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FISH AND WILDLIFE SERVICE

Mountain-Prairie Region

ES/GJ-6-CO-00-F-009
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April 12, 2000

Colonel Susanne M. Waylett
Commander
8120 Edgerton Drive, Suite 40
USAF Academy, Colorado 80840-2400

Dear Colonel Waylett:

In accordance with section 7 of the Endangered Species Act as amended (16 U.S.C. 1531 et seq.) and the Interagency Cooperative Regulations (50 CFR 402), this transmits the U.S. Fish and Wildlife Service's final biological opinion on the effects of proposed actions on federally-listed endangered and threatened species as described in the Preble's Meadow Jumping Mouse Conservation Agreement, U.S. Air Force Academy (Conservation Agreement) and Conservation and Management Plan for Preble's Meadow Jumping Mouse on the U.S. Air Force Academy, 2000 (Conservation Plan).

Your request for formal consultation was agreed to at a meeting which occurred on December 14, 1999, at the offices of the Service and was based on presentation of the "Conservation and Management Plan for Preble's Meadow Jumping Mouse, U.S. Air Force Academy, 1999," and the "U.S. Air Force Academy Preble's Meadow Jumping Mouse Conservation Agreement, U.S. Air Force Academy, 2000." The Conservation Agreement and Conservation Plan outline the specific objectives and strategies required to secure long-term conservation of Preble's within the U.S. Air Force Academy's lands and on lands adjacent to the Academy, and provides guidance for Academy management decisions over the next five years (2000-2004).

At issue are the effects of the proposed actions on the threatened Preble's meadow jumping mouse (*Zapus hudsonius preblei*). No other federally-listed species are known to occur on Academy lands, therefore none will be affected by the proposed activities. If the various project descriptions change, or previously unknown listed species are found to be present and adversely affected, the effect determinations would change and require reinitiation of formal consultation.

This biological opinion is based on information provided in the following documents: the Conservation Agreement; the Conservation Plan, the Integrated Natural Resources Management Plan, Farish Memorial, 1996 (Farish Integrated Natural Resources Management Plan); the Integrated Natural Resources Management Plan, U.S. Air Force Academy, 1997 (Academy

Integrated Natural Resources Management Plan); and informal consultation between our staffs.

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All above-mentioned documents are incorporated herein by reference. A complete administrative record of this consultation is on file at the Service's Field Office.

Consultation History

On May 13, 1998, Preble's was listed as threatened under the Act. Full protection for Preble's became effective on June 12, 1998.

Anticipating the listing of Preble's, the Academy included Preble's and other native species issues into the Academy Integrated Natural Resources Management Plan. Based upon a meeting between the Service and Academy on February 11, 1999, it was concluded to "commit to pursue a formal mechanism (such as a cooperative agreement) that would enable both agencies to accomplish common conservation goals in a timely and cooperative manner under the Act."

In response to the February 1999 meeting, a Conservation Plan was completed by October 1999, and a draft Conservation Agreement was available by November 14, 1999. Based upon completion of the Conservation Plan and Conservation Agreement, the Academy and Service held a meeting to review these documents on December 14, 1999. Following the December 14, 1999, meeting, Colonel Waylett of the Academy wrote to the Service requesting signature of the Conservation Agreement and issuance of a formal biological opinion under section 7 of the Act on the Conservation Plan.

The consultation process, in addition to the need to review and update the baseline, allows the Academy and the Service to examine regional trends and issues. Programmatic consultations on limited time frames facilitate the identification of problems and issues before they become severe and while proactive remedies still exist. Such early and continual cooperative efforts between action agencies and regulatory agencies represent a critical component in the adaptive management process.

Background on Programmatic Consultations

This programmatic consultation and the adoption of both the Conservation Plan and the

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Conservation Agreement will contribute to the conservation and recovery of Preble's by enhancing habitat conditions and reducing fragmentation. Since the Act requires the Academy to ensure that its actions do not jeopardize listed species, this consultation will analyze the Academy's maintenance and repair activities, as well as research activities regarding reproduction, numbers, and distribution of the Preble's, and enhancement/restoration activities planned for Academy lands over a 5-year period.

