Olive-sided Flycatcher [*Contopus cooperi*]

Distribution & Habitat Associations in Alberta

The Olive-sided Flycatcher is a unique species with its incredibly long migration routes, its diet of flying insects and its famous call of a "quick, three beers." The species can be found in many parts of Alberta, despite significant declines in the North American population. In an effort to better understand the detailed status of the Olive-sided Flycatcher and other individual bird species in Alberta, the Alberta Biodiversity Monitoring Institute (ABMI) has partnered with the Boreal Avian Modelling (BAM) Project. The purpose of this partnership is to develop a deeper understanding of how the management of wildlife habitat and human footprint* affect birds in the boreal forests of Alberta. Results are presented here for the Olive-sided Flycatcher.

[SUMMARY]

The Olive-sided Flycatcher was most common in the Rocky Mountain Natural Region. General habitat associations found in our analyses corresponded well to existing expectations based on this species' natural history. Abundance of this species was highest in shrubby habitats, and along the margins of wetlands and open water. Olive-sided Flycatcher abundance peaked in landscapes with intermediate levels of forestry footprint, and consistently declined with increasing agriculture and urban-industrial footprint.

***The ABMI defines "human footprint" as "the visible conversion of native ecosystems by humans to support temporary or permanent residential, recreational, or industrial land use." Vegetation recovery in human footprints has not been incorporated in the present analyses.**

Photo credit: Ted Ardley

Alberta Biodiversity Monitoring Institute

The Olive-sided Flycatcher has been listed as "Threatened" by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) since November 2007.

INTRODUCTION

Wintering in Panama and the northern Andes Mountains, the Olive-sided Flycatcher undergoes one of the longest migrations of all boreal landbirds in Alberta. Its preferred breeding habitat is generally viewed to be coniferous forest edges close to natural openings such as rivers, wetlands, and young burns [1]. But the Olive-sided Flycatcher will use young post-harvest cutblocks particularly when there are residual trees and snags remaining. In Alberta's boreal forest, wooded riparian areas are thought to be used for breeding by the Olive-sided Flycatcher[1]. As the Olive-sided Flycatcher feeds almost exclusively on flying insects, nesting territories are characterized by having trees and snags which provide perching and singing posts [1,2].

OFFICIAL STATUS

The Olive-Sided Flycatcher is listed as "May be at risk" by Alberta ESRD, Threatened by COSEWIC and under SARA legislation, and Near Threatened by IUCN (Red List ver 3.1).

RESULTS SUMMARY

The compiled data sets of the ABMI, BAM, and Breeding Bird Survey (BBS) included 19,659 point-count locations in Alberta. The Olive-sided Flycatcher was detected at 541 or 2.8% of surveyed locations.

The Olive-sided Flycatcher occurred most often in the Rocky Mountains, such as in Jasper National Park (pictured below.)

SPECIES OCCURRENCE

Olive-sided Flycatcher occurred most often in the Rocky Mountains (8.3% occurrence), Foothills (3.4% occurrence), and Boreal (2.9% occurrence) Natural Regions. It occurred infrequently in the Parkland Natural Region (0.8% occurrence), and was absent from the Grassland Natural Region. Detections were highest (>5%) in Alberta's Athabasca Plain, Montane, Subalpine, and Upper Boreal Plains Natural Subregions. Intermediate levels (2-4% occurrence) of detections were observed in the following Natural Subregions: Central Mixedwood, Lower Boreal Highlands, Lower Foothills, Upper Foothills, Northern Mixedwood, Peace River Parkland. BAM data provided more than half of the detections which were concentrated in the Central Mixedwood and Upper Foothills Subregions. The ABMI data covered the remainder of the province.

Habitat Associations

General habitat associations of the Olive-sided Flycatcher in Alberta corresponded well with existing knowledge of the species' natural history. Olive-sided Flycatcher relative abundance (hereafter, abundance) was highest in shrubby habitats and along the margins of wetlands and open water (Figure 1).

Abundance was highest in young pine and upland spruce forest, followed by young mixedwood and deciduous stands although it is moderate in old upland spruce; abundance generally declined with forest age (Figure 2). Olive-sided Flycatcher abundance was consistently low in lowland spruce forests regardless of stand age.

