FIRST NEST OF THE YELLOW-BELLIED FLYCATCHER FOR ALASKA, WITH NOTES ON BREEDING BIOLOGY

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ABSTRACT: We discovered a breeding population of Yellow-bellied Flycatchers (*Empidonax flaviventris*) during the summer of 2004 in a mountainous area northwest of Fairbanks, Alaska. A minimum of 13 males, all apparently paired, were defending territories in open montane forest with patches of thick alder, birch, and willow. Expanses of similar unsurveyed habitat suggested the possibility of a much larger population. A nest with four eggs provided the first evidence of this species' breeding in Alaska. We recorded behavior at this nest by 24-hour videotaping during incubation and when nestlings were 1 and 8 days old. The nestlings fledged after 15 days. This information extends the known breeding range of the Yellow-bellied Flycatcher west of Canada for the first time and, with other sites of suspected breeding, suggests the species may have a broader breeding distribution in Alaska, particularly in remote stretches of the Yukon River drainage.

The breeding range of the Yellow-bellied Flycatcher (*Empidonax flaviventris*) extends from the boreal forests in the higher elevations of the Appalachian Mountains north through the northeastern United States to the boreal forests of Canada, from Newfoundland to Yukon Territory (Gross and Lowther 2001). The first Alaska record, of an adult female on 28 July 1966 at the confluence of Coal Creek and the Yukon River (White and Haugh 1969), remained unique for 20 years. Beginning in the mid 1980s, there were occasional records of singing males and migrants from several locations in the state (Table 1). In the early 1990s, when Breeding Bird Surveys were initiated along the roads of interior Alaska (Tobish 2004), a few Yellow-bellied Flycatchers began to be found almost annually north of the Alaska Range in east-central Alaska (Benson et al. 2000; Table 1). At the end of the 20th century, Benson et al. (2000:102) postulated a recent range expansion of this species into east-central Alaska, where "now known as a possible breeder and rare fall visitant," based on nine individuals netted in August (1993–1998) and 18 records in June (1992–1998) (Benson et al. 2000:102; Table 1).

On 19 June 2004, while surveying for sites suitable for studying breeding of the Alder Flycatcher (*Empidonax alnorum*), Gray-cheeked Thrush (*Catharus minimus*), and White-crowned Sparrow (*Zonotrichia leucophrys*), Martin and Bonier discovered a population of the Yellow-bellied Flycatcher northwest of Fairbanks. The site was located along the Rampart Road near Eureka, approximately 9.5 km north of the junction with the

Table 1 Published records of the Yellow-bellied Flycatcher in Alaska

Location	Date	Number of birds	Reference; specimen number[a]
Near the confluence of Coal Creek and Yukon River	28 Jul 1966	2 individuals (1 ad. female)	White and Haugh 1969; UAM 3078
Chitina area	21–29 Jun 1986	1 singing male	*Am. Birds* 49:1243, 1986
Hyder	18 Jun 1989	1 individual	*Am. Birds* 43:1356, 1989
Colville River delta	6 Sep 1989	1 immature male	UAM 7060
Hyder area	24–25 Jun 1990	1 singing male	*Am. Birds* 44:1172, 1990
Richardson, Taylor, and Alaska highways	10–28 Jun 1992–98	singing males/ 2–9 yr, 18 total	Benson et al. 2000; UAM 6576
Mitkof Island	23–25 Jun 1993	1 adult male	*Am. Birds* 47:1140, 1993; UAM 6366
Fairbanks	20 Aug 1993	1 immature female	Benson et al. 2000; UAM 6373
Chitina area	15 Jun 1994	1 individual	*Field Notes* 48:977, 1994
Tok area	4 Aug 1994	1 individual	Benson et al. 2000
Tok area	8 Aug 1994	1 immature male	Benson et al. 2000; UAM 6579
Tok area	16 Aug 1994	1 individual	Benson et al. 2000
Northway:			
45 km southwest	27 Jun 1995	1 singing male	*Field Notes* 49:965, 1995
Fairbanks	17 Jun 1996	1 individual	*Field Notes* 50:984, 1996
Tok area	23 Aug 1996	1 immature	Benson et al. 2000
near Skagway	12 Jun 1997	1 calling	*Field Notes* 51:1038, 1997
Fairbanks	13 Aug 1997	1 immature female	Benson et al. 2000; UAM 7427
Fairbanks	15 Aug 1997	1 individual	Benson et al. 2000
Tok area	27 Aug1998	1 individual	Benson et al. 2000
Tok area	22 Jun 2000	1 individual	*N. Am. Birds* 54:413, 2000
Fairbanks	11 Aug 2001	1 individual	*N. Am. Birds* 56:91, 2002
Alaska Hwy near Canadian border	7 Jun 2004	2 individuals	*N. Am. Birds* 58:419, 2004
Juneau	29 Jun–4 Jul 2004	1 individual	*N. Am. Birds* 58:584, 2004
9.5 km north of the Elliott Hwy on Rampart Rd.	Jun–Jul 2004	13+ pairs	*N. Am. Birds* 58:584, 2004; this paper

