Alaska Department of Fish and Game
Division of Wildlife Conservation

Abundance, Timing, and Demography of Neotropical Migratory Birds during Migration and Preliminary Study of Olive-sided Flycatchers in Alaska

John M Wright

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Grants SE-3-3 and SE-3-4
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RESEARCH PROGRESS REPORT

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PROJECT: Monitoring Neotropical Migratory Birds in Alaska

STUDY TITLE: Abundance, Timing, and Demography of Neotropical Migratory Birds during Migration and Preliminary Study of Olive-sided Flycatchers in ALaska

AUTHOR: John M Wright

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SUMMARY

Monitoring of migratory songbirds continued at the Creamer's Refuge banding station in a cooperative project with the Alaska Bird Observatory. 1996 was the 5th year of this long-term project. The standard array of 30-40 mist nets was operated for 44-45 days in springs 1995 and 96, and 57-58 days each fall in 1995-96. Spring capture rates in these 2 years were consistent with prior years, except for the lower captures in the extremely late and snowy spring of 1992. Fall capture rates in 1995 and 1996 were similar to 1994; fall 1993 was markedly lower and fall 1992 higher. The majority (80-90% of individuals and 60-75% of species) of captures were long-distance migrants, including Hammond's Flycatcher, Swainson's Thrush, Orange-crowned Warbler, Yellow-rumped Warbler, Northern Waterthrush, Wilson's Warbler, and Lincoln's Sparrow.

Olive-sided Flycatcher field studies continued in summers 1995-96, focusing on singing behavior, breeding biology and habitat use. Breeding Bird Survey counts of Olive-sideds in Alaska vary greatly from year to year. Many factors other than bird abundance may influence these survey results. Olive-sided males returned from wintering areas by the last week in May, but 26% of detected males did not establish territories where they were heard singing. Males on territory sang consistently until a female was attracted, usually early in the first week of June, and then singing rates dropped dramatically during the bonding-nest building period (approximately 1 week). Once egg laying was underway, males resumed singing at intermediate rates until hatching. Success of first nests was very poor (1 of 5) in 1995 but was better in 1996 (5 of 8). Renesting occurred in 3 of 7 failed attempts; 2 were successful. Singing Olive-sideds were detected at an average of 654 m (s = 159) in coniferous forest and woodlands. Two (1 male, 1 female) of 6 (4M, 2F) color banded adults returned to the same site in the year following banding. Seventeen breeding territories

averaged 17.9 ha (s = 4.5). Perches were dominant trees, averaging 1.4 times the height of surrounding canopy. Spruce were used for perching 91% of the time, while larch were used the remaining 9%. Three-quarters of perches were either "dead-topped" or completely dead trees, 1/4 were live-topped trees. In contrast, nests were constructed in subdominant, live trees, again predominantly spruce.

Key words: breeding biology, *Contopus borealis* monitoring, Neotropical migratory birds, Olive-sided Flycatcher.

CONTENTS

BACKGROUND

Declines in populations of migrant landbirds have been well documented in the United States and Canada. Among the species undergoing the largest declines are long-distance migrants, the North American breeders wintering in Neotropical Central and South America, including flycatchers, thrushes, vireos, and wood warblers (Finch 1991, Sauer and Droege 1992). Alaska is an important part of the breeding range of several species of boreal forest landbirds that are known to be declining in other portions of their geographic range in North America.

In conjunction with the international *Partners in Flight* Neotropical Migratory Bird Conservation Program, a *Boreal Partners in Flight* working group has been organized. This Alaskan/Yukon group is composed of federal and state agencies, conservation organizations, independent bird research groups, and concerned individuals. *Boreal Partners in Flight* provides coordination and direction for local projects so that a comprehensive statewide monitoring and research program can be formed from the individual efforts of the many partners.

Monitoring of Neotropical migrants in Alaska will be accomplished through several methods. The Breeding Bird Survey (BBS) is the primary monitoring technique in most of North America, and this road-based method will be used as much as possible, but is obviously of limited use in the many roadless areas of Alaska. Off-road point counts will supplement the BBS where they are logistically feasible. Migration studies will be used at a few selected locations to monitor abundance and productivity on a broader geographic scale.

