

Endangered Species Act Impacts on Office of Legacy Management Activities at the Rocky Flats, Colorado, Site – 15268

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ABSTRACT

The Endangered Species Act was passed by Congress in 1973 to protect and recover imperiled species and the ecosystems they rely on. The Preble's meadow jumping mouse (Preble's mouse, *Zapus hudsonius preblei*) was discovered living along the streams at the Rocky Flats Site on the Front Range of Colorado, in the early 1990s during baseline ecological monitoring. In 1998, the Preble's mouse was classified as a federally listed threatened species under the Endangered Species Act. As a result, the mouse and its habitat are protected and Section 7 consultation with the US Fish and Wildlife Service (US FWS) is required before activities may be conducted in Preble's mouse habitat. This requirement has the potential to impact Rocky Flats project schedules and costs since approval from US FWS is needed prior to conducting activities.

To reduce the need to consult with US FWS for projects on a case-by-case basis, a programmatic approach was taken. A master list of ongoing activities and other potential future activities was developed and evaluated in a Programmatic Biological Assessment (PBA) that was written for site activities. The PBA that was approved in 2004 worked well during closure, but did not address many ongoing, postclosure US DOE Office of Legacy Management activities. As a result, the PBA was rewritten in 2013 to address postclosure routine and project-specific activities. The use of a programmatic approach has reduced the time and costs associated with getting individual US FWS approvals, which has in turn minimized impacts to schedules. The programmatic approach could prove useful for other US DOE sites with federally listed species.

INTRODUCTION

US DOE's Rocky Flats Site is located between Boulder, Colorado, and Golden, Colorado, along the Front Range of the Rocky Mountains. The site is approximately 26 kilometers (16 miles) northwest of downtown Denver. The site was established in 1951 to manufacture nuclear weapons components for the nation's nuclear weapons program. During the height of operations, over 6,000 employees worked at the site. Weapons production halted in 1992 and the site's mission changed to include environmental investigations, cleanup, and site closure in 1994. In October 2005, US DOE and its contractor completed an accelerated 10-year, \$7 billion cleanup of chemical and radiological contamination left from nearly 50 years of production. The cleanup required the decommissioning, decontamination, demolition, and removal of more than 800 structures; removal of more than 500,000 cubic meters (650,000 cubic yards) of low-level radioactive waste; and remediation of more than 360 potentially contaminated environmental sites. As a result of cleanup operations, approximately 265 hectares (656 acres) of disturbed land required revegetation.

Prior to site closure, US DOE managed approximately 2,505 hectares (6,191 acres) at the Rocky Flats Site. Of this, approximately 162 hectares (400 acres) was developed as the industrial complex. The remainder was a Buffer Zone between the industrial area and offsite areas. Little work or disturbance took place in the Buffer Zone and most of it remained as undisturbed native natural areas. Today, US DOE Office of Legacy Management (LM) manages approximately 529 hectares (1,308 acres) in the Central Operable Unit and approximately 77 hectares (191 acres) in the Peripheral Operable Unit. Approximately 1,900 hectares (4,695 acres) were transferred to the Rocky Flats National Wildlife Refuge after site closure. Refuge areas are managed by the US Fish and Wildlife Service (US FWS).

DISCUSSION

Background

In 1991, during baseline ecological monitoring at the Rocky Flats Site, small-mammal trapping documented the presence of the Preble's meadow jumping mouse (Preble's mouse, *Zapus hudsonius preblei*) (Fig. 1) along the streams at the site. Prior to that, the species had not been recorded in the vicinity for several decades.



Fig. 1. Preble's mouse captured at the Rocky Flats Site. Note the large hind feet, the long tail, and the dark-colored stripe on its back.

