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## **EFFECTS OF WOLF REMOVAL ON LIVESTOCK DEPREDATION RECURRENCE AND WOLF RECOVERY IN MONTANA, IDAHO AND WYOMING**

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Wolf predation on livestock and management methods used to mitigate conflicts are highly controversial and scrutinized especially where wolf populations are recovering. Wolves are commonly removed from a local area in attempts to reduce further depredations, but the effectiveness of such management actions is poorly understood. We compared the effects of 3 management responses to livestock depredation by wolf packs in Montana, Idaho, and Wyoming: no removal, partial pack removal, and full pack removal. From 1989 to 2008, we documented 967 depredations by 156 packs: 228 on sheep and 739 on cattle and other stock. Median time between recurrent depredations was 19 days following no removal ( $n = 593$ ), 64 days following partial pack removal ( $n = 326$ ), and 730 days following full pack

removal ( $n = 48$ ). Partial pack removal was most effective if conducted within the first 7 days following depredation, after which there was only a marginally significant difference between partial pack removal and no action ( $HR = 0.86, P = 0.07$ ), and no difference after 14 days ( $HR = 0.99, P = 0.93$ ). Ultimately, pack size was the best predictor of a recurrent depredation event; the probability of a depredation event recurring within 5 years increased by 7% for each animal left in the pack after the management response. However, the greater the number of wolves left in a pack, the higher the likelihood the pack met federal criteria to count as a breeding pair the following year toward population recovery goals.