

Disturbance Zones of Influence on Boreal Songbird Communities in Northern Alberta

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Understanding boreal songbird habitat requirements and responses to human disturbance is vital for predicting, assessing and mitigating the effects of development on songbirds, including listed species, in Alberta. However, limited information is available regarding the way multiple landuses might act cumulatively to affect the relative abundance of songbirds, or the species richness and diversity of songbird communities. There might be thresholds of cumulative disturbance beyond which songbirds begin to avoid an area (Villard et al. 2007), modify their behaviour (Bayne et al. 2005), or suffer reduced survival (Whitaker et al. 2008) or reproductive success (Hannah et al. 2008), with responses apparently specific to the type of disturbance (Bayne and Hobson 1997). In northern Alberta, disturbance density has increased rapidly in the past decade and likely will continue to do so in the near future (Schneider 2002). Consequently, it is important to

quantify the risk of habitat degradation and loss for wildlife, including boreal songbirds.

Songbird perception of disturbance density likely varies with disturbance type and with landscape-level composition. For example, narrow seismic lines (2 to 3 m) seem to have a lesser impact than conventional 8 m wide seismic lines (Bayne et al. 2005) and nest predation differs between landscapes fragmented by agriculture or forestry (Bayne and Hobson 1997). Drapeau et al. (2000) found that the landscape context was as important as local habitat conditions when determining variation in bird communities in areas influenced by different types of disturbance (i.e., human settlement, agriculture, pre-industrial logging activities, modern timber harvest and natural disturbance). Thus, it is useful to examine varying zones of influence (ZOI) surrounding potential bird habitats (e.g., radii of 250 m, 500 m, 1000 m) to better delineate the scale(s) at which various disturbance types and disturbance densities affect songbird population and community parameters (St. Laurent et al. 2009).

To make inferences about regional songbird habitat associations and predict responses to disturbance in northeastern Alberta, researchers often turn to data from other boreal regions of Canada or in Europe, even though species from distinct regional communities respond in unique ways to landscape change (Niemi et al. 1998). We propose an empirical investigation of

songbird habitat associations and response to disturbance in northeastern Alberta (mainly the Central Mixedwood Natural Subregion [Beckingham and Archibald 1996]) using a 10 year dataset collected from sites spread across a study area of 5.8 million hectares (ha).

Policy Issue

Biodiversity; species conservation, boreal songbirds

Knowledge Gap

Migratory bird use of disturbed habitats

Report

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