The Creamer's Refuge migration monitoring station was established as such a study in 1992 by the Alaska Bird Observatory (ABO) in cooperation with the Alaska Department of Fish and Game (ADF&G). This project at Creamer's Refuge was the only spring and fall migration study in the state, and the first monitoring project to sample a broad cross-section of the boreal forest, the dominant physiographic region in Alaska. Fall ratios of young of the year to adults provide an important indicator of breeding productivity.

Among the neotropical migrants, the Olive-sided Flycatcher (*Contopus borealis*) is one of the species with a well-documented population decline, consistent both in time over the nearly 30 years of the BBS and geographically across the Olive-sided's broad breeding distribution. This bird is recognized by US Fish and Wildlife Service as a national Species of Management Concern and is listed on ADF&G's Species of Special Concern. It was also included on the Category 2 Candidate list of Federal Endangered Species until that category was eliminated. Although the Olive-sided Flycatcher is a conspicuous component of boreal and montane coniferous forests throughout North America, only anecdotal information on their basic biology is available. No single-species study has ever been conducted on Olive-sided Flycatchers.

OBJECTIVES

The study objectives for neotropical migratory birds were to:

1. monitor the abundance, timing of migrations and production of a number of neotropical migratory bird species using systematic mist netting and banding,

2. conduct field studies of Olive-sided Flycatchers to gather information on singing behavior to evaluate survey methodology and compile basic natural history information including breeding biology and habitat selection.

STUDY AREAS

The migration study site is located on Creamer's Field Migratory Waterfowl Refuge in Fairbanks. It includes approximately 15 ha of boreal forest, shrub and wetland habitats.

In 1995-96 Olive-sided Flycatchers were studied in the greater Fairbanks area. Preliminary information was collected in 1994 near Glennallen and Fairbanks.

METHODS

CREAMER'S MIGRATION STUDY

In the migration study an array of 30-40 mist nets were used to capture birds. In spring, nets were opened from 25 April to 15 June. In fall, nets were opened between 15 July and 1 October. Nets were opened approximately 7 hours each day, usually from 0530-0715 (AST), but were opened earlier in June and July and later in September (in relation to changes in sunrise). We attempted to standardize effort at 12,000 net-hours in spring and 13,000-15,000 net-hours in fall. Birds were banded with standard aluminum leg bands, and we collected data on age, sex, wing chord, tail length, fat index, breeding condition and molt.

OLIVE-SIDED FLYCATCHER STUDY

In the Olive-sided Flycatcher study, a variety of information was collected. In 1994, 2 Breeding Bird Survey routes near Glennallen were run weekly from late May to early July to determine the seasonal variation in singing. In 1995 (and to a lesser degree in 1994 and 1996) we measured singing rates by observing males continuously for up to 5 hours and noting the number of songs uttered each minute on a data sheet. We rotated our observations of individual males to provide coverage at least once each 3-4 days, spanning the conventional survey period of 0300-0900 and additional coverage later in the day. We recorded additional information on calls and other vocalizations; perch site; feeding; interactions with females and other males and birds; weather; and other observations.

Detection distances were determined by one person maintaining visual contact with a singing male while 2 "detectors" walked directly away from the singing bird, stopping each 25-50m to listen as necessary. When they reached the distance where they could no longer hear the singing bird, they back-tracked slowly until it was audible. The two parties communicated via radios to insure the male was still singing from the initial site when the detectors reached their maximum detection distance. Distances were measured with a 100m tape.

Adults were captured in mist nets, attracted by tape recordings of songs and a wooden decoy. They were leg-banded with USFWS aluminum bands and unique combinations of colored bands, weighed, measured, and released. Young were banded with USFWS aluminum bands as nestlings.

Primary perches, those used for 10 minutes or more without interruption, or returned to 3 times or more during an observation period, were marked with flagging tape and mapped on copies of aerial photographs. Nest sites were located by closely observing females and males, and their locations were also mapped. Nests were monitored each 2-6 days to determine clutch size, hatching date, and fledging date, or other fate of nest. Additional locations of Olive-sideds were marked on copies of aerial photos throughout the field season to delineate "territories." At the end of the season, polygons encompassing all perch and nest sites of a given pair were drawn by hand. This "territory" was transferred to

1:24,000 scale topographic maps and digitized to determine the area of each territory. Distances between nests and perches were measured directly from the aerial photos.

