

## APPENDIX B

### **Economic Impacts on Agricultural Activities in Wyoming Attributable Primarily to Sections 9 and 10 of the Endangered Species Act**

#### **BACKGROUND**

1. As stated previously, economic analyses of critical habitat designation typically focus on economic impacts to land uses associated with implementation of section 7 of the Act. However, some agricultural operators in Wyoming have expressed concern that they will be required to alter the management of their lands that fall within the proposed critical habitat designation to assure the survival of the PMJM and conservation of its habitat, regardless of whether they plan any changes to land use or agriculture activity in the future. Specifically, some landowners are concerned that section 7 implementation could: (1) result in a loss of discretion in their land management practices; (2) reduce or restrict irrigation ditch maintenance activities to the point that they would be unable to divert sufficient irrigation water; and/or (3) severely restrict or possibly end grazing and haying activities in critical habitat areas. These landowners fear that excessive restrictions on grazing, haying, and ditch maintenance activities would force them to reduce the size of their livestock herds, and in some cases may force them out of business.
2. The proposed critical habitat designations for the PMJM will affect private landowners in Wyoming only if a Federal nexus exists with respect to their farming or ranching operations. The existence of a Federal nexus could subject private landowners to a section 7 consultation with the Service as a condition of Federal approval of a project on private land holdings in critical habitat areas. Situations which involve a Federal nexus are discussed in section 5 of this report.
3. Because most activities on private lands in Wyoming in the areas proposed as critical habitat generally do not involve a Federal nexus, many of the concerns expressed by landowners in response to the proposed critical habitat designation appear to be related more to sections 9 (which prohibits destruction or “take” of endangered species) and 10 (which allows for incidental take of endangered species) of the Act, rather than to section 7 of the Act (which provides mechanisms to ensure that federally authorized, permitted, or funded activities do not jeopardize the continued existence of the species or result in destruction or adverse modification of critical habitat). Sections 9 and 10 of the Act apply to all landowners with PMJM on their property regardless of whether a Federal nexus exists or whether their property is located within critical habitat.
4. Because the PMJM inhabits riparian areas in or surrounding irrigation ditches and hay fields, some incidental take of individual mice is inevitable during normal farming and

ranching operations in the mouse's range. Thus, the effects of section 9 restrictions on "take" are expected to be more wide ranging and potentially more significant than those associated with the proposed critical habitat designation under section 7 of the Act. This appendix discusses some of the impacts of sections 9 and 10 on agriculture activities occurring within critical habitat areas.

## **SCOPE OF AGRICULTURAL PRODUCTION IN PROPOSED CRITICAL HABITAT IN WYOMING**

5. As background for the discussion of these potential impacts, it is useful to estimate the total annual value of agricultural production in areas proposed for critical habitat protection in Wyoming. Appropriate measures of agricultural value include: (1) the value of the agricultural products produced each year in critical habitat areas; (2) the net value of farm and ranch income generated by that agricultural output; and (3) the indirect effects of that production and income on the Wyoming economy. Because these estimates reflect the total value of agricultural production and associated net income of all farms and ranches within the proposed critical habitat areas in Wyoming, these measures constitute the maximum potential magnitude (i.e., upper bound) of any economic impacts attributable to sections 9 and 10 of the Act. In other words, the impact of sections 9 and 10 cannot exceed the net value of agricultural production in this area.
6. The value of agricultural production in proposed critical habitat areas can be estimated by the market price of the hay production and grazing activities that take place in those areas.<sup>1</sup> Of the 20,253 acres proposed as critical habitat in Wyoming, the majority are used for either haying or grazing activities. Although 19 percent of this acreage consists of state and Federal land holdings, most of these public lands are grazed through permits and lease arrangements. The lands proposed for designation that are not currently in agricultural use include a small amount of acreage in Chugwater, lands on the F.E. Warren Air Force Base near Cheyenne, and lands devoted to home sites, roads, railways, woodlots, etc. Of the lands proposed for designation, approximately 19,000 acres are currently in agricultural use. Of these 19,000 acres, approximately 7,500 acres are in hay production and the remaining 11,500 acres are used primarily for grazing.<sup>2</sup>
7. The annual value of hay production on proposed critical habitat lands can be estimated as the average production in tons per acre multiplied by the average market price per ton multiplied by 7,500 acres. Although hay prices have spiked recently due to drought, \$100 per

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<sup>1</sup> This analysis follows the commonly used partial-budget approach of valuing hay and grazing output at market prices, rather than estimating changes in livestock production based upon changes in feed availability.