At the time, the Preble's mouse was a candidate species under the Endangered Species Act (ESA), but had no statutory protection under the ESA. US FWS, however, encourages early conservation efforts for candidate species because those efforts can maximize management options, reduce costs, and lower the potential for more restrictive land-use policies if the species does get listed

under the ESA. US DOE therefore supported continued trapping and study of the Preble's mouse at the Rocky Flats Site through 2003. Rocky Flats ecologists began a study of the mouse to determine its onsite distribution and to characterize its habitat. Several years of live trapping, radio collaring and telemetry, and habitat characterization were conducted to determine the locations that the Preble's mouse inhabited at the site and thus identify what habitat was most important to conserve. The information was used to develop the *Preble's Meadow Jumping Mouse Protection Plan*, U.S. Department of Energy, Rocky Flats Field Office document, which included a map of the protected Preble's mouse habitat at the Rocky Flats Site. The research conducted at the Rocky Flats Site and at other locations where Preble's mice were eventually found ultimately helped provide the basis for listing the species as threatened under the ESA in May 1998 (63 FR 26517) [1]. As a result of the research conducted at the Rocky Flats Site, and the development of a Preble's mouse habitat map specific to the habitat requirements for the Preble's mouse at the site, the potential for impacts to the mouse as site closure activities were being planned was reduced.

The ESA was passed by Congress in 1973 to protect and recover imperiled species and the ecosystems they rely on. The listing of the Preble's mouse as a federally protected threatened species under the ESA in 1998 provided it with statutory protection. This meant that no activities that would take place in the habitat of the Preble's mouse could proceed without a prior consultation with US FWS. As cleanup and closure activities were beginning to increase at the Rocky Flats Site, this created a series of issues. Project managers didn't want to hear about a mouse that was going to cause problems with project schedules, potentially increase project costs, or somehow delay closure of the site. As a federal agency, however, US DOE was required to conduct Section 7 consultations with US FWS because US DOE was authorizing, funding, and carrying out activities with the potential to affect a listed endangered or threatened species. As a result, all of the agencies involved with the cleanup and closure efforts at the Rocky Flats site—specifically US DOE, US FWS, US EPA, the Colorado Department of Public Health and Environment, and the Colorado Department of Natural Resources—signed a Memorandum of Agreement to ensure that activities at the site were in compliance with the ESA.

Section 7 Consultation Process

Section 7 consultations typically begin as an informal discussion with US FWS about a project and its potential impacts to a listed species. If the federal agency (e.g., US DOE) concludes that the proposed action or activity is not likely to affect any listed species in the project area, and if US FWS agrees, the informal consultation process is concluded and the project can proceed. If, however, the determination is made that the proposed action is likely to affect any listed species, then the federal agency must write a biological assessment to determine what impacts the project is likely to have on the listed species. If the biological assessment shows that the project is likely to adversely affect a listed species, then formal consultation is requested. This process can take up to 90 days (or more if additional information is needed by US FWS) and once the formal consultation process is concluded, US FWS has another 45 days to prepare a biological opinion for the federal agency. This posed a potential problem at the Rocky Flats Site because the myriad of projects and activities required to close the site were all intertwined and on a tight schedule. As such, the delay of one project due to the US FWS approval process could potentially delay other projects. Some of the initial consultations between US DOE and US FWS about projects that were likely to adversely affect the Preble's mouse made it clear that conducting individual consultations for

every project was not going to work. Schedule impacts, delays, and cost increases for both small and large projects would inevitably occur. As a result, US DOE and US FWS agreed that a programmatic approach would be the most suitable means to address the complex list of projects that would have to occur for site cleanup and closure to be completed on time.

Preble's Mouse Ecology and Habitat at the Rocky Flats Site

At an elevation of approximately 1,830 meters (6,000 feet), Rocky Flats contains a unique ecotonal mixture of mountain and prairie plant species. This diverse ecology derives from the topography of the area and its proximity to the mountain front. Native plant communities at the site include the xeric tallgrass prairie, mesic mixed-grass prairie, shrublands, wetlands, and Great Plains riparian woodland communities. The spatial distribution of the plant communities is largely determined by the hydrology and soil types at the site. The drier pediment tops and hillsides are dominated by prairie. The underlying geology influences the locations of the more hydric communities at the site. Where the Rocky Flats Alluvium meets the underlying bedrock, groundwater seeps form on the hillsides and large, hillside-seep wetlands and shrubland communities occur at these locations. In the drainage bottoms—where intermittent and ephemeral streams flow—shrublands, wetlands, and Great Plains riparian woodland communities predominate. It is along these streams and wetter hillsides, where multistrata vegetation (i.e., a combination of understory grasses and forbs, along with shrubs and trees) exists, that the Preble's mouse is most commonly found.

