

The distribution and habitat preferences of the "Western Flycatcher" in Alberta

Bryan K. Kulba and W. Bruce McGillivray
Provincial Museum of Alberta



Please cite this document as:

Kulba, B.K., and W.B. McGillivray. 2000. The distribution and habitat preferences of the "Western Flycatcher" in Alberta. [WWW document, 365 kb]. URL <http://www.pma.edmonton.ab.ca/vpub/wefl/index.htm>



THE PROVINCIAL MUSEUM OF ALBERTA

©2000 The Provincial Museum of Alberta

The distribution and habitat preferences of the “Western Flycatcher” in Alberta

Bryan K. Kulba and W. Bruce McGillivray

Provincial Museum of Alberta

Introduction

The Western Flycatcher complex is part of the *Empidonax* genus, in the family Tyrannidae. The American Ornithologists’ Union (AOU 1989) split the complex into two species, the Cordilleran Flycatcher (*Empidonax occidentalis*) and the Pacific-slope Flycatcher (*E. difficilis*). Differences in vocalization, size, colour and gene frequencies were the basis for this split (Johnson 1980, Johnson and Marten 1988). Johnson and Marten (1988) proposed a split between the lineage leading to *E. d. hellmayri* (Cordilleran) and *E. d. difficilis* (Pacific-slope) at about 250,000 years before present. The two species are visually identical but Johnson (1994) states that they can be distinguished in the field by the advertising song of the males. He describes the pitch changes in the last syllable of the Cordilleran Flycatcher song as a “high-low” sequence of notes while the Pacific-slope shows the reverse (low-high) pattern (Johnson 1994).

The Western Flycatcher complex breeds from southwestern Alaska south to southwestern California and from southwestern Alberta, through Wyoming and South Dakota to Arizona and northern California (DeGraaf and Rappole 1995). The distribution of the Cordilleran and Pacific-slope forms based on Johnson (1980) is shown in Figure 1. Subsequent research has demonstrated the presence of the Western Flycatcher complex throughout southern British Columbia (Campbell *et al.* 1997, Sauer *et al.* 1997, Cannings and Hunn, unpubl.). The Cascade Mountains and Sierra Nevada Mountains separate the coastal Pacific-slope from the interior Cordilleran forms. Both species winter in northern Mexico.

In Alberta, the “Western Flycatcher” is closely associated with slopes, cliffs and canyons especially near creeks and rivers (McGillivray and Semenchuk 1998, Doug Leighton, pers. comm., Fig. 2). Sites with these features tend to be moist and shadier than the surrounding area (Campbell *et al.* 1997). Johnson (1994) comments that “*E. difficilis* (the “Western Flycatcher”) is invariably associated with water courses and thus openings in the timber ... moist canyon

bottoms offer the airways under the canopy ... for foraging and the sites for nests along mossy stream banks ... coolness, shade and nest-sites are indispensable requisites whenever continental populations nest successfully." Like all flycatchers, the "Western" eats mainly flying invertebrates (Bent 1942).



Figure 1. Distribution of Western Flycatcher complex (adapted from Johnson 1980)



Figure 2. "Western Flycatcher" site along the Livingstone River.

Johnson (1980), Johnson and Marten (1988) and McGillivray and Semenchuk (1998) assert that the Cordilleran, not the Pacific-slope is the form found in Alberta. By contrast, the recent *National Geographic Field Guide to the Birds of North America* (Dickinson 1999) indicates the Pacific-slope Flycatcher as the Alberta form. Support for the presence of the Pacific-slope Flycatcher in Alberta is based on a 1993 manuscript (Richard Cannings and Eugene Hunn unpubl.) which argues that vocalizations of “Western Flycatchers” in the interior of British Columbia and the Alberta Rocky Mountains identify these birds as Pacific-slope forms.

Due to the subtle differences between the Cordilleran and Pacific-slope Flycatchers and the uncertainty as to which species breeds in Alberta, we will refer to all birds within the province as “Western Flycatchers”. When referring to accounts of species outside Alberta, we will use the name the author uses (Western Flycatcher, Cordilleran Flycatcher, and Pacific-slope Flycatcher).