<sup>2</sup> These estimates are based upon data compiled from *Irrigated Lands Mapping North Platte Basin*, Wyoming, as filed in *Nebraska v. Wyoming*, No. 108 Original.

ton is a reasonable average long-term price.<sup>3</sup> Based upon conversations with ranchers and data from the Wyoming Agricultural Statistics Service, annual hay yields in proposed critical habitat areas range from 1.25 to 2.5 tons per acre, including any post harvest grazing.<sup>4</sup> Assuming an average yield of two tons per acre, the value of hay production in proposed critical habitat areas is approximately \$1.5 million annually.

8. The annual value of grazing on proposed critical habitat lands can be estimated as the average productivity of the land in AUM's per acre multiplied by the average market price per AUM multiplied by 11,500 acres. Grazing prices in Wyoming in 2001 averaged \$12.90 per AUM, and typical grazing lands in eastern Wyoming have averaged 0.67 AUM's per acre in recent years.<sup>5</sup> Thus, the estimated value of grazing on proposed critical habitat areas in Wyoming is approximately \$100,000 annually, bringing the total estimated value of agricultural production in proposed critical habitat areas to \$1.6 million annually.
9. The farm and ranch net income associated with this agricultural production can be estimated by subtracting the variable production costs associated with haying and grazing activities in critical habitat areas in Wyoming. Most of these costs are associated with hay production. Based upon crop enterprise budgets developed by the University of Wyoming, variable hay production costs (i.e., repair and maintenance, labor, fuel, and purchased water) in southeast Wyoming are estimated to be about \$20 per ton.<sup>6</sup> Variable production costs associated with grazing are relatively small and have not been estimated. Subtracting variable hay production costs from the value of total output (\$1.6 million) results in net income of approximately \$1.3 million annually. This net income accrues to the estimated 60 landowners currently operating in the proposed critical habitat areas.<sup>7</sup> Thus, the average landowner generates about \$21,700 in net income each year from agricultural operations in proposed critical habitat areas in Wyoming.
10. The agricultural output and net income generated on lands proposed for critical habitat designation also have indirect impacts on the Wyoming economy. According to the

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<sup>3</sup> *Wyoming Agricultural Statistics*, 2002, Wyoming Agricultural Statistics Service, Cheyenne.

<sup>4</sup> Id.

<sup>5</sup> These estimates are taken from *Wyoming Farm, Ranch, and Rural Land Market: 1999-2000*, University of Wyoming Agricultural Experiment Station Bulletin B-1130; and *Wyoming Agricultural Statistics*, Wyoming Agricultural Statistics Service, 2002.

<sup>6</sup> *Crop Enterprise Budget: Alfalfa Hay Baled, Wheatland Area*. University of Wyoming Cooperative Extension Service Publication MP-72.1, August 1994.

<sup>7</sup> Personal communication with Service personnel, Cheyenne Field Office, October 31, 2002.

U.S. Department of Commerce, the multiplier for agricultural earnings in Wyoming is 3.36.<sup>8</sup> Therefore, the \$1.3 million in annual earnings attributable to agricultural production from critical habitat areas produces a total annual income of \$4.4 million in the Wyoming economy. This estimate represents the maximum economic impact that might be expected due to enforcement of provisions of the Act in proposed critical habitat areas in Wyoming. Because the Act is unlikely to halt agricultural production in critical habitat areas, the impact would probably be significantly lower than this upper bound estimate.

## **IMPACTS OF THE ACT TO NON-FEDERAL LANDOWNERS**

11. This section describes some of the impacts of sections 9 and 10 on agriculture activities occurring within the areas proposed as critical habitat for the PMJM in Wyoming. Specifically, this section discusses potential benefits currently accruing to landowners as a result of a special regulation exempting certain agricultural activities from take under section 9, and the courses of action available to landowners regarding these specific agricultural operations once this special regulation expires.

