Evaluating Habitat Restoration Using Bird Communities: a Spatially Explicit Approach and Application to Aquatic Systems

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Habitat restoration is one of the only alternatives for conserving biodiversity in threatened landscapes. Biologists and managers are not only faced with restoring habitat, but also with the critically important task of evaluating the potentially widespread effects of restoration. Determining the success of restoration can be complex, however, because management can have a variety of effects on plant and animal communities. Here we describe the merits of using information on bird communities collected at landscape scales to evaluate restoration success. We illustrate this approach with an example from ongoing restoration at Odell Creek, a small stream located near the Madison River, Montana. We identify the following advantages to using bird communities for evaluating restoration success: 1) systematic data can be collected easily and less expensively than for other vertebrates, because birds are the most

visible and active vertebrates; 2) information can be rapidly gathered for dozens of species across broad spatial scales; 3) collective effects of restoration can be integrated into information on bird communities, such as effects on water quality, insect abundance, vegetation, or microclimate; and 4) the identification of effective indicators is highly probable because birds vary widely in their requirements and life history strategies. Furthermore, sampling designs that allow assessment of the spatial extent and magnitude of restoration effects can easily be implemented. Our approach should help act as a springboard for initiating future restoration on private lands, improving methods of restoration, and using existing data to predict restoration potential.