Detailed vegetation data were collected at 2-4 primary perches used early in the nesting season per male, and at nests following the procedures of the BBIRD field protocol (Martin and Conway 1994) with a few changes. In a 5-m radius plot centered on the perch or nest tree, we estimated ground cover (<50 cm tall), noted predominate species, and counted shrub (50-140 cm tall) stems for each species. Within an 11.3 m-radius plot, we counted trees (>140 cm tall) within 4 diameter classes (>8 cm, 8-23 cm, 23-38 cm, >38 cm) by species and snags in 3 diameter classes. The height and diameter of the tallest tree in each of the 4 quadrants of the 11.3 plot was measured and species recorded. Canopy cover was measured with a "Densiometer" facing in each of the 4 cardinal directions from the perch or nest tree. The number of down dead trees (8 cm) was counted along two 22.5 m-transects centered at the perch or nest tree. Also noted were the aspect, slope, elevation, relative soil moisture, disturbances (fire, logging, wind throw, other), and distance to meadow (clearing), creek, river, pond, lake, and habitat edge. At perches and nests, we recorded the tree species, height and diameter and classified the tree as either live, live with dead top, or dead. At nests we recorded the height of the nest, distance of nest from trunk, overall length of nest branch, diameter of nest branch at base, and percent cover over nest.

RESULTS AND DISCUSSION

MIGRATION STUDY

Spring migration banding in 1995 and 1996 was conducted each year between April 25 and June 14-15. Nets were operated on 45 days (12,706 net hrs) in 1995 and 44 days (12,403 net hrs) in 1996. Total captures were very similar in the 2 years (Table 1). A total of 629 birds of 28 species were captured in spring 1995; 82% of the individuals and 75% of the species were Neotropical migrants (including Type A that winter primarily south of the U.S.A./Mexico border and Type B with some populations wintering south of the border). Of the 657 individuals and 33 species captured in spring 1996, 92% and 70%, repectively, were Neotropical migrants.

Capture rates in springs 1995 and 1996 were consistent with those observed in all previous years except 1992 (Table 2). Spring 1992 was exceptional, with low temperatures, late break-up, heavy snow in mid-May, and a late green-up.

Migration banding in falls 1995 and 1996 was conducted between 16-17 July and 29 September-2 October. Nets were opened on 58 days (14,122 net hrs) in fall 1995 and 57 days (14,997 net hrs) in 1996. The total number of birds captured in falls 1995 and 1996 were similar (Table 3). A total of 4369 birds of 34 species were captured in fall 1995; 79% of the individuals and 62% of the species were Neotropical migrants. In fall 1996, 4228 birds of 37 species were captured; 85% of the individuals and 65% of species were Neotropical migrants.

Fall 1995 and 1996 capture rates were similar and comparable to 1994 (Table 2) rates. Capture rates were notably higher in 1992, and lower in 1993. In 1992 an early snowfall occurred in mid-September and persisted; this affected both bird movements and operation of the migration station. In fall 1993, captures of hatch year birds (birds born that summer) were exceptionally low, while adults were captured at a rate similar to other years.

Olive-sided Flycatcher Study

This is an interim report on results from the Olive-sided Flycatcher study. All results reported here are preliminary and may change in final analysis and interpretation.

The Breeding Bird Survey (BBS) is the primary method of monitoring landbirds in North America. Initiated in 1965-66, the BBS now includes more than 3000 routes run annually continent-wide. In Alaska a few routes were surveyed in the late 1960s and 1970s, but it was not until 1982 that 25 or more routes were surveyed. With the growth of the Partners in Flight program in the early 1990s, the number of routes run annually in Alaska has increased to more than 70. If this level of effort is consistently applied for 10-20 years, it may be possible to monitor trends in numbers of Olive-sided Flycatchers in Alaska, especially in Central Alaska.

We examined the existing BBS data from Alaska to see how counts of Olive-sided Flycatchers varied yearly. Routes were selected for this analysis if they had been run consistently for several years and annual counts of Olive-sideds averaged 2.5/route or more annually. Fifteen routes met the selection criteria (Table 4). Counts on most routes were highly variable. Nearly 75% of the routes had coefficients of variation (CV; ie., standard deviation/mean) greater than 50%. On 9 Central routes the average coefficient of variation was 67%, in Southcoastal 3 routes averaged 59%, and in Southeast 3 routes averaged 56%. Frequently counts on individual routes ranged from a minimum of 0-2 to a maximum of 6-12 or more.