Historically *Empidonax* flycatchers have been a challenge to document and study. The similarity in plumage within the genus makes identification difficult. The specific and often uncommon habitat preferred by the “Western Flycatcher” in Alberta presents some special problems, too. Riparian habitat is challenging to census because access by road or trail is often limited and moving water is noisy making detection of singing males difficult. Finally, this species can easily be missed when areas are censused because its arrival on breeding territories may be later than the date of most spring surveys. In the southern interior of British Columbia, the Western Flycatcher arrives in early June (Campbell *et al.* 1997). Arrival in Alberta is at least this late (Pinel *et al.* 1993, Leighton, pers. comm.), particularly at higher elevations.

There are relatively few documented records of “Western Flycatchers” in Alberta despite considerable anecdotal evidence. The first record for the province was in 1954 (Salt and Salt 1976). Holroyd and Van Tighem (1983) describe the Western Flycatcher as a rare summer resident with less than 10 records for Banff and Jasper National Parks. *The Atlas of Breeding Birds of Alberta* (Semenchuk 1992) showed only nine confirmed breeding records for its five year atlasing period. *The Status of Alberta Wildlife* (Alberta Wildlife Management Division 1996) listed the Cordilleran Flycatcher as "Yellow B" indicating “...concerns related to naturally low populations, limited provincial

distributions or demographic/life history features that make them vulnerable to human-related changes to the environment.”

The low number of confirmed records for the “Western Flycatcher” may be more a statement of the challenge of censusing this bird than its true rarity. We undertook a survey of the mountains and foothills in Alberta that provide potentially suitable habitat for these species. We had two objectives. First we wanted to determine the true range of this species in the province. Second, we wanted to quantify the habitat of the flycatcher to assess the risk that habitat loss poses for the species.

Materials and Methods

Study Area

To determine the census area, we reviewed previous records of “Western Flycatchers” within Alberta from the Provincial Museum of Alberta (PMA) collection, the Federation of Alberta Naturalists (FAN) Birdlist database, which includes the records from the Breeding Bird Atlas project and Pinel *et al.* (1993). As a result, we established a census route north from Waterton Lakes National Park to Jasper National Park and east from the British Columbia border to Cadomin in the north and Sundre in the south. The census area encompassed all the documented sightings of the “Western Flycatcher” in Alberta. This was a large area to cover in one field season, consequently, census routes were restricted to roads, major trails and surrounding areas a short hike from road access. Without doubt, many suitable areas for this species exist away from roads in the foothills and mountains.

The Rocky Mountains and Foothills Regions are biophysical units of Alberta (Alberta Natural Heritage Information Centre 1999). The Rocky Mountains form the western boundary of southern Alberta and range from 1000 m to 3700 m. This region is dominated by primarily coniferous forests of various species of pine (*Pinus* spp.) and spruce (*Picea* spp.). The Foothills are a transition region between the Rocky Mountains and the Boreal Forest, Aspen Parkland and Grassland regions to the east. Forests tend to be mixed deciduous and coniferous with species composition dependent on elevation.

Census

Due to the short period of time “Western Flycatchers” are on territories singing (Cannings pers. comm.), we censused in May and June and returned to each site later in the season to assess habitat.

Censusing was conducted from 4:00 am to 1:00 pm between 25 May and 4 July 1999. The “Western Flycatcher” sings vigorously early in the breeding season and early in the day (Cannings, pers. comm.). Because spring arrival dates in Alberta are not well known and the preferred range of this species easily affected by inclement weather, we were not comfortable assuming that the absence of the species in late May or early June meant that it does not breed in the censused area. To minimize the risk of missing late arrivals, we began censusing in extreme southwestern Alberta and worked north. A return trip to Waterton Lakes National Park in June allowed us to confirm the validity of earlier observations.

