

Save The Poudre Coalition
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Comments on NISP DEIS Treatment of Preble's Meadow Jumping Mouse

Summary

By law, environmental impact statements must thoroughly and honestly consider proposed projects' potential impacts on federally-listed threatened and endangered species. 40 C.F.R. § 1508.8, 40 C.F.R. §. 1508.25. The NISP Draft Environmental Impact Statement (DEIS) fails to do this regarding the Preble's meadow jumping mouse (PMJM) a federally-listed threatened species. Without further analysis the DEIS will fail to meet the minimum legal requirements for an adequate EIS.

Furthermore, the Army Corps of Engineers has a duty under the Clean Water Act to deny the permit of a project such as NISP if the permit is contrary to the public interest. 33 C.F.R. § 320.4. NISP would cause irreparable and unnecessary harms to the Preble's meadow jumping mouse, and its proposed mitigation of those harms is demonstrably inadequate. Therefore the Corps is legally obliged to deny the applicants' permit for its preferred alternative (including the construction of the Glade reservoir and diversion of water from the Cache la Poudre River). The applicants may instead pursue other readily-available options (conservation, growth management, purchase of existing water supplies from willing sellers) that can achieve their actual water supply needs without pushing the Preble's meadow jumping mouse further down the road to extinction.

Background

Current distribution of Preble's meadow jumping mouse (PMJM) along Cache la Poudre River (Poudre River) and tributaries in NISP impact area (based on U.S. Fish and Wildlife Service database)

PMJM were last documented along the Poudre River in 1998 just north of County Road 23E by Tanya Sherk of the Colorado Division of Wildlife. This area is approximately 3 km upstream from the intersection of Old Highway 287 and Overland Trail in La Porte, Colorado. Two individuals were captured in 775 trapnights (1 trapnight = 1 trap set for one night).

In 2003, 6 different trapping efforts of approximately 1000 trapnights each were conducted along the unnamed tributary to the Poudre River By LWR Consulting. No PMJM were found.

However, two PMJM were captured by ERO Resources in 2004 in 500 trapnights along the same unnamed tributary to the Poudre River . The successful capture of PMJM was approximately 1 km south of the unsuccessful trapping efforts conducted by LWR Consulting, a point less than 1 km northwest of Ted's Place (intersection of US

Highway 287 and Colorado 14). The location of capture for these PMJM overlaps the location of the forebay for the proposed Glade Reservoir.

Relevant items from the PMJM Recovery Plan (Draft November 2003)

PMJM habitat can be described as well-developed riparian vegetation that includes a dense combination of grasses, forbs and shrubs. PMJM are typically found in multi-layered canopies of shrubs with dense grass and forb ground cover. One of the primary threats to PMJM conservation and recovery is the loss of appropriate riparian habitat. PMJM will also periodically use adjacent upland mixed grasslands for foraging and day nest habitat.

The primary reason for listing PMJM under the Endangered Species Act was the loss or degradation of riparian habitats within PMJM range (primarily along the Front Range). Another impact itemized in the PMJM Draft Recovery Plan is “Hydrologic Impairments and Ground Water Alterations.” The recovery plan states:

“...changes in the timing and abundance of water may be detrimental to the persistence of Preble’s in these riparian habitats...”

“...depletion of groundwater via wells and water diversions also affects the vegetation within Preble’s habitat. As groundwater supplies are depleted, more xeric plant communities replace riparian vegetation. The conversion of these habitats from mesic, shrub-dominated systems to drier grass-dominated systems would preclude Preble’s from these areas.”

Summary of likely PMJM impacts of the NISP alternatives (from NISP DEIS)

The preferred alternative (alternative 2) that includes Glade Reservoir would cause the loss of 50 acres of PMJM habitat and disturb another 26 acres of habitat, according to the NISP DEIS. The DEIS admits that this is a major negative impact on PMJM: “Alternative 2 and Subalternative 4.1 would involve the permanent loss of 50 acres of known Preble’s habitat, mostly in the southern portion of the proposed Glade Reservoir. This is considered a major long-term effect to Preble’s” (DEIS, p.4-67).