BIOLOGICAL OPINION

This biological opinion is based on information regarding cumulative effects, conditions forming the environmental baseline, the status of the Preble's, and the importance of the project area to the survival and recovery of the species. The data used in this biological opinion constitute the best scientific and commercial information currently available.

It is the Service's biological opinion that neither the direct nor indirect effects of the proposed projects (which includes the implementation of conservation measures agreed to during informal consultation and outlined in this biological opinion) will jeopardize the continued existence of Preble's. Although the proposed projects may adversely affect Preble's and its habitat within lands owned by the Academy, the proposed actions and conservation measures will avoid the likelihood of jeopardy to the species. No critical habitat has been designated for this species, therefore, none will be affected.

DESCRIPTION OF THE PROPOSED ACTION

The action area is located on the Academy in northern El Paso County, Colorado. The proposed action is the implementation of the Conservation Agreement and Conservation Plan. The goal of the Conservation Agreement is to ensure the long-term survival and conservation of Preble's and its habitats on Academy lands through: 1) implementation of the Conservation Plan, 2) minimization of impacts to Preble's and its habitat during Academy maintenance and repair activities, and 3) continuation of implementation of the Academy Integrated Natural Resources Management Plan and Farish Integrated Natural Resources Management Plan.

The goals identified in the Conservation Plan include: (a) maintain and enhance Academy populations of the Preble's, and associated native plant and animal species, as directed in the

Academy Integrated Natural Resources Management Plan; (b) protect the integrity of the Academy portion of the main stem of Monument Creek; and (c) protect Academy portions of tributaries to Monument Creek that are currently occupied by Preble's and contain Preble's habitat that is connected to habitat along Monument Creek.

The Conservation Agreement acts to implement the Conservation Plan and continue the implementation of the Academy Integrated Natural Resources Management Plan and the Farish Integrated Natural Resources Management Plan. The Conservation Agreement also allows for completion of fiscal years 2000-2004 maintenance and repair activities, research activities, and enhancement/restoration activities on lands owned by the Academy. In reviewing the Conservation Plan and Conservation Agreement, the Service has determined that the following activities may result in adverse effects to Preble's. Therefore, these proposed activities are evaluated in this biological opinion and the effects of incidental take are analyzed. Specifically, these actions are described below.

1. Completion of up to 12.0 acres of repair and maintenance to existing facilities within Preble's habitat each year as defined in Table 1 of Appendix A. Total impacts of repair and maintenance activities will not exceed 60.0 acres within any 5-year period. The allocated amount of take should account for the additional effects of emergency repairs (not included in this biological opinion) in any given year. Also, all measures taken to reduce the impacts of take for defined repair and maintenance activities (that meet success criteria) and all restoration or enhancement projects that result in augmentation of amount of Preble's habitat must exceed the total impacts (i.e. 60.0 acres plus all emergency repair impacts) over the 5-year period.
2. Completion of research activities as defined in Table 2 of Appendix A. Research activities within Preble's habitat include 5 acres of prescribed burning annually over the 5-year period (not to exceed 25 acres over the 5-year period) and excavation of 2 hibernacula over 2 years (not to exceed 4 hibernacula over the 5-year period).
3. Completion of enhancement and restoration activities within Preble's habitat as defined in Table 3 of Appendix A. This includes two projects with total impacts of 0.5 acre over the 5-year period.

Conservation Measures

Actions in the project description that the Academy will implement to further the recovery of

threatened and endangered species are known as conservation measures. As part of the proposed action, the beneficial effects of these conservation measures are taken into consideration in the jeopardy and incidental take analyses. Conservation measures are part of the proposed action and their implementation is required under the terms of this consultation. Specific conservation measures identified in the Conservation Plan and Conservation Agreement and included in this biological opinion that will benefit threatened and endangered species include the following.