Potential sites were selected on the basis of previous records, and habitats that contained the features known to attract “Western Flycatchers.” Upon arrival at a site, we began taped playback of song, unless there was a male already singing. Playback was performed with intervals of one minute playing and one minute of silence for about 10 minutes. It was necessary to spend the minimum of 10 minutes because the high level of background noise from streams in the habitat makes playback and hearing the birds difficult. Most sites were located along fast-moving streams and sometimes near rapids and waterfalls. Once a bird responded to the playback, we would obtain the latitude, longitude and elevation of the site using a Garmin 12XL GPS unit. The location of the site, other bird species detected and a brief habitat description were also noted. Each site was then photographed.

Habitat Measurement

Categorical Habitat Assessment

Once a singing male was determined to be defending a territory, we recorded a variety of categorical and quantitative variables. Water on the site was classed as either: (1) standing water, (2) slow-moving stream or river or (3) fast-

moving stream or river. We measured the stream and riparian zone (first major break in slope) to the nearest metre using a Bushnell Yardage Pro 800 range finder or by sight, if the stream was small.

To determine if the habitat surrounding the site was distinctive, in each of the cardinal directions, we classified it into either: (1) coniferous forest, (2) deciduous forest, (3) mixed forest (coniferous dominated), (4) mixed forest (deciduous dominated), (5) riparian shrubs, (6) stream/river, (7) moss or grass, or (8) bare.

A slope or cliff was characteristic of all “Western Flycatcher” sites. We used the Bushnell range finder to determine the height of the cliff and recorded the direction it faced. We then used a Suunto clinometer to get an approximate slope angle. Depending on the slope of the incline, we classed it into either: (1) slope (30°), (2) steep incline (30-60°), (3) steep incline with cliff aspects (30-60° with some areas > 60°) or (4) cliff (> 60°). Because slopes are known nesting sites for Western Flycatchers, we recorded the dominant vegetation for the top and bottom of the slope. Finally, the type and density of vegetation on the slope was noted.

Quantitative Assessment

Simply recording vegetation categories (e.g., coniferous forest) tells us little about the maturity of the surrounding vegetation or its density. To provide a measure of vegetation maturity, we counted the number, size (see Table 1) and species of trees in a 10 m-radius circle in the riparian or top-slope habitat that was frequented by the birds. The centre of the circle was picked at random within the riparian area.

TABLE 1. Tree size categories

	dbh (cm)
Size 1	< 3
Size 2	3-10
Size 3	11-20
Size 4	21-30
Size 5	> 30

Data Analysis

Data from the field sheets were entered into a computer and assessed univariately and graphically. We performed the analyses using Microsoft Excel 97 and SPSS 7.5. When variables were approximately normally distributed, parametric measures of central tendency and spread were used.

Results

In the 1999 field season, we located 41 sites where "Western Flycatchers" had established territories (Fig. 3). In Alberta, the Western Flycatcher breeds within the Rocky Mountains and the Foothills ecoregions. From our findings, its range in Alberta extends from Waterton Lakes National Park to Jasper National Park. It continues eastward beyond Cadomin in the north and Turner Valley in the south. It is most common north of the Highwood Pass and south of Nordegg. Of these sites, 37% were found within parks and protected areas. We performed the categorical habitat assessment on 36 of the 41 sites and the quantitative assessment on 30 of the 41.

The elevations of the sites ranged from 1153-1800 m. The mean elevation was 1533 m. Forty of the 41 sites had water as a component of the habitat. Except for one of these, the water body was a river or a stream (Fig. 4). The streams were often small but fast moving (Table 2). The riparian area averaged 22.8 m wide.

TABLE 2. Mean width of stream and riparian area.

	Mean (m)	Standard deviation
Stream	5.7	5.3
Riparian area	22.8	16.6

Virtually all of the sites were surrounded by forest. Beyond the riparian area, the sites were usually predominantly mature Engelmann Spruce forest (*Picea engelmannii*), with varying amounts of Lodgepole pine (*Pinus contorta*) (Fig. 5). Less than 2% of the sites had an "open" measurement for surrounding vegetation (see Table 3).