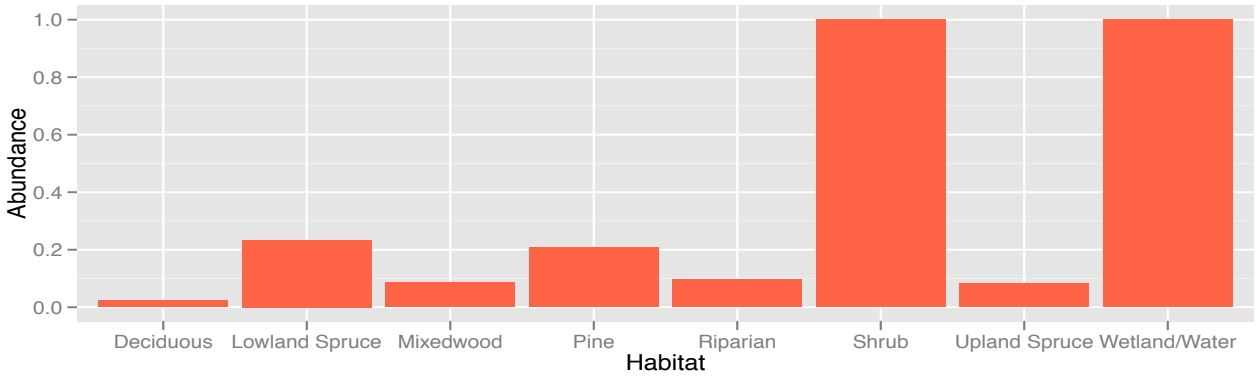

Figure 1. Abundance of Olive-sided Flycatcher in eight major habitat types. Abundance was measured as number of individuals per hectare standardized to a scale of 0 to 1. Data source: ABMI, BAM, BBS, Alberta Vegetation Inventory, Grassland Vegetation Inventory, and the ABMI's provincial Human Footprint Inventory version 2007.