1. Maximize the extent, quality, and connectivity of Preble's habitat within the Academy.
2. Conduct research and monitoring projects to increase understanding of Preble's life history and habitat requirements.
3. Eliminate or minimize threats to Preble's and its habitats within Academy boundaries.
4. Actively participate in the El Paso County planning effort to encourage maximum protection of Preble's populations and associated habitats on adjacent lands, and to ensure long-term viability of the Academy population.

Programmatic Sideboards

All projects carried out under this biological opinion must be consistent with the Conservation Agreement, Conservation Plan, and the Mitigation Plan and Success Criteria to be developed by May 15, 2001, as defined in the Conservation Agreement.

STATUS OF THE PREBLE'S MEADOW JUMPING MOUSE

Preble's is a small rodent in the family Zapodidae and is 1 of 12 recognized subspecies of the species *Z. hudsonius*, the meadow jumping mouse. Preble's is native only to the Rocky Mountains-Great Plains interface of eastern Colorado and southeastern Wyoming. This shy, largely nocturnal mouse lives in moist lowlands with dense vegetation. It is 8 to 9 inches long (its tail accounts for 60 percent of its length) with hind feet adapted for jumping. Preble's hibernates underground from September to May.

Historic records for Preble's define a range including Adams, Arapahoe, Boulder, Denver, Douglas, El Paso, Elbert, Jefferson, Larimer, and Weld counties in Colorado; and Albany,

Laramie, Platte, Goshen, and Converse counties in Wyoming (Krutzsch 1954, Compton and Hugie 1993). Armstrong et al. (1997, p. 77) described typical Preble's 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."

Preble's has undergone a decline from its historic range and populations within its remaining range have been lost. Habitat loss and fragmentation resulting from human land uses have adversely impacted Preble's populations. David Armstrong (University of Colorado, pers. com. 1998) concluded that the meadow jumping mouse, in this region as elsewhere, is a habitat specialist, and that its specialized habitat is declining.

Compton and Hugie (1993, 1994) cited human activities that have adversely impacted Preble's including: conversion of grasslands to farms; livestock grazing; water development and management practices; and residential and commercial development. Shenk (1998) linked potential threats to ecological requirements of Preble's and suggested that factors which impacted vegetation composition and structure, riparian hydrology, habitat structure, distribution, geomorphology, and animal community composition must be addressed in any conservation strategy.

Residential and commercial development, accompanied by highway and bridge construction, and instream alterations to implement flood control, directly remove Preble's habitat, or reduce, alter,

fragment, and isolate habitat to the point where the Preble's can no longer persist. Corn et al. (1995) proposed that a 100 meter (328 foot) area of unaltered habitat be established to protect the flood plain of Monument Creek from a range of human activities that might adversely affect Preble's or its habitat. Roads, trails, or other linear development through Preble's habitat may act as barriers to movement. 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.

Further information about the biology and status of the Preble's can be found in the "Conservation Assessment and Preliminary Conservation Strategy for Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*)" (Shenk, 1998, available upon request).

ENVIRONMENTAL BASELINE

On the Academy, Preble's have been captured on Monument Creek, Smith Creek, Monument Branch, West Monument Creek, Black Squirrel Creek, Deadmans Creek, Upper Lehman Run, Lower Lehman Run, Pine Creek, Kettle Creek, Goat Camp Creek, and an unnamed creek that runs through Douglass Valley. Many of these creeks also flow onto properties outside of the Academy. Other areas of El Paso County that are known to support Preble's include Beaver Creek, Dirty Woman Creek, Jackson Creek, and Cottonwood Creek.

EFFECTS OF ACTION

The proposed actions will affect a maximum of 85.51 acres of potential Preble's habitat as defined in Appendix A. Specifically, this includes a maximum of 12 acres annually for maintenance and repair activities, 5 acres annually for prescribed burning, the excavation of 4 hibernation burrows (approximately 0.01 acre) within the 5-year period for research purposes, and 0.5 acre for enhancement/restoration activities.