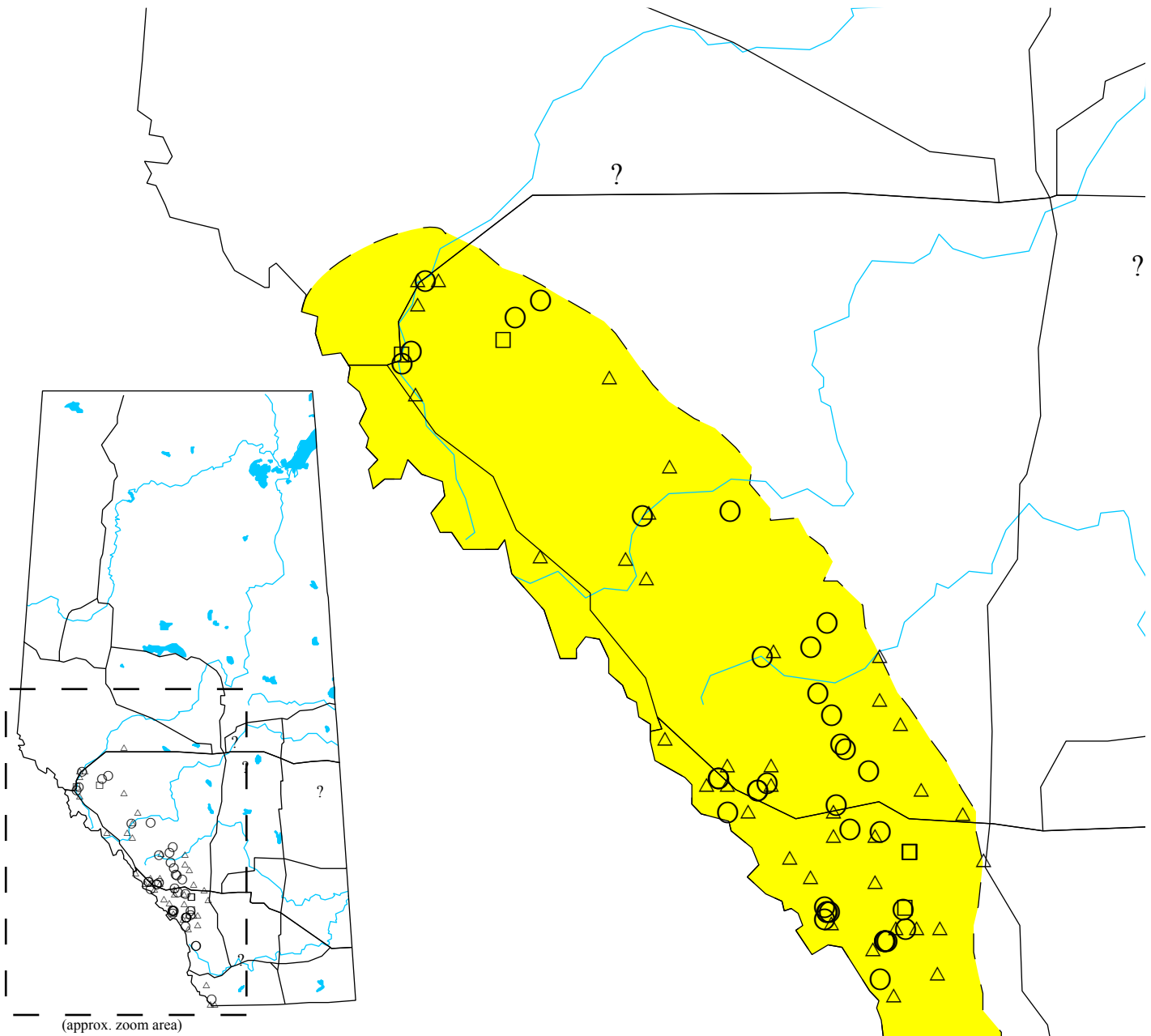


Figure 3. The "Western" Flycatcher in Alberta

- Range of the "Western" Flycatcher in Alberta
 - 1999 Kulba and McGillivray Records
 - Federation of Alberta Naturalists' Records
 - Provincial Museum of Alberta Records
 - ? Undocumented extralimital Records
 - Alberta boundary
 - Major Rivers
 - Major Roads
 - Major Lakes
- ©2000 The Provincial Museum of Alberta

0 100 km
Approximate scale



Figure 4. "Western Flycatcher" site along Bluerock Trail near Sheep River.



