Partitioning Human Impacts on Riparian Bird Distribution along the Madison and Missouri Rivers, Montana

Robert J. Fletcher, and Richard L. Hutto, Avian Science Center, Division of Biological Sciences, University of Montana, Missoula, 58912

Conservationists, managers, and land planners are faced with a formidable task of needing to balance many issues regarding the impacts of humans on natural systems. While numerous investigations have documented a variety of impacts, from over-grazing to housing development, we know little about the independent effects of human impacts on biodiversity. This is unfortunate because managers and conservationists need such information to guide difficult decisions regarding where to allocate limited resources. Riparian forest habitats in Montana illustrate this problem, where many potential stressors can affect wildlife. We estimated the relative effect of anthropogenic stressors on birds using 105 riparian forest patches across three regions along the Madison and Missouri Rivers, Montana. We partitioned the effects of grazing, invasive plant species, habitat loss and fragmentation, and development and discuss the independent effects of each potential stressor on avian species richness and the occurrence of 35 bird species. For instance, grazing intensity, invasive plant cover, and under-story vegetation were all correlated, with high grazing intensity being positively correlated with invasive species cover, both of which were negatively correlated with the amount of under-story vegetation. Much of the effects on bird distribution can be explained by nesting and foraging substrates of these species. We end by providing recommendations on riparian forest management for Montana.