Constructing Glade Reservoir would directly destroy (by flooding for the reservoir) a variety of habitats that are used by PMJM, including mesic shrublands dominated by sandbar willow, chokecherry, wild plum, and skunkbush. In the sandbar willow drainages at the Glade Reservoir site, there is an understory of native species and some introduced grasses and weeds. Mesic mixed woodlands that would be impacted by the Glade Reservoir include plains cottonwood, peachleaf willow, sandbar willow, chokecherry, Wood’s rose, and wild plum. PMJM have been documented in similar mesic shrublands and woodlands within their range (Schorr 2008). Also, the palustrine persistent emergent wetlands and scrub-shrub habitats that would be impacted by the Glade Reservoir are comparable to areas where PMJM have been documented (Schorr 2008).

The actual impacts on PMJM habitat and potential habitat appear far greater than the destruction of 50 acres, however, once the likely impacts of dewatering a large stretch of the Poudre River, proposed under Alternatives 2, 3, and 4, are taken into account. Diversions of water would occur at the Poudre River Canal during high flows of late spring and early summer and would “affect flows in about 55 miles of the Poudre River from the Poudre River Canal to the confluence with the South Platte River” (DEIS). Additionally, water diversions that currently occur 23 miles downstream of the Poudre Valley Canal would occur at the Poudre Valley Canal. This “exchange would reduce existing flows in about 23 miles of the Poudre River from the Poudre Valley Canal...to about 12 miles downstream of Fort Collins” (DEIS). The reduction in heavy flows will prevent periodic flooding events that rejuvenate riparian vegetation along the Poudre River (City of Fort Collins 2008). This will cause the vegetation to become increasingly decadent. These changes will make it increasingly difficult to recover the riparian habitat along the Poudre River to suitable PMJM habitat (Armstrong 2008, Schorr 2008).

Some likely impacts to the Poudre River below the canyon, if NISP is built, are the following (from Ayers and Associates 2008 and City of Fort Collins 2008):

- Average reduction of flows within the urban reach (Fort Collins) of 30 – 40%.
- Increased deposition of fine sediment with less scouring and movement of fine or coarser sediment.
- Reduced scouring of plants and narrowing of the channel.
- Increase in water temperature, human generated chemicals and sewage, and reduced capacity for dilution of pollutants.
- Decadence of cottonwood forests and increase in stand age without young tree replacement.

Based on the Draft EIS and the scenarios presented above, NISP would eliminate PMJM habitat along several dozen miles of the Poudre River, likely reduce the number of individual PMJM, and inhibit establishment or restoration of PMJM along the Poudre River. These consequences are discussed in greater detail below.

It is important to emphasize that unlike building NISP, the “No Action” alternative would have no negative impacts on PMJM, since it would not require building a reservoir in PMJM habitat, or degrade riparian habitats along the Poudre River. Similarly, many conservation-minded solutions to NISP subscribers’ desire for increased water supplies—solutions summarily rejected in the DEIS—could be implemented with no harms to PMJM (see for example Western Resource Associates 2005).

Consequences to PMJM of Building NISP

1. Loss of PMJM individuals and habitat

The Glade Reservoir likely would reduce the number of PMJM individuals. PMJM were captured immediately southwest of the proposed Glade Reservoir and within 3 miles (4.8 km) of the proposed reservoir. The area of habitat that would be impacted by the Glade Reservoir is considered PMJM habitat because of its proximity to a known PMJM location and the dispersal ability of PMJM. It is reasonable to assume this area is occupied (Schorr 2008). Based on predictive modeling by the Colorado Division of Wildlife, several areas within the Glade Reservoir proposed site have “high probability” of PMJM presence. The area of PMJM habitat loss is identified as 50 acres with an additional 26 acres of temporarily-disturbed habitat. Given that PMJM abundances can be as high as nearly 70 PMJM per km of stream, and that the stream length disturbed by the Glade Reservoir appears to be approximately 10,000 ft (3 km; based on rough estimates from maps provided in the Draft EIS) over 200 PMJM could be removed. (It is possible that lower numbers of PMJM exist along this stretch of stream; however, no estimates of PMJM density exist for this area.)

The NISP project would reduce PMJM habitat. PMJM occupied or potential habitat extends into the proposed Glade Reservoir location, the Glade-to-Horsetooth Pipeline area, the No Action area, the Carter Pipeline area, and Highway 287 re-alignment area. Some of the disturbance is considered “temporary” in the Draft EIS, yet PMJM habitat areas that have been disturbed in the past have often failed to recover completely and provide habitat for PMJM (Schorr 2008). **It is important that impacts be considered permanent unless additional effort (such as trapping and population analysis) documents the recolonization of disturbed habitat.**

The DEIS does admit that the preferred alternative will destroy 50 acres of PMJM habitat and degrade another 26. It proposes to mitigate the 50 acres destroyed in a 1 to 1 ratio. This is insufficient for several reasons.