Figure 5. "Western Flycatcher" site along the Forestry Trunk Road north of Waiparous.

A north-facing slope was the best predictor of Western Flycatcher presence (Fig. 6). Ninety-two percent of the sites had either a cliff or an incline with cliff-like aspects to it. North-facing cliffs were predominant (Table 4). The median of the slope heights was 21 m (range=5 m - 95 m, N=36) (Fig. 7). Slope angle ranged from 30°-90° with an average of 64°. The coefficient of variation is 0.26 indicating a relatively low spread of angle values around the mean.

TABLE 3. Habitat type¹ surrounding the “Western Flycatcher” sites.

	number	Percent
Coniferous forest	67	46.5
Riparian shrubs	19	13.2
Cliff	16	11.1
Stream/river	15	10.4
Mixed coniferous forest	12	8.3
Mixed deciduous forest	7	4.9
Deciduous forest	4	2.8
Moss, grass	2	1.4
Open	2	1.4

¹Each site has four possible bordering habitat types, one in each of the four cardinal directions.



Figure 6. “Western Flycatcher” sites on the Livingstone River.

TABLE 4. Direction of the predominant slope/cliff faces in “Western Flycatcher” sites.

	Number	Percent
North	30	83.3
South	2	6.8
East	3	8.3
West	1	2.8

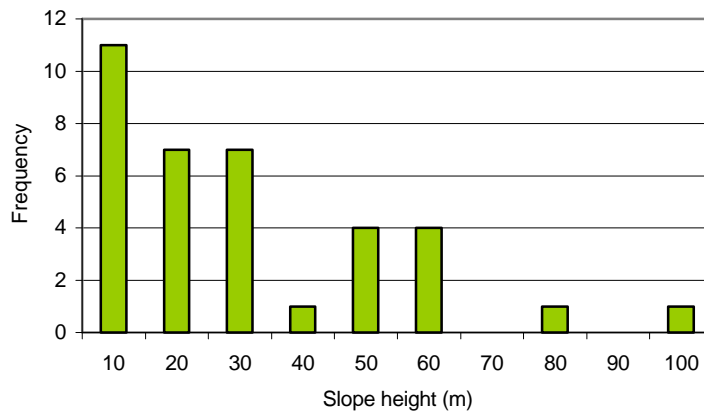


Figure 7. Frequency of slope heights in the territories of "Western Flycatchers."

The slope had varying vegetation depending on the composition of the substrate and severity of the incline. Unstable slopes were lightly vegetated but rocky cliff faces supported spruce, pine, juniper and some deciduous shrubs in sheltered areas. Often, the cliffs were bordered by unstable slide areas. Over 40% of the slopes had “moderate” vegetation while 30% had little and 30% had dense vegetation.

The slope could be interpreted as a transition between riparian and coniferous areas. The vegetation on top of the slope was invariably coniferous and similar to the regional vegetation.

Many of the slopes descended straight to the water but most had some shoreline or beach area with vegetation between the slope and the water (Table 5). This vegetation was different from that on and above the slope and the surrounding area. Nearly 40% of the vegetation below the slope was deciduous bushes and shrubs, primarily alder (*Alnus* spp.) and willow (*Salix* spp.). Large numbers of Balsam Poplar stands could be found adjacent to the streams opposite the cliffs.

TABLE 5. Dominant habitat type below the slope/cliff.

	Frequency	Percent
Straight to Water	11	30.6
Alder	9	25.0
Spruce	9	25.0
Willow	4	11.1
Balsam Poplar	1	2.8
Pine	1	2.8
Fir	1	2.8

Conifers were the most common trees counted in the 10 m radius transects, followed by willows and aspens (Table 6). The transects showed the sites tended towards larger, coniferous trees, with spruces 10-30 cm dbh (diameter at breast height) being the most common (Table 7). Over 80% of the sites had either size class 3 or 4 spruces. The abundance of both conifers (surrounding vegetation) and deciduous trees and shrubs (riparian vegetation) within the transects indicates a sharp transition between the riparian and surrounding areas (Table 8). With respect to the combined species, size class 3 trees (11-20 cm dbh or 62-124 cm circumference) predominated indicating a relatively dense mature forest (Fig. 8).