Several factors other than bird abundance may influence BBS counts, including observer ability and bias, survey date (any day within a 20-30 day count period is allowed), weather conditions, habitat change, road traffic levels, and noise. Singing behavior and other characteristics of individual bird species also affect detectability. The seasonal timing of arrival and singing, daily singing patterns, loudness and uniqueness of song, prominence of singing perches, size of breeding territory, vegetation structure, and other factors all influence detectability and the utility of survey methods such as the BBS and off-road point counts.

Seasonal Timing

In 1994 we repeatedly surveyed 2 established BBS routes near Glennallen to determine the seasonal variability of detections of Olive-sided Flycatchers and other selected Neotropical migrants. The Sourdough and Chistochina routes were each run 7 times between 18 May and 30 June. Detections of Olive-sideds were extremely variable, ranging from 0 to 11 on the Sourdough route, and 1 to 4 at Chistochina (Table 5). The highest count at Sourdough was recorded on 8 June and at Chistochina on 25 May. Peak numbers of the later arriving

Alder Flycatcher (*Empidonax alnorum*) were detected on 17 June at Sourdough and 29 June at Chistochina. The highest counts on the Sourdough route for Gray-cheeked Thrush (*Catharus minimus*), Swainson's Thrush (*C. ustulatus*) and Blackpoll Warbler (*Dendroica strata*) were tallied on 8 or 17 June; on the Chistochina route Gray-cheeked Thrushes were most abundant in the last half of June, Swainson's Thrush numbers climbed through 30 June, and Blackpoll Warbler detections peaked around the first half of June.

On 11 and 12 June 1994, the 2 routes were surveyed by the observer who had regularly done them in previous years; 10 Olive-sideds were detected on the Sourdough route and 4 on the Chistochina route (T. Doyle, USFWS, Tetlin NWR, pers commun). Over 7 years the mean number of Olive-sideds counted on the Sourdough route was 8.0 (s = 4.1; CV = 51%; range 1 to 14), and in 6 years on the Chistochina route, the mean was 4.7 Olive-sideds (s = 3.7; CV = 79%; range 0 to 11).

In 1995-96 we gathered detailed information on seasonal activities at 14 locations where Olive-sided were found in the Fairbanks area (Table 6). Additional information was collected in 1994 at 2 sites near Glennallen and 2 sites near Fairbanks.

In Fairbanks, the mean arrival date for males was 24-26 May, with nearly all males arriving before the 1st of June. The arrival dates for 1996 are most accurate because we began checking previous years' territories early in the season before the return of most males. In 1995 we were familiar with only 3 of the territories from experience in 1994 (mean arrival date of those three = 25 May 1995). In most cases the presence of males was detected by hearing their songs, and males generally sang regularly from first detection. However, in a few cases birds were found visually or by hearing just a few songs and were not heard singing regularly until 6 or more days later.

Territorial males sang at a consistent rate until they attracted a female (Fig. 1). Singing decreased dramatically for about a week following pairing, while the male escorted the female during nest building and the start of egg laying. At this point most males resumed singing at a new location 250-700m from the nest. If a nest failed, males reduced their singing rate while accompanying the female in renesting efforts, or resumed singing if they lost their mate. Males that did not attract a mate sang consistently through June and into July.

Daily Singing Pattern

Over the period of 25 May to 4 July Olive-sided Flycatchers sang at high rates (8-14 songs per minute) from 0215-0315 in the early morning, but singing rates decreased rapidly to an average of 2 songs per minute or less by 0515 and then remained at that level through late afternoon (1645) (Fig. 3). The proportion of silent 1-minute observation periods increased from less than 0.1 at 0245 rapidly to 0.35 by 0345 and then fluctuated between 0.4-0.6 from 0445 to 1645. However this overall pattern masks some marked differences observed in different stages of the breeding cycle and by paired and unpaired males.

As noted above, paired males reduced their singing rates during the period from the arrival of the female until egg laying was completed, and then resumed singing but at a lower rate

than prior to arrival of the female (Fig. 2). Unpaired males that maintained territories continued singing through June and into July at rates similar to those of paired males prior to arrival of females.