### **Potential Economic Impacts Associated With Sections 9 and 10 of the Act**

12. The economic impacts associated with section 9 restrictions on take would likely be considerably smaller than the total value of agriculture production from proposed critical habitat areas because the Act contains provisions that allow individual landowners to apply for an incidental take permit. The incidental take permit allows for lawful pursuit of normal agricultural activities even if such activities result in take of the PMJM. The incidental take permit is obtained through section 10 of the Act, which requires the applicant to prepare, and the Service approve, an HCP. The HCP may include certain restrictions to agricultural activities to minimize incidental take of the PMJM.
13. The types of restrictions the Service might impose on agricultural activities to minimize take are expected to vary significantly from one application to another, depending upon the specific situation. However, service guidelines call for mitigating the take of PMJM to the maximum extent practicable. Examples of mitigation conditions include fencing, planting willows, or other measures intended to create a buffer zone along waterways in riparian areas. The Service may also impose restrictions on the methods or timing of activities associated with irrigation ditch maintenance.<sup>9</sup>
14. The primary economic impacts to landowners associated with enforcement of the Act, as it relates to agriculture activities in southeast Wyoming, are the costs of preparing HCPs

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<sup>8</sup> U.S. Department of Commerce, Bureau of Economic Analysis. *Regional Economic Multipliers: A User Handbook for the Regional Input-Output Modeling System (RIMS II)*. Second Edition, May 1992.

<sup>9</sup> Personal communication with Service Biologist, Cheyenne Field Office, December 4, 2002.

for the PMJM and the costs associated with any activity restrictions imposed by the Service to minimize take of PMJM.<sup>10</sup> These impacts potentially affect not only agricultural operations in proposed critical habitat areas, but all agricultural operations in southeast Wyoming within the PMJM's range.

### **Special Rule 4(d)**

15. As described in the previous section, take of a listed species by non-Federal property owners without a Federal nexus is typically permitted through the process set forth in section 10 of the Act. However, in 2001 and 2002, the Service adopted special regulations pursuant to section 4(d) of the Act for the PMJM. Specifically, these regulations provide exemption from take provisions under section 9 for certain activities related to rodent control, ongoing agricultural activities, landscape maintenance, perfected water rights, certain noxious weed control, and ditch maintenance activities.<sup>11</sup> These regulations were implemented to provide the landowner time to prepare an HCP and apply for an incidental take permit in order to comply with section 9 of the Act.<sup>12</sup>
16. Because section 4(d) delays the economic impacts associated with enforcement of section 9 of the Act, it has not resulted in any additional costs to landowners. However, when these special regulations expire on May 21, 2004, landowners will no longer be exempt from section 9 prohibitions against take, and the full impacts of section 9 take may be felt by those agricultural operators in southeast Wyoming operating without an incidental take permit. The Service encourages landowners to develop HCPs under Section 10 prior to the expiration of rule 4(d).

### **Options Available When Special Rule 4(d) Expires**

17. Following the expiration of rule 4(d), agriculture producers will likely choose one of three courses of action associated with agricultural activities that may result in incidental take of PMJM, but do not involve a Federal nexus. First, producers could continue irrigation, haying, and grazing activities without applying for an incidental take permit. This option would potentially minimize impacts of the Act upon production costs if the producers do not

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<sup>10</sup> If the Service were to impose additional restrictions on incidental take permits in critical habitat areas to prevent destruction of that habitat, then the incremental cost of those restrictions would be attributable to the critical habitat designation rather than section 9.

<sup>11</sup> U.S. Fish and Wildlife Service, "Endangered and Threatened Wildlife and Plants; Final Special Regulations for the Preble's Meadow Jumping Mouse," 66 *FR* 28125, May 22, 2001; and U.S. Fish and Wildlife Service, "Endangered and Threatened Wildlife and Plants; Amended Special Regulations for the Preble's Meadow Jumping Mouse," 67 *FR* 61531, October 1, 2002.

<sup>12</sup> Endangered and Threatened Wildlife and Plants; Final Special Regulations for the Preble's Meadow Jumping Mouse, 66 *FR* 99, May 22, 2001.

voluntarily undertake actions to minimize take. However, regardless of whether producers attempted to minimize take under this option, they would still be subject to the risk of take and subsequent penalties for violating section 9 of the Act. The costs to producers of these potential penalties are uncertain and difficult to estimate.