[a]UAM, University of Alaska, Fairbanks.

Elliott Highway (locally known as Deadhorse Pass, Minook Valley; 65.23° N, 150.18° W, 585 m elevation). During field work at this site we heard at least 13 different males either countersinging or singing from sites at least 100 m apart. We made no attempt to survey farther afield, but apparently similar habitat extends in all directions from the site, suggesting the possibility of a substantial population.

Most if not all males probably paired and bred, as suggested by a general reduction in song rates over the season and the persistence of similar numbers of birds into July. We located a nest with four eggs on 30 June 2004, the first nest of the Yellow-bellied Flycatcher recorded in Alaska. Here we provide details of the breeding biology of the Yellow-bellied Flycatcher based on observations and measurements made at this nest, in addition to more general observations on this population's habitat use.

Figure 1. Habitat of nesting Yellow-bellied Flycatchers near Eureka, Alaska. Territories were located primarily in the gullies wooded with deciduous trees interspersed by tundra (background), with few individuals occupying mixed coniferous woodland (foreground).

Figure 2. Habitat within the territory of the nest described in this paper. Note the thickets dominated by alder (*Alnus crispa*), willows (*Salix* spp.), and birch (*Betula* spp.), and the interspersed areas of open tundra.

METHODS

We used a Hi-8-mm video camera to record the behavior at the nest, placing the tripod and camera approximately 8 m from the nest and concealing them with vegetation. The female did not flush from the nest during visits to change tapes, and we noted no responses to the camera or tripod. We

Figure 3. Yellow-bellied Flycatcher nest containing four eggs, 30 June 2004. This represents the first nest for Alaska and a westward extension of the breeding range of the species.

used an Acculab (PP2060D) portable scale and 50.0-g reference weight to measure the mass of eggs, nestlings, and nest components. We used calipers to measure nest, eggs, and nestlings and recorded vegetation by using Hultén (1968) as a reference. Descriptions of egg shape and markings follow Harrison (1979), while descriptions of nestlings' plumage development follow the feather-tract nomenclature of Clench (1985).

RESULTS

General Habitat Use

Yellow-bellied Flycatchers were found in open montane forest with patches of thicker vegetation and a thick ground cover of moss and lichen, at elevations from 200 to 600 m (Figure 1). Dominant tree species included the green mountain alder (*Alnus crispa*), the paper birch (*Betula papyrifera*), the willows *Salix phylicifolia planifolia*, *S. alaxensis*, *S. bebbiana* (= *S. depressa*), and, in lower-elevation territories, the white spruce (*Picea glauca*) and, to a lesser extent, the black spruce (*P. mariana*), with scattered black cottonwood (*Populus balsamifera*) and quaking aspen (*P. tremuloides*) throughout. Shrub layers were patchy and composed of willow and alder saplings and the northern red currant (*Ribes triste*) in the thick deciduous thickets, dwarf birch (*Betula nana*), bog blueberry (*Vaccinium uliginosum*), and Alaska spiraea (*Spiraea beauverdiana*) in brushy open forest, and *Salix brachycarpa* and young *Betula papyrifera*. Ground cover in the open tundra was dominated by the low-bush cranberry (*Vaccinium vitis-idaea*), *V. uliginosum*, black crowberry (*Empetrum nigrum*), and Labrador tea (*Ledum palustre*).