The Preble's mouse is a small mammal (rodent) with large hind feet, a long bicolored tail, and a distinct dark stripe down the middle of its back that is bordered on either side by gray to orange-brown fur. The large feet are approximately 3 times the size of those of other mice and allow it to jump up to 3 feet at a time. The long tail makes up approximately 60 percent of its body length, which is about 9 inches for a typical adult mouse. The Preble's mouse is nocturnal, so during the day it resides in day nests composed of grasses and other plant material. Its preferred habitat is well-developed riparian habitat with adjacent grasslands and a nearby water source (Fig. 2). Well-developed riparian habitat consists of a combination of grasses, forbs, shrubs, and trees that provide good multistrata vegetation. The Preble's mouse also utilizes adjacent undisturbed grasslands and has been observed approximately 100 meters (300 feet) beyond the 100-year floodplain [2, 3].

Preble's mice typically have two litters per year, with an average of five young per litter. Their life span is up to 3 years and is long compared to most other species of mice and voles that often don't live 1 year. The Preble's mouse feeds on insects, seeds, fungi, and fruits, varying its diet throughout the season. In addition, the Preble's mouse is a true hibernator and enters hibernation in the fall (September through October) and emerges the following May. Its hibernacula are underground and are often found under various species of woody plants. The mouse does not store food, but rather lives off of fat stores it accumulates prior to entering hibernation [2, 3].

Threats to the Preble's mouse are predominately from habitat loss, alteration, fragmentation, and degradation. As development continues along the Front Range of Colorado, encroachment by humans into the once-undisturbed riparian habitats and adjacent grasslands continues to threaten the survival of the Preble's mouse. A recent 12-month status review on the Preble's mouse,

published in Volume 78 *Federal Register* page 31679 (78 FR 31679) on May 24, 2013, identified numerous threats to the mouse [4]. Some of the threats that were identified include agricultural land conversion, recreational trail development and use, habitat fragmentation, hydrologic changes in riparian ecosystems, aggregate mining, transportation corridors, noxious weeds and control measures, floods, wildfires, and predation.



Fig. 2. High-quality Preble’s mouse habitat along Woman Creek at the Rocky Flats Site.

The Rocky Flats Site Programmatic Approach to Consultation

To address the Section 7 consultation requirements for site activities, US DOE and its contractor began implementing the programmatic approach by compiling an exhaustive list of all of the projects and activities that might take place in Preble’s mouse habitat. Project managers were asked to generate a list of routine and project-specific activities that were planned through site closure. No activities were considered too small for the list since a biological assessment involves the evaluation of not only the impacts from individual activities, but also the cumulative effect of all of the activities. The list included activities as varied as walking to monitoring locations to collect data, mowing roadside edges, demolishing buildings, and breaching dams. Once the list was compiled, additional information on how activities were conducted was collected. The first questions were always whether impacts could be avoided altogether, whether the project or activity was necessary, and whether the purpose could be accomplished without entering the habitat. In most cases, the answer to all of the questions was no. The next question was how could

the impacts be minimized. Impacts to the Preble's mouse can be minimized by reducing the project footprint, reducing the time spent in its habitat, using existing roads, conducting activities when the mouse is in hibernation, leaving vegetation intact, using the smallest equipment necessary to accomplish the task safely, and using best management practices. Based on criteria developed with US FWS, activities were then classified as "no effect," "not likely to adversely affect," or "likely to adversely affect." For larger projects that were "likely to adversely affect," project footprints or construction boundaries (if available) were used to determine the size of the potential impacts. If these were not available, an estimate was used to determine the potential impacts. A geographic information system was used for most of the impact calculations and analyses. Project footprints were overlain on the Preble's mouse habitat and the area and acres of impact were determined. This area was then overlain on the Rocky Flats Site vegetation map to determine what quality of habitat was present in the project area. For "likely to adversely affect" impacts, mitigation is required. At the Rocky Flats Site, lower-quality habitat (grassland areas) are mitigated at a 1.5:1 ratio, while higher-quality habitat (wetlands, shrublands, riparian woodlands) are mitigated at a 2:1 ratio.

Unique to the Rocky Flats consultations was the fact that US DOE was not destroying habitat to put in a subdivision or a shopping mall, but was instead removing manmade structures to recreate natural habitat. In the end, US DOE will increase rather than reduce the amount of Preble's mouse habitat at the Rocky Flats Site as a result of these projects. The final Programmatic Biological Assessment (PBA) was approved in April 2004 when the Biological Opinion was received from US FWS. This document was used for all of the cleanup and closure activities.

