s) _____

1/4 Section(s) _____

UTM Coordinates, Zone 13 Northing _____ Easting _____

UTM Coordinate Datum NAD27 NAD83

Directions to Location _____

Land Ownership _____

Habitat:

General Habitat Description _____

Dominant Overstory Plant Community _____

Dominant Understory Plant Community _____

Current Land Use _____

Drainage Name: _____ Type: Perennial Stream _____

Ephemeral Stream _____ Pond/Lake _____ Ditch _____ Other _____

SECTION 2:

Z. h. preblei found ? Yes No Dates of Survey _____

Trapping Information:

Type of Traps _____ Type of Bait _____

% Available (unsprung) _____ Number of Nights Trapped _____

Total Trapnights _____

Weather conditions prior to and during survey _____

Associated Animal Species (especially urban predators, rats, house mice) _____

Sketch of surveyed area showing traplines, specific area disqualified (can be done on required U.S.G.S. map of site if appropriate).

Preble's Data:

Number of Preble's trapped or seen _____

Distance from water (m) Sex (m/f) Evidence of repro.* Weight (grams). Marked or tagged?

1.

2.

3.

4.

(Continue on separate sheet if needed)

* Reproduction evidence for males is descended testes, for females is enlarged nipples.

Evidence of disease, predation or injury _____

(Submit injury/mortality form if appropriate)

Genetic Material Obtained? Yes _____ No _____ Forwarded to _____

Specimen(s)? Yes _____ No _____ Forwarded to _____

Additional Comments:

(SUBMIT THIS FORM WITH THE SURVEY REPORT WHEN APPROPRIATE)
***Zapus hudsonius preblei* Injury/Mortality Documentation**

- _____ **Found dead**
- _____ **Found severely injured, euthanized**
- _____ **Slightly injured, returned to wild**
- _____ **Died during handling**

Date/Time: _____

Location: _____

Weather Conditions: _____

Approximate Time Trap Set: _____

Time Trap Checked: _____

Field Technician(s) Present: _____

Information:

PIT TAG Number: _____

Weight (g): _____

Total Body Length (mm): _____

Tail Length (mm): _____

Hindfoot Length (mm): _____

Ear Length (mm): _____

Sex: _____

Reproductive Condition(s): _____

Description of Injury: _____

Details of Probable Reasons for Injury or Mortality: _____

Signature of Technician(s):