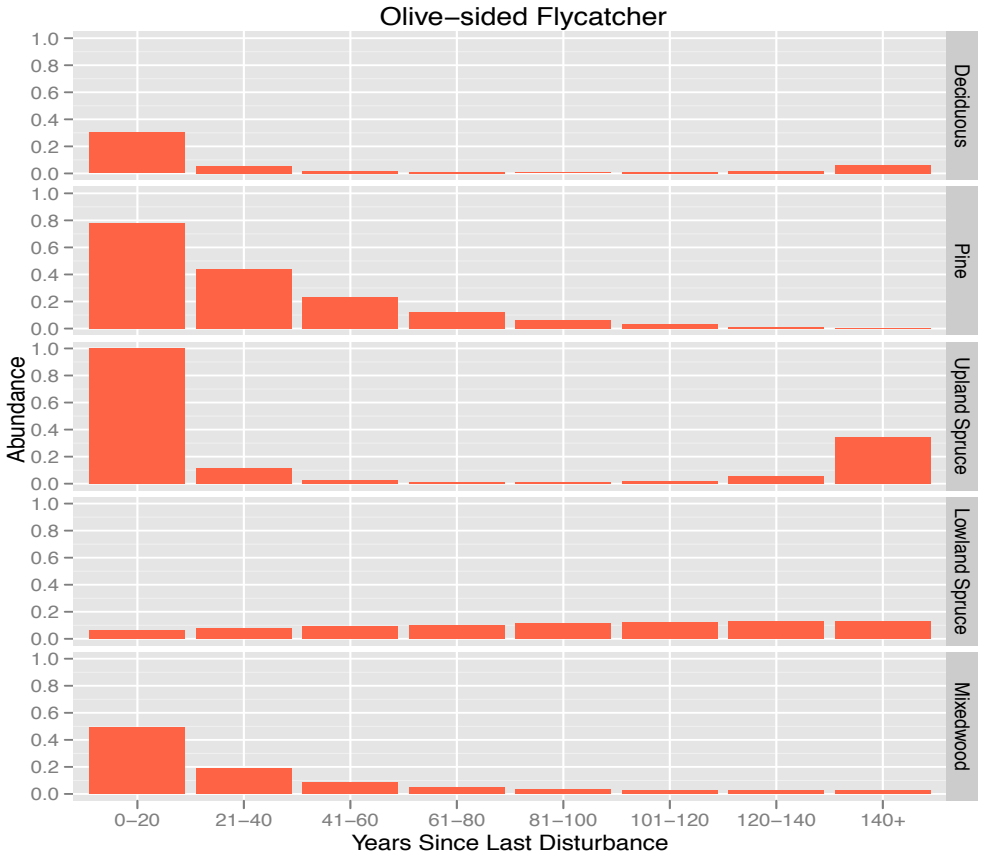

Figure 2. Abundance of Olive-sided Flycatcher by forest type and age. Abundance was measured as number of individuals per hectare standardized to a scale of 0 to 1. Data source: The ABMI, BAM, BBS, Alberta Vegetation Inventory, Grassland Vegetation Inventory, and the ABMI's provincial Human Footprint Inventory version 2007.

Response to Human Footprint

Abundance of the Olive-sided Flycatcher (hereafter, abundance) decreased with increasing amount of agricultural cultivation (annual crop and tame pasture) and with increasing urban and industrial footprint. Olive-sided Flycatcher abundance peaked in landscapes with intermediate levels of forestry footprint (Figure 3).