The riparian corridors located within Academy lands are expected to be inhabited by Preble's year-round. Therefore, there is a possibility that the proposed actions could directly impact Preble's through direct killing and alteration of habitat likely to be used by Preble's. The areas to be impacted represent a small portion of the potential Preble's habitat present on Academy lands. The projects are not expected to significantly impact the ability of Preble's to travel upstream or downstream along suitable riparian areas.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed actions are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The project area is located on the Academy in northern El Paso County, Colorado. Any additional adverse effects not included in this biological opinion will require reinitiation of this opinion or separate section 7 consultations. Current land use outside of Academy lands is becoming focused upon residential and commercial development, rather than historic agricultural uses, and is expected to continue at a substantial rate. Therefore, the Service expects a variety of additional direct and secondary adverse impacts to continue to occur due to future development

outside of Academy lands which could affect the viability of Preble's populations on the Academy.

CONCLUSION

After reviewing the current status of Preble's, the environmental baseline for the action area, the effects of the proposed actions and the cumulative effects, it is the Service's biological opinion that these actions, as proposed, are not likely to jeopardize the continued existence of Preble's. No critical habitat has been designated for this species, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Academy, as appropriate, for the exemption in section 7(o)(2) to apply. The Academy has the continuing duty to regulate the activities covered by this Incidental Take Statement. If the Academy fails (1) to assume and implement the terms and conditions or (2) to require any hired personnel or contractors to adhere to the terms and conditions of the Incidental Take Statement through enforceable terms that are added to any permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, Academy must report the progress of the proposed actions or their impacts on the species to the Service as specified in the Incidental Take Statement.

AMOUNT OR EXTENT OF TAKE

The Service anticipates that it will be difficult to quantify or detect incidental take of Preble's due to direct mortality because of their small size and secretive nature. However, the following level of take can be anticipated by loss of food, cover, and other essential habitat elements. The Service anticipates that the proposed actions will result in incidental take of an undetermined number of Preble's associated with a maximum of 85.51 acres of potential Preble's habitat over 5 years, as defined in Appendix A. Specifically, this includes a maximum of 12.0 acres annually due to maintenance and repair activities, 5.0 acres annually for prescribed burning (the majority of which would be in upland forage areas), the excavation of 4 hibernacula within the 5-year period for research purposes (approximately 0.01 acre), and 0.5 acre for enhancement/restoration activities.

REASONABLE AND PRUDENT MEASURES

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of Preble's.

1. The Academy will work with the Service to develop the Mitigation Plan and Success Criteria by May 15, 2001, as defined in the Conservation Agreement.
2. The Academy will monitor the extent of habitat impacted to ensure that it does not exceed the authorized area.
3. Any accidental impacts to areas outside of the authorized area will be restored and mitigated in coordination with the Service.
4. The Academy will monitor all aspects of any proposed restoration, enhancement, and mitigation actions to ensure project completion and success.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the Academy must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring. These terms and conditions are non-discretionary.

1. Workers onsite will be trained by an Academy biologist as to the reason for, and importance of, limiting impacts to vegetated habitat outside the fenced work area.
2. Work will be supervised at all times by an onsite individual from Academy or by an authorized representative familiar with Preble's and its habitat needs.
3. The area of proposed impacts for any maintenance or repair actions will be fenced with snow fence or a similar visible barrier to prevent inadvertent impacts to habitat outside the construction footprint.
4. In the unlikely event that a Preble's (dead, injured, or hibernating) is located during any proposed activities, the Service's Colorado Ecological Services Field Office of the Service (303) 275-2370 or the Service's Law Enforcement Office (303) 274-3560 will be contacted immediately.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed actions. If, during the course of the action, this level of incidental take (loss of 85.51 acres of potential Preble's habitat) is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Academy must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that may be used to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The Service believes that the Conservation Agreement and Conservation Plan will contribute to the conservation of the Preble's on Academy lands.

REINITIATION NOTICE

This concludes formal consultation on the fiscal years 2000-2004 programs for maintenance and repair activities, research activities, and enhancement/restoration activities on lands owned by the U.S. Air Force Academy, El Paso County, Colorado. As required by 50 CFR 402.16, reinitiation of formal consultation is required if; (1) the amount or extent of incidental take is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the agency action is subsequently modified in a manner that causes an adverse effect to the listed species or critical

habitat that was not considered in this opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where incidental take exceeds the amount authorized, any operations causing such take must cease pending reinitiation.