TABLE 6. Average number of trees (or stems) of different taxa per site.

Tree type	Mean (\pm Standard Error)
Spruce	28.9 \pm 6.3
Fir	12.9 \pm 5.8
Pine	9.9 \pm 4.1
Willow	8.0 \pm 4.5
Aspen	4.9 \pm 2.0
Balsam Poplar	2.5 \pm 1.5
Cottonwood	1.1 \pm 0.8
Alder	0.8 \pm 0.7
Other Shrubs	0.2 \pm 0.1
Dead	1.2 \pm 0.3

TABLE 7. Mean number of trees (or stems) per site by taxa and size class.

Conifers					Shrubs				
		Size Category	Mean	Standard Deviation			Size Category	Mean	Standard Deviation
Conifers	Spruce	1	4.8	8.9	Shrubs	Willow	1	2.7	9.9
		2	5.8	12.3			2	3	11
		3	8.6	11.5			3	2.5	11.2
		4	7.9	11.4			4	0	0
		5	1.8	2.6			5	0	0
	Pine	1	0.9	3.8	Alder	1	0.3	1.1	
		2	1.8	4.9		2	0.5	2.4	
		3	4.1	10.9		3	0	0.2	
		4	2.7	5.9		4	0	0	
		5	0.5	1.5		5	0	0	
	Fir	1	0.9	2.7	Other Shrubs	1	0.2	0.8	
		2	2.9	8.5		2	0	0	
		3	7.9	22.3		3	0	0	
		4	1.5	3.5		4	0	0	
		5	0.2	0.6		5	0	0	
Deciduous					Other				
Aspen	1	0.9	3.9	Dead	1	0.2	0.6		
	2	1.3	3		2	0.3	0.7		
	3	1.2	2.4		3	0.5	1		
	4	1.3	3.2		4	0.1	0.4		
	5	0.3	1.5		5	0.1	0.3		
Balsam Poplar	1	0.5	1.7						
	2	1.3	4.4						
	3	0.4	1.9						
	4	0.1	0.4						
	5	0.2	0.9						
Cottonwood	1	0.1	0.4						
	2	0.3	1.3						
	3	0.4	1.7						
	4	0.2	0.8						
	5	0.2	0.7						

TABLE 8. Mean number of trees per transect

Tree Type	Size Category	Mean	Standard Deviation
Conifers	1	6.6	10.6
	2	10.4	19.2
	3	20.3	26.1
	4	11.9	14.8
	5	2.5	3.1
Deciduous	1	1.4	4.1
	2	2.9	5.5
	3	2.0	4.0
	4	1.6	3.6
	5	0.7	2.2
Shrubs	1	3.2	10.1
	2	3.5	11.2
	3	2.4	11.1
	4	0.0	0.0
	5	0.0	0.0
Dead	1	0.2	0.6
	2	0.3	0.7
	3	0.5	1.0
	4	0.1	0.4
	5	0.1	0.3

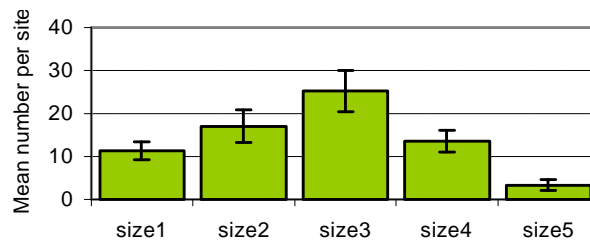


Figure 8. Distribution of tree sizes counted in 10 m radius transects in "Western Flycatcher" sites. Error bars indicated standard error.