Breeding Bird Community

Over the course of field work at this site, we observed the following species within 500 m of Yellow-bellied Flycatcher territories: Green-winged Teal (*Anas crecca*), Bufflehead (*Bucephala albeola*), Ruffed Grouse (*Bonasa umbellus*), Spruce Grouse (*Falcipennis canadensis*), Willow Ptarmigan (*Lagopus lagopus*), Sharp-shinned Hawk (*Accipiter striatus*), Red-tailed Hawk (*Buteo jamaicensis*), Peregrine Falcon (*Falco peregrinus*), Solitary Sandpiper (*Tringa solitaria*), Spotted Sandpiper (*Actitis macularius*), Herring Gull (*Larus argentatus*), Olive-sided Flycatcher (*Contopus cooperi*), Alder Flycatcher, Hammond's Flycatcher (*Empidonax hammondii*), Gray Jay (*Perisoreus canadensis*), Common Raven (*Corvus corax*), Tree Swallow (*Tachycineta bicolor*), Violet-green Swallow (*T. thalassina*), Bank Swallow (*Riparia riparia*), Black-capped Chickadee (*Poecile atricapillus*), Boreal Chickadee (*P. hudsonica*), Ruby-crowned Kinglet (*Regulus calendula*), Townsend's Solitaire (*Myadestes townsendi*), Gray-cheeked Thrush, Swainson's Thrush (*C. ustulatus*), American Robin (*Turdus migratorius*), Varied Thrush (*Ixoreus naevius*), Bohemian Waxwing (*Bombycilla garrulus*), Orange-crowned Warbler (*Vermivora celata*), Yellow Warbler (*Dendroica petechia*), Yellow-rumped Warbler (*D. coronata*), Northern Waterthrush (*Seiurus noveboracensis*), Wilson's Warbler (*Wilsonia pusilla*), Fox Sparrow (*Passerella iliaca*), Lincoln's Sparrow (*Melospiza lincolnii*), White-crowned Sparrow, Dark-eyed Junco (*Junco hyemalis*), Pine Grosbeak (*Pinicola enucleator*), White-winged Crossbill (*Loxia leucoptera*), Common Redpoll (*Carduelis flammea*), and Pine Siskin (*C. pinus*).

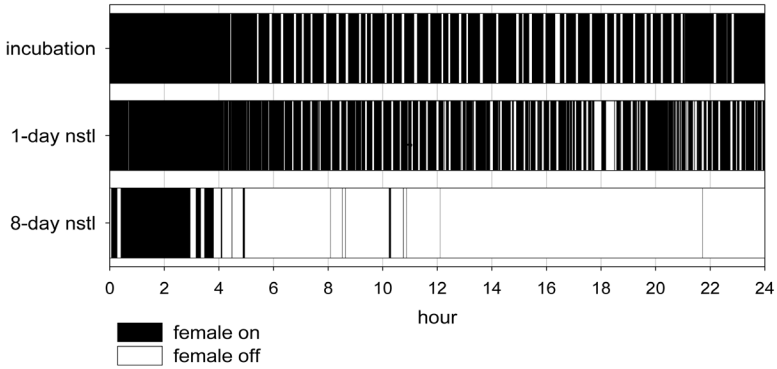

Figure 4. Incubation and brooding behavior at the Yellow-bellied Flycatcher nest over three 24-hour periods (midnight to midnight), during incubation, when the nestlings were 1 day old, and when they were 8 days old.

Figure 5. Yellow-bellied Flycatcher nestling on its day of hatching, when only hours old.

Figure 6. Yellow-bellied Flycatcher nestling 4 days old.

Figure 7. Yellow-bellied Flycatcher nestling 6 days old.

Figure 8. Yellow-bellied Flycatcher nestling 9 days old.

Figure 9. Yellow-bellied Flycatcher nestlings14 days old. Three nestlings successfully fledged on 20 July 2004, after a 15-day nestling period.

Nest

Site. The nest was located on the ground, at the base of small sapling *Salix* sp. and *Alnus crispa* growing together, on a steep mossy embankment (Figures 2, 3). It was built in a small depression on a west-facing slope of approximately 45˚, in a dense patch of alder, paper birch, and willows growing below a road cut.