First, **appropriate mitigation on the “major” impact of removal of 50 acres of PMJM habitat should require documentation of successful mitigation.** Successful mitigation should be measured by whether the areas mitigated maintain populations of and habitat for PMJM to the same level as the existing habitat. For instance, when habitat along Lehman Run at the U.S. Air Force Academy was disturbed to create temporary water retention ponds, extensive trapping and telemetry efforts were conducted to document PMJM use of the area after mitigation (Schorr 2008). The burden of documenting “mitigation” is more appropriately placed on confirming PMJM use, rather than whether the habitat resembles other PMJM habitat. An appropriate consequence for failure to document PMJM use of the mitigated areas would be requirements to establish additional habitat in other areas within PMJM recovery zones.

Second, **most mitigation requirements for PMJM suggest that mitigation be done in greater than 1:1 replacement**, in recognition of its difficulty and in order to increase the likelihood of success. This is especially advisable when one is dealing with threatened or endangered species, where failure may be permanent. In a study for the proposed Halligan Reservoir Enlargement Project, researchers stated: "The most feasible method of

mitigation for impacts to PMJM would most likely be preservation of existing habitat. The USFWS indicated that mitigation ratios typically run 1.5-4.5, although they had one project at 10:1" (ECI 2002).

Given the general difficulties to successful mitigation of habitat loss noted in the scientific literature and given the specific difficulties to successful mitigation for PMJM habitat loss likely caused by the NISP project, noted throughout these comments, we believe mitigation levels should be increased to a minimum of 6 acres of restored or permanently protected PMJM habitat to every 1 acre of known habitat destroyed or degraded. Taking 76 acres as an absolute minimum for the amount of PMJM habitat destroyed or degraded (we believe, with the loss along the river corridor, this should actually be much higher) NCWCD should commit to creating or preserving a minimum of 456 acres of PMJM habitat—and to restoring populations of PMJM to those areas.

There are additional problems with the proposed mitigation:

* Mitigation may be impossible, given the need to line the Glade Reservoir forebay to prevent trichloroethene (TCE) release. In the part of the forebay slated to be used for mitigation of PMJM habitat, there may be difficulty in getting appropriate habitat established. Either TCE contamination may render the habitat toxic to PMJM; or, efforts to prevent leakage of contaminants, especially intrusive construction, may degrade the reconstructed habitat.

* Some areas in and around the NISP project may provide habitat for PMJM, but have not been sufficiently trapped to document presence (Schorr 2008). Habitat assessments were submitted to the U.S. Fish and Wildlife Service (USFWS). Although the USFWS concurred that some areas were not likely to house PMJM (e.g., Owl Canyon) no trapping effort was conducted in areas where habitat evaluations were conducted. It is possible these areas house PMJM. Areas north of this within Red Mountain Ranch look similar and were trapped because of the possibility that they might house PMJM (surveys conducted by Rob Schorr and Chris Gaughan of Colorado Natural History Program).

* Although many stretches of the Poudre River and its tributaries have been trapped for PMJM without success, there is the possibility PMJM exist within these stretches. After all: "Trapping can only confirm presence, not prove absence" (USFWS 2007, p. 63020). Documentation of PMJM presence is predicated on capture of PMJM using live traps. In at least one instance, an area of stream was trapped and failed to document PMJM, but was trapped one year later and PMJM were documented in the area (Monument/Fountain Creek near Woodman Road in Colorado Springs, Colorado) (Schorr 2008). Thus, it is possible PMJM still exist within some stretches of the Poudre River. This is important, because hydrologic changes that are expected to occur along the Poudre River could impact yet unidentified PMJM habitat, or may preclude the rehabilitation of lands adjacent to the Poudre River to support PMJM.

* PMJM on the Colorado Piedmont seem to exhibit seasonal changes in habitat. Where summer habitat is mostly in areas of dense, complex riparian vegetation in the floodplain,

hibernacula often have been found on terraces above the stream. In other words, summer habitat tends to be on the modern floodplain whereas hibernacula are often found well above the present-day floodplain, in the well-drained sands and gravels of the Ice Age (Pleistocene) floodplains of those drainages. Because of these seasonal movements, it is not enough to preserve riparian vegetation; upland habitats for hibernacula must be preserved as well (Armstrong 2008).