Discussion

The habitat features that the “Western Flycatcher” prefers are distinctive among Alberta birds. A shady spot, with a slope or cliff near water was common to all sites. The bird chose a deciduous riparian oasis in the middle of homogenous, mature conifers. The slope coupled with the stream made the immediate riparian area more open than the surrounding conifers. The swatch of riparian, deciduous habitat provides an open area for foraging and display. The open space inherent in this area would reduce signal degradation of song compared to the conifer forest surrounding it. The cliff provides potential sheltered nesting areas. We did note, however that the “Western Flycatchers” were using the surrounding conifers as well as the deciduous, riparian area. When we began playback on many sites, we found that the birds would approach through the conifers, often from upslope. The coniferous forest is part of the bird’s territory and may provide nesting materials, shelter, foraging opportunities or access to sunlight and heat.

The noise level of the stream also presented some problems for detection. The birds were often slow to respond to playback. At many sites, it took as long as 10 minutes to hear or detect a bird responding to playback. There are two possibilities: either the bird responds as quickly as possible, (but it sometimes takes the bird a while to hear the playback while moving about in its territory) or the bird attempts to sight the intruder initially and does not respond vocally until later. At many sites, the water was quite loud. Hence, it was very much by chance that we would hear the bird singing. The bird had to be very close to us in order to be heard. Although it could be argued that the playback may not have had the volume to be discerned above the water, the quality of the song transmission and how well the birds receive it through the water noise are not known. The reduction of signal degradation in this space may outweigh the background noise the habitat offers.

Studies of territoriality in flycatchers using playback have used a mounted decoy atop the speaker (Stein 1963). The visual element to the flycatcher response is important. This can be implied from their predilection for singing from exposed perches and use of obvious display (Skutch 1997). Perhaps the “Western Flycatcher” will not commit the energy to responding aggressively until it is sure of what it is dealing with. One bird we encountered was spotted silently approaching the source of the playback. It continued to move closer, perching about 10 m away, looking

around vigorously. As it looked away from us, we would play the tape. It would turn around and silently, come closer, searching even more frantically. This continued for about 4 minutes when the bird finally broke into vigorous song about 2 m from the source of the playback. Without the visual confirmation of an intruder, the bird seemed hesitant to vocalize.

The first record for a “Western Flycatcher” in Alberta occurred in 1954 (Salt and Salt 1976) near Turner Valley, not coincidentally, an area where there is a high concentration of them today. Campbell *et al.* (1997) notes that the Western Flycatcher complex has expanded its range north and eastward in British Columbia since the mid-1940s. It is now common in areas of British Columbia where it was once a rarity. This expansion would coincide with the first sighting in Alberta and may explain the increased number of sightings for the province. If the “Western Flycatcher” has been expanding its range, has it reached the limit of eastern expansion? Elevation does not seem to be an issue. We have noted that they prefer the middle elevations in the mountains. They are, in fact more common in the foothills at the lower elevations. Habitat would seem to be an essential issue limiting the birds’ expansion east. The sites in the interior of the mountains were often in steep-walled canyons while the foothills sites were often more open. Many sources (Bent 1942, Davis *et al.* 1963, Campbell *et al.* 1997) note Western Flycatchers using human structures such as bridges, barns, and house eaves for nesting sites. This is a plausible means for the “Western Flycatcher” to expand eastward although there are no confirmed records along the rivers east of the foothills.

Status in Alberta

Our study has revealed that simply classifying members of the Western Flycatcher complex within our province as Cordilleran Flycatchers is not wholly accurate. Based on our preliminary findings and the unpublished work by Richard Cannings and Eugene Hunn, it is likely that the Pacific-slope Flycatcher occurs in Alberta and may possibly be the only “Western Flycatcher” in Alberta. With this in mind it is difficult to suggest a status for a bird whose true identity we do not know. Additional work will be needed to determine the identity of the Alberta populations of Western Flycatchers before management implications are known.