Structure and Composition. Nest measurements were made on 30 June 2004 during incubation (prior to nest expansion by growing nestlings): inner cup 5.0 × 5.0 cm, outer cup 12.0 × 11.5 cm; cup depth 3.5 cm; nest depth 6.0 cm. After the young fledged, we collected, dried, and weighed the nest (8.68 g). It consisted of *Lycopodium* spp. moss (including leaves, stalk, and rootlets; 6.70 g or 77.1%), dried grass (1.01 g or 11.6%), dead leaves (mainly small bits; 0.47 g or 5.4%), thin bark strips (0.25 g or 2.8%), very small twigs (0.12 g or 1.4%), black rootlet-like material (0.07 g or 0.8%), and moose (*Alces alces*) hair (0.07 g or 0.8%). The nest did not contain any feathers.

Eggs

On 30 June at 15:30 ADT, 5 days prior to hatching, the four eggs measured 17.9 × 13.4 mm (1.491 g), 18.0 × 13.7 mm (1.544 g); 18.6 × 13.7 mm (1.640 g), and 17.9 × 13.3 mm (1.538 g). We estimated the eggs' water loss by weighing them 4 days later, finding a mean loss of 0.0131 g per 24 hours (range 0.0119–0.0146 g per 24 hours). The eggs were somewhat short and oval (Harrison 1979) and were generally white with bold rufous-brown blotches concentrated in a thick wreath around the larger end of the egg, giving way to mostly white at the extreme tip of the large end of the egg. Scattered rufous-brown speckles and blotches were found over most of the eggs, declining in frequency towards the small end, which was almost free of speckling (Figure 3).

Incubation Behavior

We recorded behavior at the nest over a 24-hour period (midnight to midnight) on 2 July (Figure 4). Incubation during this interval was by only one bird, presumed to be the female on the basis of vocalizations and previous reports of exclusively females incubating in this species (Gross and Lowther 2001). Despite 24 hours of available daylight, the female went into a nocturnal phase of incubation between 22:53 and 04:25. During this time, the female incubated constantly, but activity on the nest continued every 15–25 minutes in the form of egg turning, preening, and the incubating bird's adjusting her position on the nest. At 04:25 the female began her series of regular bouts on and off the nest that continued throughout the day. Her mean bout on the nest (excluding the night bout) was 21.1 minutes (range 3.7–67.3 minutes); the mean bout off the nest was 5.0 minutes (range 0.78–10.82 minutes). Overall, the female spent 84.3% of the 24 hours on the nest (79.6% of the time excluding the nocturnal phase). The male did not feed the female on the nest. The male did, however, come to within 20–25 cm of the nest regularly, looking in at the female incubating, and he frequently chased the female as she left the nest. The male also moved with the female during some of her time off the nest as she foraged, and the

pair called to one another regularly, particularly as the female left the nest. The female's intervals spent on and off the nest did not vary much through the day, with the exception of early and late bouts on the nest, which were longer (Figure 4). On two occasions the female spotted something (not visible on video) that audibly stirred dead leaves near the nest. Then she flew from the nest and began snapping her bill rapidly. After 1 to 2 minutes, she returned to the nest and stayed on it for over 1 hour (first time) and for the rest of the night (second time). Extended bouts of incubation in response to a predator are known in other species (Tewksbury et al. 1999), and the 67.3-minute bout of incubation following the one disturbance may have reflected this response.

Nestlings

Three of four eggs hatched on 5 July, sometime before 19:00 ADT. One nestling had matted, moist down at 19:00, suggesting afternoon hatching. Despite having just hatched, the nestlings made soft high-pitched begging calls. One egg did not hatch, and we collected it on 6 July. Preparation revealed an embryo 2 mm long. This egg was deposited at the Burke Museum, University of Washington. We weighed, measured the tarsus, and assessed the development of all three nestlings on hatch day and when they were 4, 6, and 9 days old. On the day of hatching the nestlings were orange-pink with a yellow gape and eyes closed. They were naked ventrally with extensive dark gray down up to 9 mm long on the crown, sparse dark gray down on the back of the head, nape, and upper portions of wings and back. Their bills, wings, tarsi, feet, and cloacas were yellow. Their weights were 1.40, 1.41, and 1.52 g; their tarsi all measured 6 mm (Figure 5).