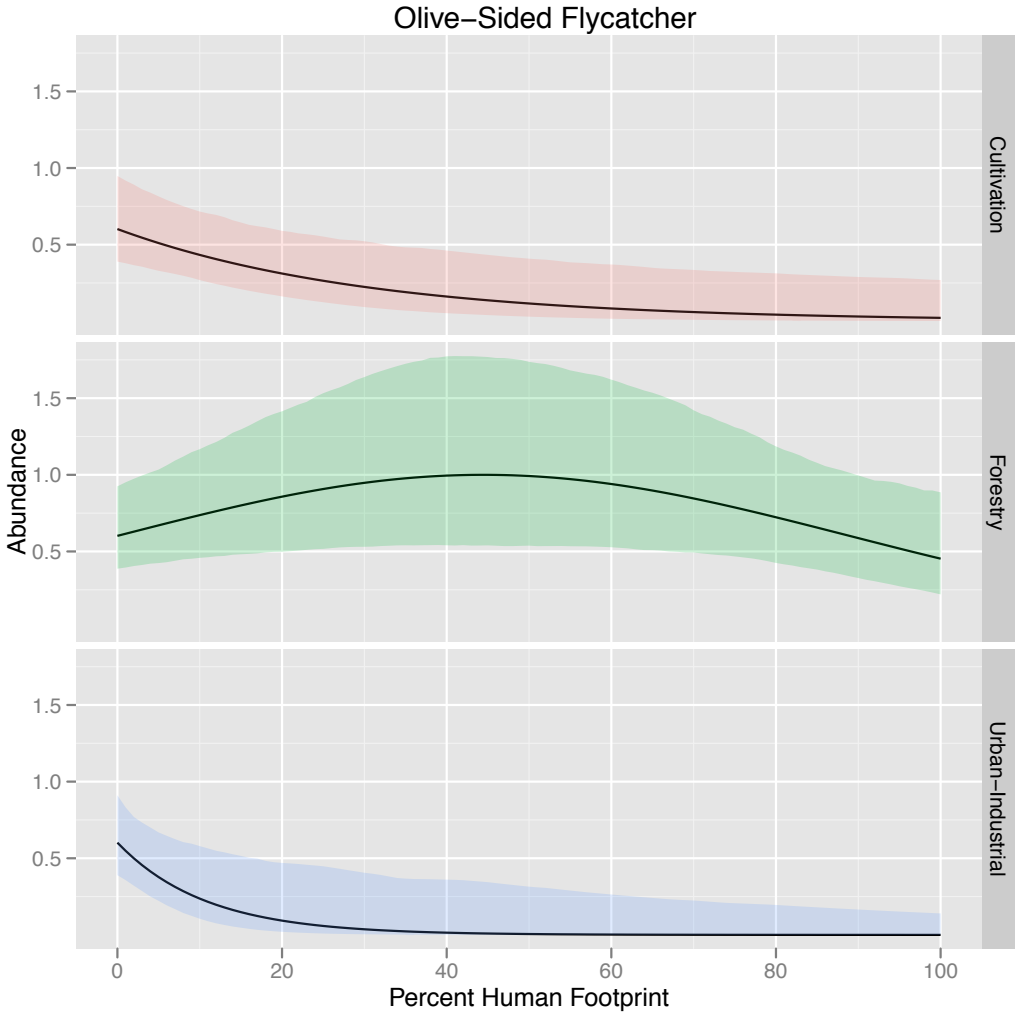

Figure 3. Abundance of the Olive-sided Flycatcher as a function of percent human footprint. Abundance was measured as number of individuals per hectare standardized to a scale of 0 to 1. Shaded areas represent 90% confidence intervals. Data source: the ABMI, the ABMI's provincial Human Footprint/Habitat Inventory version (2007) clipped to 150m radius circles around each point-count.

Mapping the Provincial Habitat Suitability of the Olive-sided Flycatcher

Reference Habitat Suitability

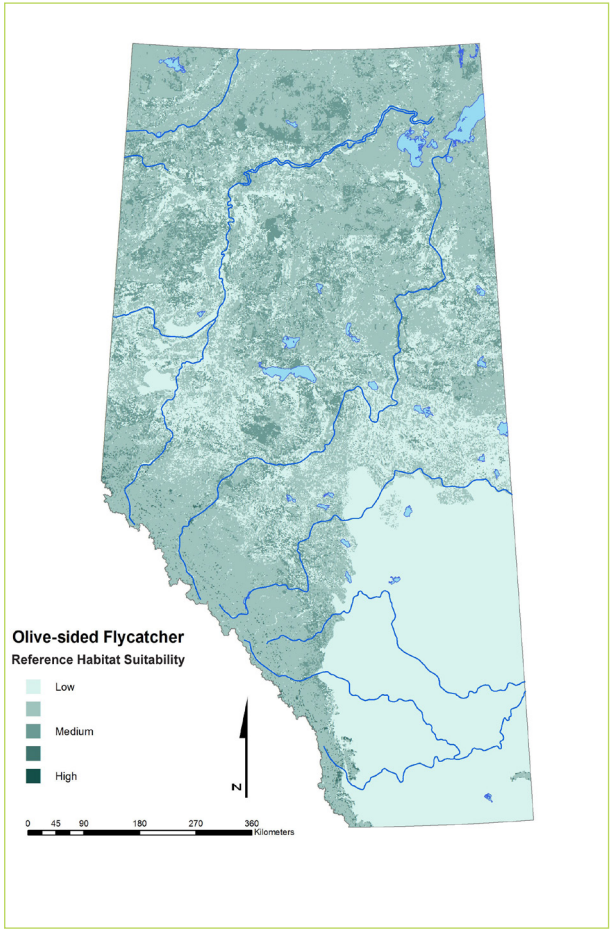

Figure 4a. Predicted provincial reference conditions for the Olive-sided Flycatcher calculated by statistically controlling (removing) human footprint effects. Mean habitat suitability under reference conditions was 0.234. Data source: the ABMI's field data, the ABMI's provincial Human Footprint/ Habitat Inventory version (2007) and the ABMI's wall-to-wall landcover (vegetation) map (circa 2000) Predictions are made to a scale of provincial quarter sections (Alberta Township System).