If you have any questions or would like to discuss this in more detail, please contact Kathleen Linder from our Lakewood Ecological Services Field Office

Sincerely,

/s/ Terry Terrell

Deputy Regional Director

REFERENCES

- Armstrong, D.M., M.E. Bakeman, A. Deans, C.A. Meaney, and T.R. Ryon. 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.
- Colorado Natural Heritage Program. 1999. Conservation and Management Plan for the Preble's meadow jumping mouse on the U.S. Air Force Academy. Produced under contract with the U.S. Air Force Academy.
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- Corn, J.G., C.A. Pague, A.R. Ellingson, M. Sherman, T. Zwiyczaj, G. Kittel, and C. Fleming. 1995. Final report on the geographic extent of the Preble's meadow jumping mouse population on the United States Air Force Academy. Ft. Collins (CO): Colorado Natural Heritage Program; under contract with the United States Air Force Academy. 40 pp.
- Krutzsch, P.H. 1954. North American jumping mice (genus *Zapus*). University of Kansas Publications, Museum of Natural History 7:349-472.
- Shenk, T. 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.
- U.S. Air Force Academy. 1996. Master Plan, Integrated Natural Resources Management Plan and Environmental Assessment, Farish Recreation Area, U.S. Air Force Academy. Department of Defense Legacy Resource Management Program. NPS D-254B. 102 pp.
- U.S. Air Force Academy. 1997. Integrated Natural Resources Management Plan and Environmental Assessment for the U.S. Air Force Academy. Department of Defense Legacy Resource Management Program. NPS D-315A. 95 pp.
- U.S. Air Force Academy. 2000. Preble's meadow jumping mouse Conservation Agreement with

the U.S. Fish and Wildlife Service. Prepared by Bruce D. Rosenlund, Project Leader, U.S. Fish and Wildlife Service, Colorado Fish and Wildlife Assistance Office. Copy available at the Academy, Natural Resources Office. 11 pp.

APPENDIX A

Table 1. Acres of Identified and Unidentified Repair and Maintenance Projects within Preble's Habitats (300 Feet of the 100-year flood plain), U.S. Air Force Academy, Colorado, FY00-FY04.

FY	Project #	Description	Project Acres	Preble's Habitat Acres*
00	00-0021	Repair Cathodic Protection	6.1	0.7
00	00-0024	Repair Kettle Lake Dam #1	1.3	0.5
00	00-1008	Repair Storm Drains, Academy Drive	3.0	0.5
00	00-2000	Utilities Requirements	1.2	0.2
00	91-0011B	Repair Jogging Path, Prep School	7.3	0.5
00	99-0023HH	Repair Storm Drainage, Golf Course	6.0	<u>4.0</u>
00		Total Identified Projects		6.4 Acres
00		Total Unidentified Projects		5.6 Acres
00		Total		12.0 Acres
01	01-0011	Repair Drop Structures, Cross and Int.	1.0	0.2
01	01-2000	Utilities Requirements	4.0	2.0
01	01-2007	Rpr/Rpl Sewer Line, Golf Course West	5.5	2.0
01	98-20022	Rpl HTHW Line to Hospital	6.1	3.0
01	01-2011	Rpl Pot Water Valves, Ph 3/4	2.0	<u>0.5</u>
01		Total Identified Projects		7.7 Acres
01		Total Unidentified Projects		2.3 Acres
01		Total		12.0 Acres
02	01-2001	Rpr/Rpl Main Sewer Line, Pine Valley	9.1	6.0
02	01-2002	Erosion Control-Lehman Run	3.0	2.0
02	01-2008	Rpr/Rpl Main Sewer Ln, Cmty Cir	8.0	0.5
02	02-2000	Utilities Requirements	4.0	1.0
02	97-0004	Repair Womans Softball Complex	3.0	<u>1.0</u>
02		Total Identified Projects		11.0 Acres
02		Total Unidentified Projects		1.0 Acres
02		Total		12.0 Acres
03	03-2001	Repair/Replace Sanitary Sewer	10.0	2.0
03	02-2002	Rpr/Rpl Main Sewer Line, Airfield	18.0	2.0
03	03-2000	Utilities Requirements	5.0	2.0