To date, mitigation of approximately 47 acres has been required as part of closure and postclosure activities at the Rocky Flats Site. Monitoring requirements for mitigation areas are outlined in the PBA and monitoring will continue until success criteria (listed in the PBA) are met and concurrence is received from US FWS. An annual report that summarizes monitoring activities is due to US FWS by December 1 each year.

ESA Impacts on Postclosure US DOE LM Activities at the Rocky Flats Site

Once cleanup and closure activities were completed at the Rocky Flats Site, ongoing operations for monitoring and management at the site transferred to US DOE LM. It was originally assumed that very minimal postclosure activities would take place at the site; however, that has not proven to be the case. Postclosure activities include monitoring and maintenance of surface-water monitoring equipment, groundwater wells, groundwater treatment systems, telemetry equipment, landfill covers, dams, roads, fencing, signage, revegetation areas, Preble's mouse and wetland mitigation areas, and erosion controls, as well as maintenance of the all-terrain vehicles, storage sheds, Conex containers, and the equipment stored inside those containers. Additional field activities include weed control, reseeding, mowing operations, and occasionally addressing wildlife issues. Ten to 12 field personnel work at the site on a regular basis to maintain equipment and facilities, collect samples, manage the natural resources, and ensure that all processes are operating properly at the site.

The PBA that was approved in 2004 was written primarily for cleanup and closure activities, although some of the routine operations included in it have continued postclosure. The volume and

type of work that would be required postclosure, and the fact that a great deal of that work would take place along or near the streams (i.e., within Preble's mouse habitat), was not completely recognized prior to site closure. As a result, dozens of additional project-specific consultations have been conducted to address specific projects that were not included in the original PBA. This has required additional time and increased project costs because individual consultations with US FWS have been necessary. Also, in 2010 US FWS designated critical habitat at the Rocky Flats Site (as well as at several other locations along the Front Range) to provide additional protection for the Preble's mouse. This increased the total acreage of protected Preble's mouse habitat at the Rocky Flats Site, thus increasing the potential for impacts to projects at the site.

In an effort to reduce the number of future individual consultations and to incorporate postclosure routine and project-specific activities, the PBA was rewritten and updated in 2013 and submitted to US FWS. As in the original PBA, project managers were asked to list all routine and project-specific activities so that a list of projects to be completed at the Rocky Flats Site in future years could be generated. In addition, projects that were completed during site closure were removed from the PBA; new text was added to address the critical habitat that was designated at the site; cumbersome portions of the text were updated; flowcharts and criteria used to evaluate projects and classify them as "no effect," "not likely to adversely affect," or "likely to adversely affect" were updated to make them more objective and user-friendly; and the process of evaluating projects in the geographic information system and determining habitat quality was further defined.

Work on this new PBA is ongoing. Once it is approved, a simple email notification to US FWS will be all that is required for the projects that are listed in the PBA to proceed. This will streamline the process for both US DOE and US FWS, reduce project costs and potential schedule delays, and protect the habitat of the Preble's mouse at the Rocky Flats Site. This programmatic approach could prove useful for other US DOE sites with federally listed species.

To ensure requirements of the PBA are implemented for routine and project-specific activities, and required notifications to US FWS are made, Preble's mouse and PBA training and education is provided to project leads and field personnel. Keeping ESA issues in the mindset of project leads and field personnel has reduced the potential for problems and project delays. Project planning documents now have sections that address ESA issues and whether US FWS consultation or notification is required.

CONCLUSIONS

A programmatic approach to Section 7 consultations with US FWS was taken at the US DOE Rocky Flats Site. A master list of ongoing activities and other potential future activities was developed and evaluated in a PBA that was written for site activities. The PBA that was approved in 2004 worked well during closure, but did not address many ongoing, postclosure US DOE LM activities. As a result, the PBA was rewritten in 2013 to address postclosure routine and project-specific activities. The use of a programmatic approach has reduced the time and costs associated with getting individual US FWS approvals, which has in turn minimized impacts to schedules. The programmatic approach could prove useful for other US DOE sites with federally listed species.

REFERENCES

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