Comment [RS1]: This paragraph is an important addition. I neglected to make this case in my original document.

* There is a misconception that PMJM impacts can be minimized by disturbing habitat during the time period when PMJM are hibernating and not active. This is only true for above-ground disturbances. With soil disturbance, PMJM can be impacted to a greater extent during hibernation than when active. Because PMJM dig hibernacula and drop metabolism substantially they are unable to evade disturbances that require soil movement. Thus, a greater number of PMJM may be uncovered or buried by ground-disturbing activities (Schorr 2008).

In one of many statements that suggest a cavalier disregard for the wildlife impacts of this project, the Draft EIS states that it is “unlikely” that PMJM would be discovered during excavation or land-moving exercises. However, this does not mean that the activities are unlikely to impact PMJM individuals. The discovery of PMJM individuals is unlikely because PMJM are small rodents (approximately 20 grams) that will be hibernating approximately 18 inches below ground. It is unlikely that such a small animal will be identified during the earth-moving processes. This should not be misconstrued as the reduced likelihood of such activities having an impact on populations. When conducting telemetry on PMJM researchers have found individuals difficult to see when they were within 5 feet. It would not be surprising that individuals would not be discovered (despite their presence) during the large land-moving operations required for Glade Reservoir.

2. Loss of conservation potential

Movement of PMJM and possible expansion of known populations

Based on mark-recapture studies along Monument Creek, El Paso County, PMJM have been known to travel greater than 4 km (Schorr 2003). It is likely that PMJM travel farther, but knowledge about movement is restricted to documentation of marked individuals and selective placement of live-trapping efforts. Previous radio-telemetry efforts were unable to document the long distance movements that occur over the lifespan of individual PMJM. Thus, PMJM may have expanded from areas of known occupancy to other areas along the Poudre River.

Given the movement potential of PMJM it is premature to assume that PMJM could not recolonize the Poudre River through Fort Collins (Armstrong 2008, Schorr 2008). If the hydrologic changes from NISP occur, however, this possibility would likely be permanently foreclosed and it would likely become impossible to rehabilitate the Poudre River to support populations of PMJM.

PMJM have not been documented downstream of La Porte along the Poudre River recently, but they have been documented there historically, including in Greeley (USFWS 2007, pp. 62999, 63004-5). The reduction of flows and alterations of existing habitat (as described in the NISP plan) will permanently preclude PMJM from expanding along this stretch of river. Permanent removal of potential habitat would limit the connection of PMJM populations between the Poudre Canyon and North Poudre River populations and those along the South Platte River, with possibly deleterious genetic effects to the species.

PMJM recovery and Restorations along the Poudre River

Draft recovery requirements request that 2 large (>2500 PMJM individuals), 3 medium (500 – 2499 individuals), and 18 small (persistence of PMJM within approximately 3 miles of habitat; expected mean of 150 individuals) populations be maintained within the South Platte River drainage (USFWS 2007). The Glade Reservoir could jeopardize recovery efforts in the South Platte River drainage by reducing the PMJM populations near the proposed Glade Reservoir to levels so low that they are unsustainable. Conservation biology has identified rare species populations that have been reduced to such low levels they were unsustainable, despite the presence of reproductively-capable individuals. It is possible that impacts to the habitat patches in and around the proposed Glade Reservoir would be reduced to the point remaining individuals could not persist. The DEIS does not take this possibility into account.

The PMJM Recovery Plan may eventually provide mechanisms to restore populations of PMJM to previously-occupied habitat. The Poudre River is considered previously-occupied habitat and could be rehabilitated to standards that would make it a candidate for PMJM restoration (USFWS 2007). Currently the PMJM Recovery Plan has not identified sites for potential reintroduction. However, given the abundance of open-space lands along the Poudre River in Fort Collins, and the Recovery Plan's prioritization of publicly-managed lands for PMJM conservation, this stretch of the Poudre River could be a candidate area for PMJM reintroduction. Tragically, though, the water alterations described by the NISP plan would preclude the necessary hydrology for maintenance or rehabilitation of habitat for PMJM along the Poudre River below Laporte.

