Gulf Islands National Park Reserve

Forest Songbird Monitoring

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Parkscanada.gc.ca/gulfislands

1-866-944-1744

In June 2008, Gulf Islands National Park Reserve staff began monitoring songbird populations in forest ecosystems on five of the larger islands in Gulf Islands National Park Reserve. This is part of the park reserve's long-term ecological integrity monitoring program. Songbirds are a key component of forest ecosystems in Gulf Islands National Park Reserve and have been adopted as a measure for condition monitoring, common to the three Pacific coast national park reserves. Songbird monitoring will also be an important component of management effectiveness monitoring, especially as it relates to ecosystem restoration.

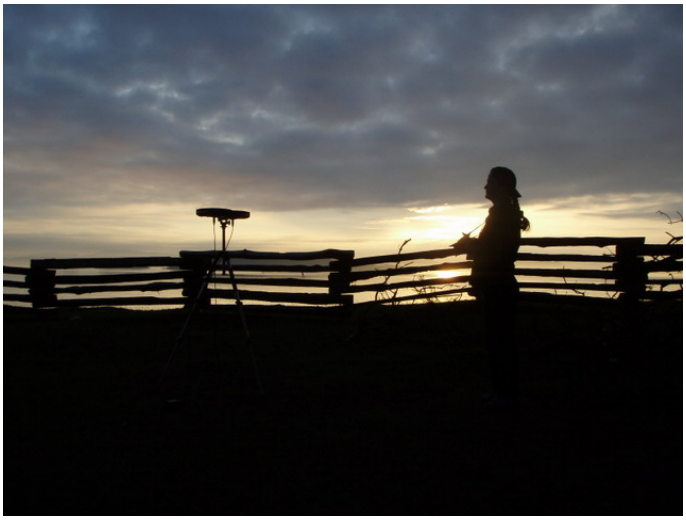

Figure 1: Songbird monitoring using acoustic recording equipment.

The primary objective of songbird monitoring is to detect trends and changes in abundance of common breeding songbirds over time as well as changes to songbird community composition. Monitoring will establish baseline abundance values, determine rates of change, and document observations of other non-target species.

The general program is designed to be robust enough to detect 30% changes in abundance over a ten-year period. However, the percent change, time period, number and distribution of samples, and the sampling frequency, can be adjusted to address other objectives.

Monitoring songbirds to assess ecological integrity is appealing because birds are readily sampled and their taxonomy and habitat associations are well known (Furness and Greenwood 1993, O'Connell et al. 2000). Bird populations, communities, behaviour and reproductive success often closely reflect the stability of an ecosystem (Furness and Greenwood 1993) and as a result, birds can serve as indicators of overall change in habitat quality (Morrison 1986) or composition. For example, a decreasing trend in bird abundance may reflect changes in habitat quality whereas a change in bird community composition may suggest a change in habitat composition. Specific cause and effect relationships will require targeted research programs.

This is the fourth year for the program in Gulf Islands with sampling occurring on North and South Pender, Saturna, Portland and Sidney Islands. During 2010, D'Arcy and Tumbo were also sampled to see how songbird communities on these smaller islands compare to larger adjacent islands.

Methods

The method being used has been adopted by a number of national parks across Canada and utilizes digital recording equipment (Figure 1) as opposed to more traditional point counts using trained observers. This technique was developed by the Canadian Wildlife Service in conjunction with Parks Canada. Where trained observers are available, they also simultaneously conduct traditional point count surveys. Recorded files are reviewed by a trained birder using special software to both listen to and view sonograms (Figure 2).

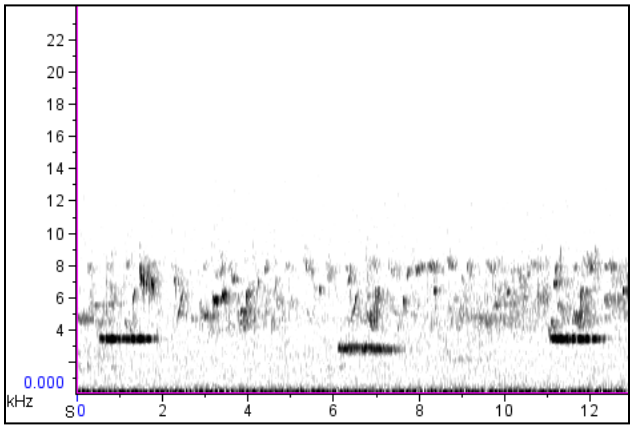

Figure 2: Sonogram for a Varied Thrush. This distinctive pattern is easily seen in recorded digital file.