Current Habitat Suitability

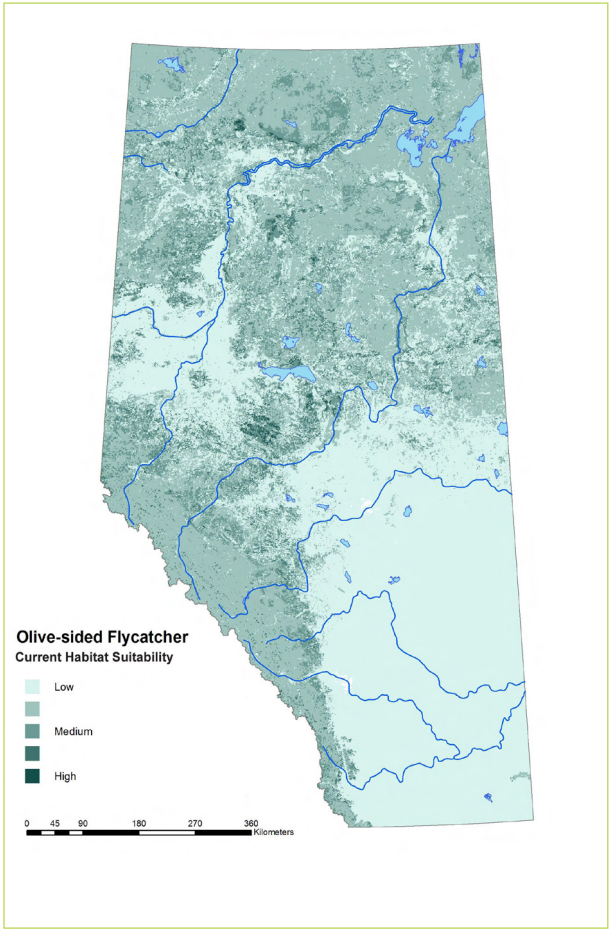

Figure 4b. Predicted provincial habitat suitability for the Olive-sided Flycatcher (circa 2007). Mean habitat suitability under current conditions was 0.217. Data source: The ABMI's field data, the ABMI's provincial Human Footprint/ Habitat Inventory version (2007) and the ABMI's wall-to-wall landcover (vegetation) map (circa 2000). Predictions are made to a scale of provincial quarter sections (Alberta Township System).

Change in Habitat Suitability

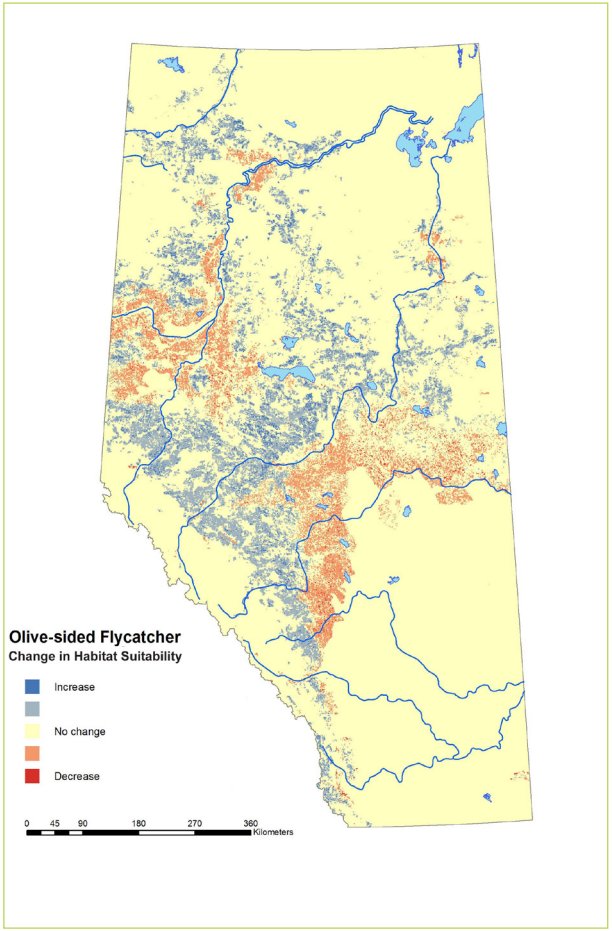

Figure 4c. Difference between reference conditions (Figure 4a) and current habitat suitability (Figure 4b) for the Olive-sided Flycatcher in Alberta (circa 2007). Data source: the ABMI's field data, the ABMI's provincial Human Footprint/Habitat Inventory version (2007) and the ABMI's wall-to-wall landcover (vegetation) map (circa 2000). The map is made to a scale of provincial quarter sections (Alberta Township System).