Summary

At a minimum, the NISP DEIS should have considered the above described aspects of the projects' likely and potential effects on PMJM. Its failure to do so, when combined with its failure to consider impacts on other threatened and endangered species, its failure to consider other environmental impacts (such as the likely shrinking of cottonwood / willow forests along the Poudre riparian corridor, its likely harms to nesting and breeding birds along the corridor, etc.), and its failure to honestly consider alternatives to building Glade Reservoir which could meet the region's water needs in a less environmentally harmful manner, all constitute an overall failure of the NISP DEIS to meet the minimum requirements for an EIS. The Corps should therefore direct Northern Colorado Water Conservancy District (NCWCD) to scrap the existing DEIS and start over on a more

comprehensive and more honest DEIS of this project. At a bare minimum, the Corps should prepare a supplemental analysis that addresses the shortcomings of its analysis and mitigation plan for the project's impacts on PMJM.

However, we believe our own analysis of the likely effects on PMJM, when combined with information in the DEIS, also argue for simply scrapping the NISP project. Additional analysis will further support this conclusion that NISP would cause irreparable and unnecessary harms to the Preble's meadow jumping mouse, and the proposed mitigation of those harms is demonstrably inadequate. The Corps should protect the public interest following its duties under the Clean Water Act and deny the permit (33 C.F.R. § 320.4). This action would leave NCWCD free to drop plans for NISP and instead pursue water conservation, water fallowing arrangements with local farmers, purchases of water from willing sellers on the open market, or other measures, which could meet their water supply needs of the NISP subscriber communities without harming PMJM or other threatened and endangered species.

References

Armstrong, David. 2008. Personal communication. Armstrong is a mammalogist at the University of Colorado, Boulder, who has written extensively on the Preble's meadow jumping mouse.

Ayers and Associates. 2008. "Preliminary Identification of Potential Impacts of Glade Reservoir on the Cache la Poudre River."

City of Fort Collins. 2008. "Characterizing the Cache la Poudre River: Past, Present, and Future: A Summary of Key Findings by the Poudre Technical Advisory Group."

ECI. 2002. "Halligan Reservoir Enlargement Project: Feasibility Study Final Report."

Schorr, Robert. 2003. "Meadow jumping mice on the U.S. Air Force Academy, El Paso County, Colorado: Populations, movement and habitat from 2000-2003." Available online at www.cnhp.colostate.edu.

Schorr, Robert. 2008. Personal communication. Schorr is a zoologist in the Fish, Wildlife and Conservation Biology Department, Colorado State University, Fort Collins, CO. He has trapped and studied Preble's meadow jumping mouse.

USFWS. 2007. "Endangered and Threatened Wildlife and Plants; Revised Proposed Rule To Amend the Listing for the Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*) To Specify Over What Portion of Its Range the Subspecies Is Threatened; Proposed Rule." Federal Register, 50 CFR Part 17, November 7, 2007, pp. 62992-63024.

Western Resource Associates. 2005. "Facing Our Future: A Balanced Water Solution for Colorado."

Addendum: further comments based on “Revised Proposed Rule to Amend the Listing for the Preble’s Meadow Jumping Mouse” (USFWS 2007)