Literature Cited

- Alberta Natural Heritage Information Centre. 1999. *Alberta natural region land classification system*. URL: <http://www.gov.ab.ca/env/parks/anhic/landclas.html> Last updated: December 22, 1999.
- Alberta Wildlife Management Division. 1996. *The status of Alberta wildlife*. Alberta Environmental Protection, Edmonton, AB. 44 pp.
- American Ornithologists' Union. 1989. Thirty-seventh supplement to the American Ornithologists' Union, *Check-list of North American birds*. Auk 106:591-596.
- Bent, A. C. 1942. *Life histories of North American flycatchers, larks, swallows and their allies*. United States National Museum Bulletin 179. 555 pp.
- Campbell, R. W., N. K. Dawe, I. McT-Cowan, J. M. Cooper, G. W. Kaiser, M. C. E. McNall and G.E.J. Smith. 1997. *The birds of British Columbia - Volume 3: Passerines (flycatchers through vireos)*. Royal British Columbia Museum and Canadian Wildlife Service, Victoria. 693pp.
- Davis, J., G. F. Fiesler, and B. S. Davis. 1963. The breeding biology of the Western Flycatcher. *Condor* 65:337-382.
- DeGraaf, R. M., and J. H. Rappole. 1995. *Neotropical Migratory Birds*. Cornell University Press, Ithaca, New York. 676 pp.
- Dickinson, M. B., ed. 1999. *Field Guide to the Birds of North America*. Third Edition. National Geographic, New York, New York.
- Holroyd, G. L., and K. J. Van Tighem. 1983. *The Ecological (Biophysical) Land Classification of Banff and Jasper National Parks, Vol. 3, The Wildlife Inventory*. Canadian Wildlife Service, Edmonton, Alberta. 691pp.
- Johnson, N. K. 1980. *Character variation and evolution of sibling species in the Empidonax difficilis-flavescens complex (Aves: Tyrannidae)*. University of California Press, Berkeley. 151 pp.
- Johnson, N. K. 1994. Old-school taxonomy versus modern biosystematics: species level decisions in *Stelgidopteryx* and *Empidonax*. *Auk* 111: 773-780.
- Johnson, N. K., and J. A. Marten. 1988. Evolutionary genetics of flycatchers. II. Differentiation in the *Empidonax difficilis* complex. *Auk* 105:177-191.
- McGillivray, W. B., and G. P. Semenchuk. 1998. *Federation of Alberta Naturalists Field Guide to Alberta Birds*. Federation of Alberta Naturalists, Edmonton, Alberta. 350 pp.
- Pinel, H. W., W. W. Smith and C. R. Wershler. 1993. *Alberta Birds, 1971-1980. Vol 2. Passerines*. Provincial Museum of Alberta Natural History Occasional Paper No.20, Edmonton, Alberta.
- Salt, W. R., and J. R. Salt. 1976. *The Birds of Alberta with their ranges in Saskatchewan and Manitoba*. Hurtig Publishers, Edmonton, Alberta.
- Sauer, J. R., J. E. Hines, G. Gough, I. Thomas, and B. G. Peterjohn. 1997. *The North American Breeding Bird Survey Results and Analysis*. Version 96.4. Patuxent Wildlife Research Center, Laurel, MD
- Semenchuk, G. P., ed. 1992. *The Atlas of Breeding Birds of Alberta*. Federation of Alberta Naturalists, Edmonton, Alberta.
- Skutch, A. F. 1997. *Life of the Flycatcher*. University of Oklahoma Press, Norman, Oklahoma. 162 pp.

Stein R. C. 1963. Isolating Mechanisms between populations of Traill's Flycatchers. *Proceedings of the American Philosophical Society* 107:21-50.

Acknowledgments

We would like to thank the Alberta Conservation Association and the Provincial Museum of Alberta, Alberta Community Development for their financial support of this project. Special thanks are extended to Doug Leighton, Dick Cannings, Eric Tull and Roger Brown for providing insight and access to personal records on *Empidonax*. The Federation of Alberta Naturalists supplied Atlas records. Kevin Van Tighem (Parks Canada) and Peter Achuff (Parks Canada) assisted with the acquisition of the proper permits for the national parks. We are also pleased to acknowledge the assistance of Trevor Wiens, Glen Semenchuk and Bill Weimann in the field. The Kananaskis Centre for Environmental Research (University of Calgary) provided ideal accommodation in support of field studies. The manuscript was read and much improved by the comments of Jim Burns and Alwynne Beaudoin (Provincial Museum of Alberta).