At the age of 4 days the nestlings' plumage had developed as follows: pteryla capitalis, very short dark gray pins beginning to emerge; pteryla spinalis, short gray pins emerging; pteryla ventralis, short yellow pins flanked by gray anteriorly; pteryla humeralis, short dark gray pins emerging, longer than body pins, including pins of primaries and secondaries (primary pins 1 mm); pteryla cruralis, a few dark gray pins beginning to emerge; pteryla caudalis, virtually nothing apparent; down still present, although less dense, on crown, and sparse on back of head, nape, back, and upper portions of wing; bill, gape, tarsi, feet, and cloaca yellow; eyes closed; skin generally pink. Measurements (mass, tarsus): 5.44 g, 11 mm; 5.82 g, 10 mm; 6.17 g, 10 mm (Figure 6).

At the age of 6 days the nestlings had progressed as follows: pteryla capitalis, dark gray pins grown in but sheaths not broken; pteryla spinalis, dark gray pins grown in, white at tips but sheaths not broken; pteryla ventralis, long yellow pins grown in but sheaths not broken, gray on sides of breast; pteryla humeralis, dark gray pins present on coverts and primaries and secondaries but no sheaths broken (primary pins 9 mm; likely broke their sheaths at the tips at 7days of age); pteryla cruralis, sparse dark gray and yellow pins present, sheaths not broken; pteryla caudalis, short (3 mm) dark gray pins present, sheaths unbroken; sparse dark gray down still present on either side of crown pins, and sparse on back of head, nape, back, and upper portions of wing; bill and gape yellow, with darker tones on maxilla; tarsus mauve, feet yellow-mauve, and cloaca pinkish yellow; eyes open some of the time; skin generally pink. Measurements (mass, tarsus): 8.36 g, 14

mm; 8.41 g, 14 mm; 9.31 g, 14 mm (Figure 7).

At the age of 9 days the nestlings' development was as follows: pteryla capitalis, dark gray pins breaking their sheaths on back of head and nape but not on forehead or anterior crown; pteryla spinalis, dark gray pins half broken from their sheaths along back; pteryla ventralis, long yellow pins one-half to two-thirds broken from their sheaths, gray on sides of breast; pteryla humeralis, coverts one-half broken from their sheaths, showing dark gray and buff wing bars; primary and secondary pinfeathers broken from their sheaths 2–3 mm; pteryla cruralis, sparse pins beginning to break from sheaths; pteryla caudalis, short (8–10 mm) dark gray pins breaking from sheaths at tips; sparse dark gray down on head and nape; down on back still present but hardly noticeable; mandible and gape yellow; maxilla dark gray; tarsus and feet dark gray, giving way to mauve and then yellow on posterior sides and soles; cloaca pink, ringed with small yellow feathers in the process of breaking from sheaths; eyes primarily open; skin generally dark pink. Measurements (mass, tarsus): 11.23 g, 18 mm; 12.28 g, 19 mm; 13.14 g, 18 mm (Figure 8). Video revealed nestlings stretching and flapping wings in the nest at 8 days. The nestlings were alert when measured at 9 days (primary pin feathers broken from their sheaths 2–3 mm), and one attempted to fledge. All were replaced, and all remained in the nest until 20 July: a 15-day nestling period. Although we did not measure the nestlings after an age of 9 days, we photographed them at 14 days (Figure 9). At this stage the young were alert and resembled the adults in plumage except for their short tails, yellow gapes and brighter plumage color, particularly noticeable in the yellow on the breast (and probably belly).

Nestling-Feeding Behavior. We videotaped the nest for 24-hour periods on 6 July (nestlings 1 day old) and on 13 July (nestlings 8 days old), within a day of the primary pinfeathers' first breaking from their sheaths. Both adults fed the nestlings frequently, making 180 feeding trips on 6 July and 468 trips on 13 July (over 24 hours) (Figure 10). A video clip of the nestlings being fed can be viewed at the Yanayacu Natural History Research Group's website (http://depts.washington.edu/nhrg/).