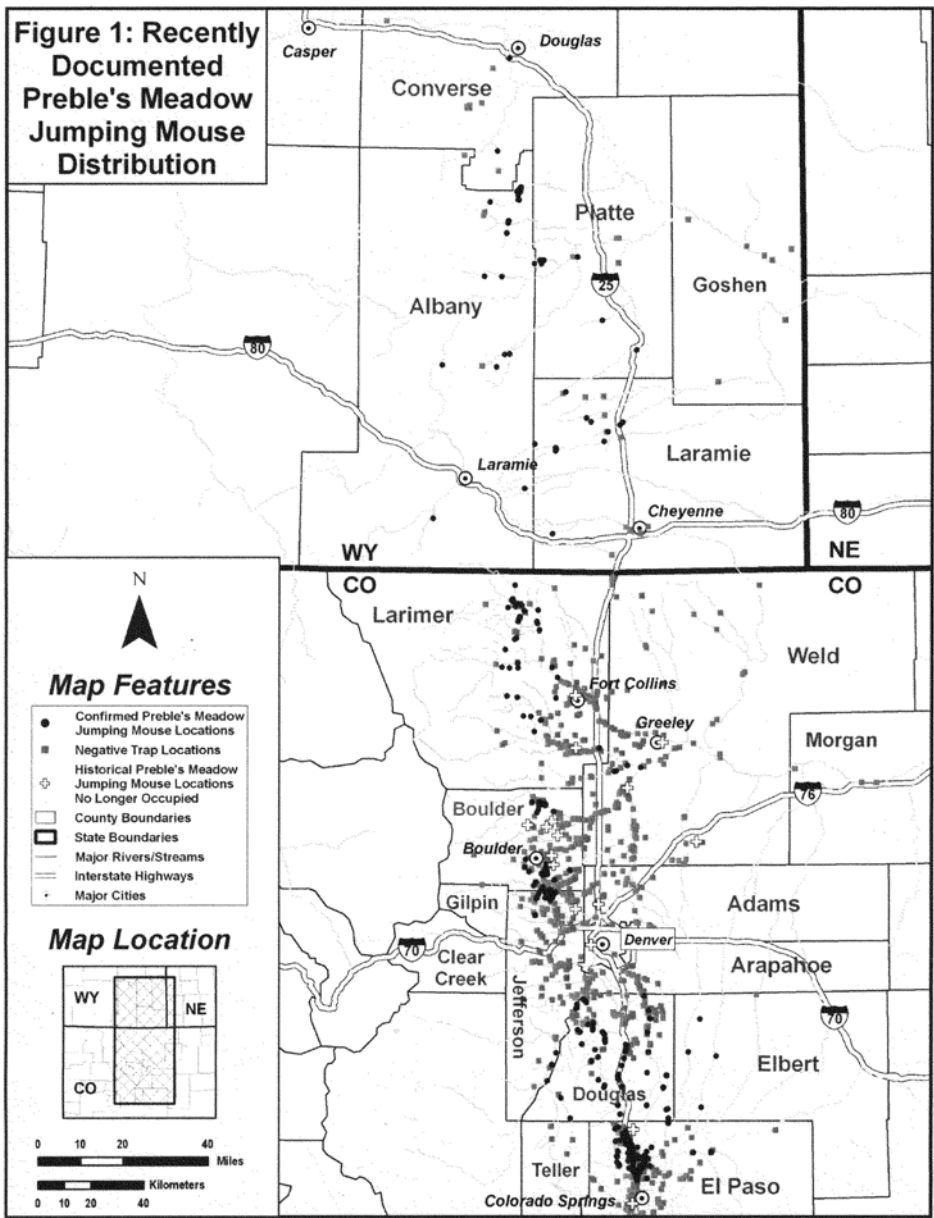
USFWS states: “Despite a number of trapping efforts, no jumping mice have been recently documented within the Fort Collins, Larimer County, area or downstream on the Cache La Poudre River to its confluence with the South Platte River at Greeley, Weld County” (USFWS 2007, p. 63001).

However, they also remind us: “Trapping can only confirm presence, not prove absence” (p. 63020). **We believe it is better not write off any potentially important habitat, without a much more careful search for PMJM populations.**

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USFWS reminds us: “Records establish that the Preble’s meadow jumping mouse was present in a range that included major plains streams from the base of the Colorado Front Range east to at least Greeley, Weld County (Armstrong 1972, p. 249; Fitzgerald et al. 1994, p. 293, Clippinger 2002, p. 18). Recent trapping efforts have documented that the Preble’s meadow jumping mouse is rare or, perhaps, absent from these same areas today (Ryon 1996, p. 2; Clippinger 2002, p. 22; Service, 2007). This pattern is especially apparent along prairie riparian corridors directly or indirectly impacted by human development” (pp. 63004-5).

They also provide the following map of recent and historic PMJM distribution (p. 62999):



We believe it is a mistake to write off large swathes of historic PMJM habitat and potential reintroduction habitat, as does the NISP DEIS.

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USFWS states: “As of August 2007, we have conducted 124 formal section 7 consultations (109 in Colorado, 15 in Wyoming) and issued 19 HCP related incidental take permits (all in Colorado) for projects affecting the Preble’s meadow jumping mouse. We have authorized take for actions that did not result in jeopardy but nevertheless resulted in permanent impacts to over 320 hectares (ha) (800 acres (ac)) of Preble’s meadow jumping mouse habitat, and temporary impacts to more than twice that amount of land. These projects have incorporated conservation measures or mitigation to avoid or minimize adverse impacts to the Preble’s meadow jumping mouse. However, even with the protections afforded to the species under section 7, habitat overall has continued to decline in quality and quantity, especially in Colorado” (p. 63006).

Multiply this trend out for only the next one hundred years, and we lose most existing PMJM habitat in Colorado. This is the well-known “death by a thousand cuts” that has driven many species to extinction. The Corps and USFWS should take this into account before permitting NISP.