03	03-2008	Repair Sanitary Sewer,167 to F5	9.1	2.0
03	03-2009	Repair Sanitary Sewer	0.5	0.5
03	93-0085c	Repair Jogging Path, Cadet Area	4.0	<u>2.0</u>
03		<i>Total Identified Projects</i>		<i>11.0 Acres</i>
03		<i>Total Unidentified Projects</i>		<i>1.0 Acres</i>
03		<i>Total</i>		<i>12.0 Acres</i>

Table 1. Cont.

04	04-2000	Utilities Requirements	12.0	2.0
04	04-2002	Repair Sanitary Sewer, Cadet Area S.	6.0	<u>1.0</u>
04		<i>Total Identified Projects</i>		<i>3.0 Acres</i>
04		<i>Total Unidentified Projects</i>		<i>9.0 Acres</i>
04		<i>Total</i>		<i>12.0 Acres</i>

* Total of Yearly Project Acres for Maintenance and Repair Activities will not exceed 12.0 acres.

Table 2. Acres of Research Projects within Preble's Habitats (300 Feet of the 100-year flood plain), U.S. Air Force Academy, Colorado, FY00-FY04.

2.1: Note: All trapping will be implemented by the Colorado Natural Heritage Program under the provisions of their trapping permit, appropriate provisions for incidental take under that permit authorization are NOT included in this programmatic biological opinion.

2.2.1: The research proposal is to document spatial and micro-habitat characteristics of 10 hibernacula, and [destructively] analyze 2 hibernacula, in 2 consecutive years (i.e. not to exceed a total of 4 hibernacula over the 5-year period). It is hoped that this information in conjunction with other similar research in the region would be sufficient. If the need for further hibernacula research becomes evident in the course of this proposed study, consultation with the Service would be initiated. In addition if hibernacula contain multiple mice, the Service will be consulted before proceeding. Actual physical disturbance for excavating a hibernacula would probably not exceed 1 meter square, however probability of a "take" would be high/[almost] certain. Note: Excavation of hibernacula is difficult because they hibernate near well-established vegetation (often involving excavation of a willow patch with a base 1 meter in diameter).

2.2.6: Prescribed fire research. The prescribed fire research would be designed so that no more than 5 acres within Preble's habitat would be burned in any given year, and no more than 1 acre would be contiguous (i.e. not to exceed 25 acres of potential Preble's habitat over the 5-year period). Impacts are upland, primarily in the grassy meanders, and involve temporary removal of vegetation. No direct impacts are expected from wildlife that is mobile (i.e. the mouse will readily move out of the way of low intensity fire). The intent of the research is to re-introduce fire as an ecological dynamic into the riparian association, and could be accomplished within the guidelines set forth in the Guidance on Ditch Maintenance dated 01 Feb 2000, Service, Section 3.b. Specifically: (1) burning to take place in the Spring prior to emergence of the mouse in May, and (2) burning to take place (primarily) in the non-shrub vegetation (upland grasses). Therefore, no take is anticipated with this action.

Table 3. Acres of Enhancement and Restoration Projects within Preble's Meadow Jumping Mouse Habitats (300 Feet of the 100-year flood plain), U.S. Air Force Academy, Colorado, FY00-FY04.

1.2.7: Physically creating the "diversion" to re-route the flows into the original channel will involve direct (temporary construction related) impacts to approximately 0.2 acre. The original

meander will add almost 0.25 miles of habitat to the stream reach (current alignment is a straight irrigation ditch from the ranch days).

1.3.1: Construction of 2 earthen erosion control dams and some (limited) bank stabilization work will (temporarily) impact approximately 0.3 acres.