Results

Monitoring shows that Gulf Islands' songbird community stands out as being unique. Results of point counts in the park reserve indicate that some of the most biologically diverse sites anywhere in the province of British Columbia exist here (DiCorrado, BC Breeding Bird Atlas, pers comm. 2009). Fifty-three different songbird species have been identified including the following ten most common species: Pacific Slope Flycatcher (PSFL), American Robin (AMRO), Song Sparrow (SOSP), Chestnut-backed Chickadee (CBCH), Red-Breasted Nuthatch (RBNU), Townsends Warbler (TOWA), Wilson's Warbler (WIWA), Orange-Crowned Warbler (OCWA), Red Crossbill (RECR), and Brown Creeper (BRCR) (Figure 3).

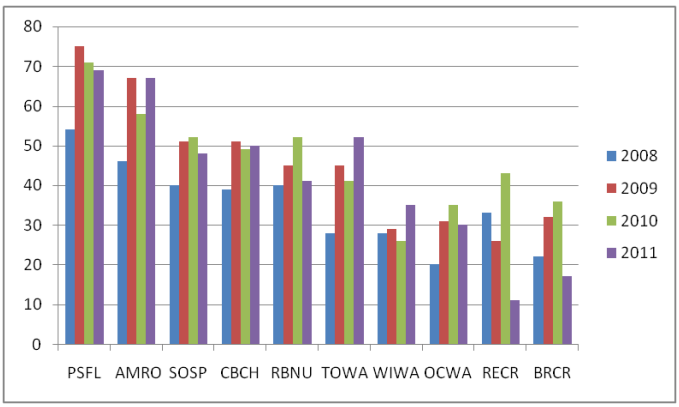

Figure 3: Abundance of ten most common forest songbirds in Gulf Islands National Park Reserve (2008-2011).

Two species, the Olive-sided Flycatcher and Band Tail Pigeon, which are federally-listed as Species of Concern have also been recorded with the Olive-sided Flycatcher occurring almost as frequently as other "common species".

Average songbird species richness ranges from 10.4 to 13.7 species per site with a park-wide average of 11.3 species and differs only slightly among the islands sampled (Figure 4).

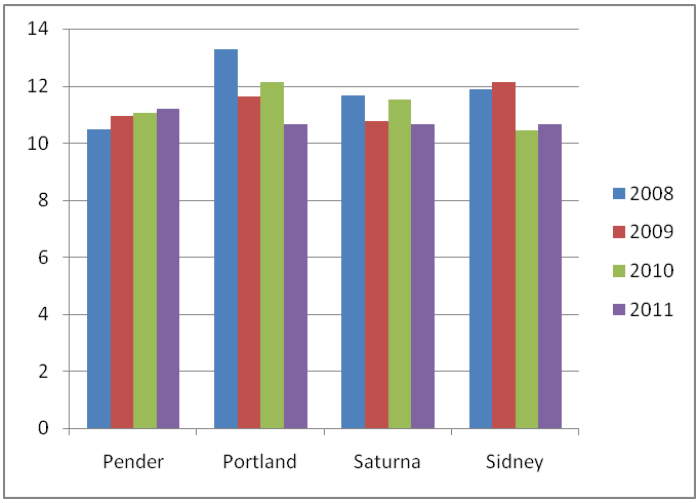

Figure 4: Songbird species richness by island.

Differences between sites and islands may be due to a number of factors including the presence or absence of deer which have the effect of reducing ground and shrub cover on some islands and have been shown to strongly influence songbird community composition elsewhere. As areas of the park reserve are restored, songbirds may be used a measure of restoration success.

Next Steps

Gulf Islands National Park Reserve is continuing to develop an Ecological Integrity Monitoring Program that will provide long-term information about the various ecosystems found in the park reserve. Data collected over the first three years of the songbird monitoring program will be analyzed and baseline conditions described. Future sampling results will be compared to these baseline conditions to determine if songbird abundance and community composition are changing over time and what factors may be responsible for these changes.