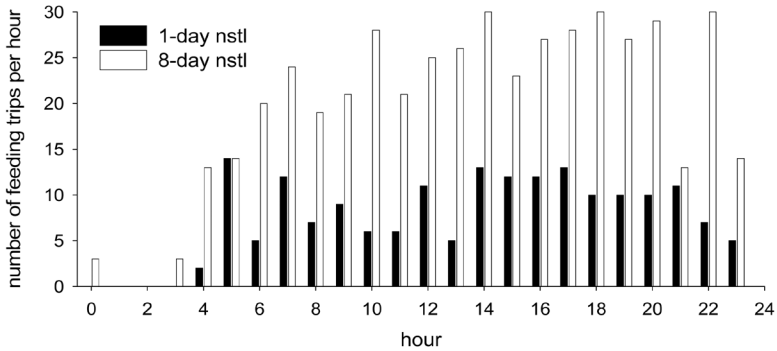

Figure 10. Hourly feeding rates of 1-day-old (black bars) and 8-day-old (white bars) nestlings. Trips include both male's and female's combined.

Fecal-Sac Removal. When the nestlings were 1 day old, the adults ate all fecal sacs the young excreted. We could not ascertain the rate of fecal-sac production at this stage from video. When the nestlings were 8 days old, the adults removed all fecal sacs from the nest, carrying them away. We do not know the outcome of fecal sacs once carried from the nest, although we suspect they were not eaten. The adults carried off 59 fecal sacs over the 24 hours we videotaped the 8-day-old nestlings, with no fecal sacs from midnight to 04:19, followed by 1–6 fecal sacs per hour through the rest of the day to midnight (average 2.95 per hour from 04:00 to 24:00).

Adults' Behavior at Nest

Nest-Probing Behavior and Ectoparasites. During the incubation and nestling periods, the female was observed to probe the nest lining at regular intervals. This probing occasionally became rapid, like a sewing machine in frequency, but more regularly consisted of several rapid probes into the nest lining alternated with staring. Such probing behavior has been observed in other passerines and is hypothesized to function in parasite removal (Dobbs et al. 2003). While we did not quantify the probing rate during nest watches in general, we did quantify it during a 1-hour interval (08:00–09:00) with 8-day-old nestlings as an example. During this hour, the female probed the nest on four occasions, spending a total of 116 seconds either staring into the nest or probing the nest lining.

We did not witness any ectoparasites in the nest or on the nestlings during our measurements of nestling growth. After collecting the nest, however, we found an abundance of red mites (Arachnida: Acari) in the lining of the nest; they appeared to leave the nest in response to the warmth of our hands. As we had not looked for mites specifically during nestling measurements, they could have been present on nestlings or in the nest throughout the nesting period.

Nest Defense. On two occasions during incubation, and on three occasions during videotaping of 1-day-old chicks, the female flushed off the nest in response to a disturbance. During all of these events, stirring of the leaf litter was audible on the tape, and a small rodent was observed to flush the female on two of the occasions. On all occasions, the female flushed and immediately began periodic rapid bill-snapping, likely associated with flights at the potential threat. We observed similar behaviors during our visits to the nest, particularly later in the nestling period, when the female approached us to < 1 m and snapped her bill during short flights around the nest.

Other Behaviors. When the nestlings were 1 day old, the male frequently gave food to the brooding female, who then fed the young. When the male came to feed while the female brooded, he passed the food to the female on eight occasions, and on another six occasions he fed the nestlings directly, underneath the female. Passing of food between parents was not observed later in the nestling period (8-day-old nestlings).

The adults were not observed adding material to the nest during the incubation or nestling periods, but they were observed occasionally removing material. When the nestlings were 1 day old, adults left the nest on one occasion with a piece of dry grass, on another occasion with a piece of dead

leaf. When the nestlings were 8 days old, an adult removed a small stick. No other removals of material were noted during observations.

Food and Foraging. We could not identify food brought to the nest, except for some dark brown moths and winged insects. We observed the adults foraging on several occasions, when they foraged primarily within 2 m of the ground in thick stands of mixed alder, willow, and birch. The adults sally-gleaned (Remsen and Robinson 1990), taking prey (presumably arthropods) from leaves and then flying to a new perch nearby. Territorial males frequently sang from isolated tall *Betula papyrifera* but were infrequently observed foraging there.