Mapping the Provincial Habitat Suitability of the Olive-sided Flycatcher

CHANGE IN HABITAT SUITABILITY

Using the statistical relationships between human footprint, habitat, and Olive-sided Flycatchers, it is possible to create maps that empirically predict the habitat suitability of this species in every quarter section of the province (Figures 4a, 4b, and 4c).

Mean habitat suitability across the province has decreased by 7.3% from reference (0.234) to current (0.217) conditions.

Provincially, Olive-sided Flycatcher habitat suitability was predicted to be lowest in regions where agriculture, urbanization, and energy-related footprint are highest. Higher habitat suitability were predicted in areas with intermediate levels of forestry footprint.

POPULATION TRENDS

According to BirdLife International's Red List assessment (www.iucnredlist.org), the species has undergone a moderately rapid decline in North America. However, the population decline in Alberta was not significant based on Breeding Bird Survey (BBS) trend data.[2] The Olive-sided Flycatcher has shown a widespread and consistent population decline across much of Canada and the United States (4%/year from 1968-2006).[3] Currently, there is not enough temporal data to calculate population trend for the Olive-sided Flycatcher in Alberta.

Photo credit: Royal Alberta Museum

REFERENCES

1. Altman, B., and R. Sallabanks. 2000. Olive-sided Flycatcher (Contopus cooperi), The Birds of North America Online. A. Poole, Ed. Ithaca: Cornell Laboratory of Ornithology; Retrieved from The Birds of North America Online database: **http://bna.birds.cornell.edu/bna/species/502**.

2. COSEWIC. 2007. COSEWIC assessment and status report on the Olive-sided Flycatcher Contopus cooperi in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 25 pp. (**www.sararegistry.gc.ca/status/status_e.cfm**)

3. For more information on the Boreal Avian Modelling project and the North American Breeding Bird Survey please see **www.borealbirds.ca** and **www.pwrc.usgs.gov/BBS,** respectively.

The ABMI & Next Steps

THE ABMI

The Alberta Biodiversity Monitoring Institute is an independent non-profit organization that operates a long-term biodiversity monitoring program for Alberta. The ABMI monitors a network of 1656 terrestrial and wetland sites evenly spaced across the province, and also develops remote sensing products that provide data on land cover and land use at a province-wide scale and for a rectangular plots centered around each of the 1656 monitoring sites. The ABMI measures and reports on the state of biodiversity, habitat, and human footprint across the province using scientifically credible indicators of environmental health. Species data collected at the ABMI's sites includes:

- Terrestrial sites: breeding birds, trees, and soil samples (soil mites), vascular plants, mosses, and lichens
- Winter tracking sites: mammal tracking
- Wetland sites: vascular plants, vertebrate sightings, and aquatic invertebrates

The ABMI is an independent and not-for-profit organization and is Canada's only province-wide monitoring program of this scale.

The ABMI spearheads projects in

- Climate change adaptation
- Ecosystem services assessment
- Regional biodiversity planning and management (rare plant and animal monitoring design, Woodland Caribou conservation strategies

ABMI data and information is freely available and is used in forest and oil sands stewardship reporting, land-use planning, establishing regional goals and baseline data, among other areas. Findings and reports are published on our website (**www.abmi.ca**).

NEXT STEPS

The ABMI is a provincial biodiversity monitoring program designed specifically to track trends in landbird species including the Olive-sided Flycatcher. Coupled with programs like the Boreal Avian Modelling project, the ABMI's trend monitoring program is a powerful tool that directly supports land use planning, cumulative effects management, and species at risk management. The ABMI is designed to provide scientifically credible biodiversity trend information for hundreds of species across Alberta. As the ABMI's monitoring data continues to mature the following is expected:

1. Provincial trend data for greater than 100 landbird species including the Olive-sided Flycatcher

2. Deeper scientific understanding of the relationship between landbird species and their habitats

3. Deeper scientific understanding of how current and future land use activities affect habitat and the species themselves

4. Comparable knowledge for hundreds of other native species including winter-active mammals, plants, moss, lichens, and wetlands