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USFWS states: “In our listing decision, we stated that Preble’s meadow jumping mouse populations had experienced a decline and faced continued threats linked to widespread loss and fragmentation of the subspecies’ required riparian habitat from human land uses including: urban, suburban, and recreational development; highway and bridge construction; water development; instream changes associated with increased runoff and flood control efforts; aggregate (sand and gravel) mining; and overgrazing (63 FR 26517, May 13, 1998). These human land-use activities affect the Preble’s meadow jumping mouse by directly destroying its protective cover, nests, food resources, and hibernation sites; disrupting behavior; or acting as a barrier to movement. We noted that such impacts reduced, altered, fragmented, and isolated habitat to the point where Preble’s meadow jumping mouse populations may no longer persist. We also noted that patterns of capture suggested that Preble’s meadow jumping mouse populations fluctuate greatly over time at occupied sites, raising questions regarding security of the many currently documented populations which are isolated and affected by human development” (p. 63004).

These are exactly the kinds of habitat destruction and population fragmentation that NISP will also cause.

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USFWS states: “Thus, changes in the timing and abundance of water can be detrimental to the persistence of the Preble’s meadow jumping mouse in these riparian habitats due to resultant changes in vegetation (Bakeman 1997, p. 79). Changes in hydrology may occur in many ways, but two of the more prevalent are the excessively high and excessively low runoff cycles in watersheds with increased areas of paved or hardened surfaces, and disruption of natural flow regimes downstream of dams, diversions, and alluvial wells (Booth and Jackson 1997, pp. 3–5; Katz et al. 2005, pp. 1019–1020) (p. 63009).

These are exactly the kinds of hydrological changes and harms to PMJM habitat that NISP will also cause. The NISP DEIS denies any impacts on PMJM of dewatering the Poudre River, stating: “Flow reductions on the Poudre River associated with the action alternatives are unlikely to affect Preble’s. There are no known populations of Preble’s on the Poudre River below Laporte.” (DEIS, p. 4-67). However, there could be unknown PMJM populations below Laporte, and there certainly is potential habitat that could prove crucial in restoring PMJM to Colorado and eventually taking it off the endangered species list.

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USFWS states: “Efforts to restore degraded riparian habitats have occurred in Colorado, in part to benefit the Preble’s meadow jumping mouse. Efforts to restore Preble’s meadow jumping mouse habitat through a 0.86 km (0.54 mi) urban stream reach of East Plum Creek, Douglas County appear to have increased vegetation cover and Preble’s meadow jumping mouse numbers (Bakeman 2006, pp. 4, 8).” (p. 63009).

So, restoration efforts can have some success! Let’s not rule them out for lands along the Poudre River below Laporte, by degrading potential habitat so that it is no longer suitable for PMJM.

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USFWS states: “Colorado’s Comprehensive Wildlife Conservation Strategy lists “scarcity” as a threat to meadow jumping mice that may lead to inbreeding depression (CDOW 2006, p. 102). Small populations can be threatened by stochastic, or random, changes in a wild population’s demography or genetics (Brussard and Gilpin 1989, pp. 37–48; Caughley and Gunn 1996, pp. 165–189). A stochastic demographic change in small populations, such as a skewed age or sex ratio (for example, a loss of adult females), can negatively affect reproduction and increase the chance of extirpation. Isolation of populations may disrupt gene flow and create unpredictable genetic effects that could impact Preble’s meadow jumping mouse persistence in a given area. While the susceptibility of the Preble’s meadow jumping mouse to such events has not been researched, the documented tendency for Preble’s meadow jumping mouse populations to vary widely over time heightens concern for small and isolated populations. The lowest population numbers of Preble’s meadow jumping mice more accurately reflect potential vulnerability than typical or average population numbers present. Although many trapping efforts have targeted Preble’s meadow jumping mice in small, isolated reaches of habitat, few have documented presence. As noted above, we believe populations in Colorado would be at higher risk because development pressures in this portion of the range are more likely to result in small, fragmented and unsustainable populations” (p. 63016).