Interactions with Other Species. Three species of *Empidonax* flycatchers defended territories at our field site. On 22 June, a male Hammond's Flycatcher moved onto the territory where the nest was located and interacted aggressively with the male Yellow-bellied Flycatcher. Throughout the morning, for several hours, the male Hammond's Flycatcher chased the male Yellow-bellied Flycatcher around the territory. The male Hammond's sang its full song and frequently repeated the lowest, scratchy syllable of the song ("*tsurrt,*" Sedgwick 1994) over and over, apparently in response to the singing male Yellow-bellied Flycatcher. Chases in the air sometimes extended for 50 m, with both birds alighting in the same tree. The male Hammond's remained on the Yellow-bellied's territory for 2–3 days, aggressively chasing the male Yellow-bellied, but eventually disappeared.

Other Hammond's Flycatchers defended territories on the site, and we thought they nested. Hammond's habitat was similar to that used by Yellow-bellied Flycachers but generally included taller trees, deeper in the ravines. The Alder Flycatcher was also common on the site, breeding (six nests) in flatter, wetter, and shrubbier habitat than the Yellow-bellied Flycatchers. Territories of Yellow-bellied and Alder flycatchers did abut and probably overlapped to a limited extent, but we observed no interactions between these two species.

DISCUSSION

Evidence that Yellow-bellied Flycatchers breed in Alaska has come from several locations in the east-central portions of the state (Benson et al. 2000, Tobish 2004). The location of this population of Yellow-bellied Flycatchers—to the north and west of Fairbanks—was farther west than expected. The size of the population and abundance of habitat at this site suggests that this species may well be more widespread in Alaska, particularly along the Yukon River drainage. However, it is also possible that the Eureka birds constitute an outlying enclave beyond the main nesting range of the species.

Habitat use of this population of Yellow-bellied Flycatchers differed from typical breeding habitats described for this species. The typical breeding habitat is dominated by conifers, with deciduous trees constituting no more than half of the dominant tree species (Gross and Lowther 2001). In contrast, most of the Yellow-bellied Flycatcher territories northwest of Fairbanks included almost no coniferous trees whatsoever. Instead, the territories were composed of dense deciduous thickets of alder, willow, and birch, and open

areas of tundra interspersed with paper birch. A ground cover of thick moss and steep slopes were found in all territories, and birds were observed foraging primarily within 2 m of the ground, within thickets. This departure from coniferous habitat is also characteristic of Hammond's Flycatcher in Alaska, where that species nests "primarily in tall deciduous ... forests, sometimes with spruce interspersed" (Kessel and Gibson 1978:58). In the southern portions of Hammond's range it is associated with tall coniferous forest almost exclusively (Sedgwick 1994).

Despite the Yellow-bellied Flycatcher's broad geographic distribution, its breeding biology is poorly known. Much of what is known about this species has come from early work on nests in Michigan (Walkinshaw and Henry 1957, Walkinshaw 1967) and from intensive work in the mountains of Pennsylvania (Gross and Lowther 2001). The basic information on breeding behavior we describe, including nestling-feeding rates and brooding behavior, is the first such data reported for the species (cf. Gross and Lowther 2001). The nestling period we report is only the second recorded. The previous report of a 13-day nestling period came from Michigan (Walkinshaw and Henry 1957) and might have represented a premature fledging resulting from disturbance. At the Alaska nest, the nestlings were capable of fledging at 9 days but, when undisturbed, remained in the nest another 6 days. Also of note was the pattern of activity of Yellow-bellied Flycatchers at such a high latitude. Late in the nestling period, the birds were active for 21.5 hours of the day, with feeding rates reaching a high of one feeding every 2 minutes. Despite 24 hours of available daylight, however, the female Yellow-bellied Flycatcher reducted her activity from shortly after midnight to 03:00 or 04:00 (Figures 4, 10).

Overall, the breeding population northwest of Fairbanks provided a valuable look into the Yellow-bellied Flycatcher's habitat use and breeding biology near or at the edge of its breeding distribution. Further surveys will be required before this species' breeding range in Alaska is known with certainty.

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