18. As a second possibility, producers could discontinue production activities to avoid both incidental take of PMJM and the need to develop an HCP. This scenario is considered unlikely, but if all producers selected this option, the result would be the loss of \$1.6 million annually in agricultural production in critical habitat areas as described above. The area wide impacts across the PMJM's range would be much larger because it would include all agriculture producers within the PMJM listing range, which extends beyond the proposed critical habitat area.
19. As a third option, producers could develop an HCP and apply for an incidental take permit under section 10 of the Act. The costs associated with developing the HCP, and the costs of modifications to customary production activities recommended by the Service would comprise the economic impacts attributable to sections 9 and 10 of the Act. However, based on conversations with county representatives and private landowners, it is unlikely that HCPs will be developed to minimize take associated with agricultural operations. Reasons why landowners do not plan to develop HCPs are as follows: (1) the cost of preparing HCPs may be large; and (2) agriculture producers feel that HCPs would require project modifications that would impose significant costs on their agriculture operations.

## **DESCRIPTION OF TYPES OF IMPACTS**

20. The primary land use activities likely to be impacted by sections 9 and 10 of the Act are haying and grazing, and irrigation ditch maintenance.<sup>13</sup> This section describes the potential impacts to landowners associated with these agricultural operations once the special 4(d) regulation expires in May 2004.

### **Irrigation Canal and Ditch Maintenance Activities**

21. The three commonly used methods of ditch maintenance are burning, flushing (flowing water through a ditch to clear blockages), and dipping (mechanically clearing blockages). Of these three options, the most cost effective is burning, which may also be the most likely to result in incidental take of PMJM. Because of this, some landowners are concerned that the burning will be prohibited, or severely restricted, after the expiration of special rule 4(d). This would have significant impacts on their irrigation activities.

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<sup>13</sup> Personal communication with Service Biologist, Cheyenne Field Office, November 25, 2002; personal communication with Don Britton, WID, October 18 - 31, 2002.

22. Although irrigation ditch maintenance is not a major cost item for most individual agriculture producers under current conditions, restrictions on the burning of ditches could force some producers to acquire new mechanical cleaning equipment or hire the use of such equipment on a custom basis. Both of these options would increase a producer's costs.
23. An example of the potential impacts to irrigation canal and ditch maintenance is illustrated using estimates developed by the WID. Although WID does not own lands in the proposed critical habitat areas, similar percentage increases would likely accrue to those operators with irrigation ditches in the areas proposed for critical habitat designation. WID estimates that its annual irrigation ditch maintenance costs would increase by approximately 250 percent if burning is reduced by 50 percent.<sup>14</sup> If all burning were prohibited, irrigation ditch maintenance costs could increase by approximately 400 percent annually.<sup>15</sup>

### **Haying and Grazing Activities**

24. Haying and grazing activities would also be subject to sections 9 and 10 of the Act to minimize take of the PMJM. To avoid violating this provision, landowners would have to either cease activities that might result in incidental take, or submit to the Service an application for an incidental take permit, including an HCP. As with irrigation canal and ditch maintenance activities, landowners could expect some restrictions or conditions on haying and grazing activities as mitigation for the incidental take of PMJM.<sup>16</sup>
25. The types of restrictions or conditions would vary depending upon the situation. In situations where riparian areas have been degraded by intensive grazing activity, mitigation measures for an incidental take permit may include restrictions on the number of AUM's within riparian areas, the construction of fencing with water gaps to keep herds out of riparian areas, and planting willows along stream banks. In situations where riparian areas are not degraded, mitigation measures may be minimal. The economic impacts of sections 9 and 10 of the Act on haying and grazing activities can thus be expected to vary widely from landowner to landowner.<sup>17</sup>

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<sup>14</sup> Total cost of ditch maintenance is approximately \$34,800, and involves burning, dipping, and cleaning activities. If burning activities were reduced by 50 percent, following the expiration of the 4(d) Special Regulation, it is estimated that total ditch maintenance costs would increase to approximately \$86,200. Personal communication with Don Britton, WID, December 9, 2002.

<sup>15</sup> This analysis assumes that there are adequate water supplies in Wyoming should flushing become the primary ditch maintenance method after expiration of Special Rule 4(d). If burning is not permitted following expiration of the 4(d) Special Regulation, it is estimated that total ditch maintenance costs would increase to approximately \$144,900. Personal communication with Don Britton, WID, October 18-31, 2002, December 9, 2002.

<sup>16</sup> Personal communication with Service personnel, Cheyenne Field Office, November 26, 2002.

<sup>17</sup> Personal communication with Service personnel, Cheyenne Field Office, December 4, 2002.