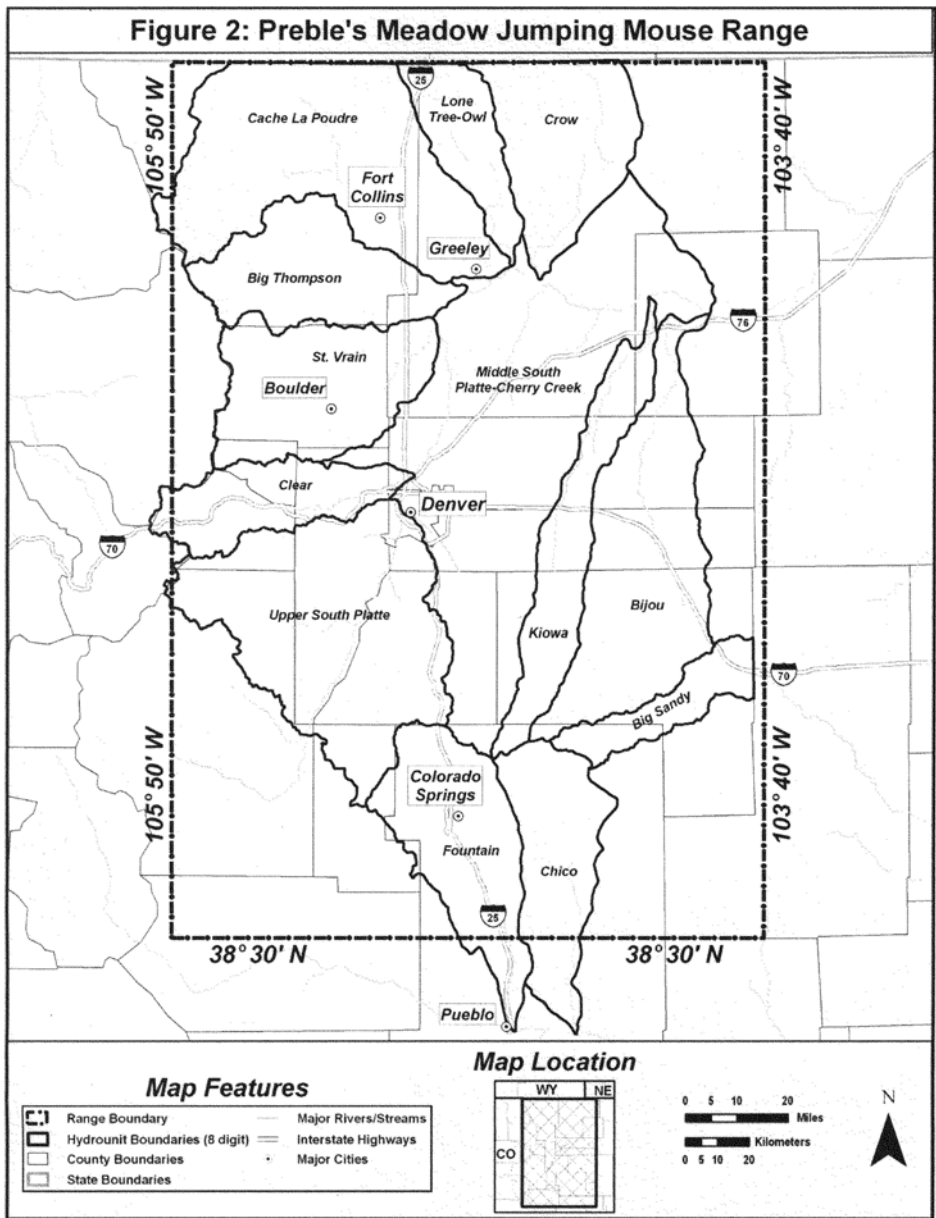
All this suggests that further fragmenting PMJM populations is a bad idea and that preserving connections between populations, or reconnecting severed populations, may be key to the species’ long-term survival.

After all, as USFWS states: “Redundancy of populations may be needed to provide a margin of safety for the subspecies to withstand catastrophic events” (p. 63018).

So why write off potential downriver populations farther downstream along the Poudre? Why permanently foreclose reestablishing populations farther down the river, which could link Poudre PMJM populations with other populations in the South Platte drainage, through connectivity along the South Platte River? We should be trying to restore PMJM habitat and mouse populations along the Poudre River, not foreclose their possibility.

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After all, as the USFWS states, the lower reaches of the Cache la Poudre River are within the PMJM’s historic range and within the range that needs to be considered in order to re-establish PMJM to ecological health (p. 63021):



USFWS further states: “The intent of the Preliminary Recovery Plan was to preserve populations throughout the existing range to maximize the preservation of the remaining genetic diversity that may be present” (p. 63020).