Establishment of Territories

Detection of a male in May or June did not guarantee a territory had been established for the nesting season. Not all males remained in areas where they were detected. Some males were detected singing on 1-2 dates in late May and early June, but were never found again at that location (Table 7). This occurred once in 1995 and 3 times in 1996 (and on several occasions in 1994 on the Sourdough and Chistochina BBS routes). Two other locations known as territories in 1995 were regularly examined from May through June 1996, but males were only detected singing once in mid-June of 1996. Some territories were established later in the season, where no singing males were detected in May or early June. In 1996, at 2 locations where territories were known from previous experience, no males were located until 6 June and 2 July (though we visited the sites repeatedly in May and June) and were found regularly thereafter. Overall, combining information from 1995 and 1996, of 23 males detected near Fairbanks, 6 (26%) were only found 1-2 times and did not maintain a territory through the breeding season. The remaining 17 (74%) were regularly found in the area where they were first detected.

Pairing on Established Territories

Of the 17 males that maintained territories in 1995-96, 3 (18%) never attracted a mate (Table 7). All of the failures to pair with a female were observed in 1995 (3 of 9 established territories, 33%). In 1996 all 8 males that maintained territories attracted a female.

Nesting, Renesting, and Nest Success

Only 1 of 14 pairs observed in 1995-96 failed to complete a nest and initiate laying (Table 7). Six (46%) of the 13 first nesting attempts successfully fledged at least one young. Five (62%) of 8 first nests were successful in 1996, but only 1 (20%) of 5 first attempts was successful in 1995. Three (43%) of the 7 pairs that failed in their first nest attempt renested; 2 of 4 in 1995, 1 of 3 in 1996. Two of these 3 renesting attempts were successful.

Site Fidelity

Three adults, 2 females and 1 male were color banded at the site of a successful nest near Glennallen in 1994. In 1995 the female associated with the 1994 nest returned to the same site but was paired with an unbanded male. No banded birds were observed at this site near Glennallen in 1996.

In 1995, 3 adult males on separate territories in Fairbanks were color banded. In 1996, 1 of these males returned to the same site where he was banded in 1995. Four additional adults, 3 males and 1 female, were banded near Fairbanks in 1996. We will visit these sites in May-June 1997 to determine whether the marked adults returned.

DETECTION DISTANCES

Two field assistants on this project were able to hear Olive-sideds singing at an average distance of 654m (n = 6 trials on separate dates; on 4 different territories; s = 159 m). The minimum detection distance was 504 m and the maximum was 828 m. All trials were in coniferous forest or woodland habitats in nearly level terrain.

TERRITORY DIMENSIONS

The area of 17 territories near Fairbanks in 1995-96 averaged 17.9 ha (s = 4.52; range 10.5-26.4). Most territories were long and narrow. The average maximum length was 572.9 m (a circle with area of 17.9 ha has a diameter of 477 m). In 4 renesting attempts, the second nest was placed an average of 186 m (range 110-300) from the first nest.

PERCH AND NEST SITES

Olive-sided Flycatcher territories were located within the Coniferous Forest and Scattered Woodland/Dwarf Forest habitat types of Kessel (1979). From 1994 to 1996 65 primary perches were identified early in the breeding season on 17 territories primarily from Fairbanks (some revisited every 2-3 years), including 5 in the Glennallen area. Ninety-one percent of the perch trees were spruce; 71% White Spruce (*Picea glauca*), 29% Black Spruce (*P. mariana*) and 9% were larch (*Larix laricina*). Throughout the course of the study, Olive-sideds were only rarely observed perching in deciduous trees. Fifty-one percent of the primary perches were "dead topped" (ranging from a minimum of the terminal meristem lacking needles to a large portion of the tree dead), 25% were completely dead, and 24% were "live" (needles present even on terminal meristem). Primary perches averaged 17.6 m tall (s = 4.94; range 6-30 m). Perches were generally prominent trees averaging 1.4 times taller than the surrounding forest canopy.

Eighteen of 19 nests were located in spruce trees. The nineteenth was in a larch. Fifteen were in Black Spruce, 2 in White spruce and 1 in an unidentified spruce. In contrast to perch trees, most nest trees were "live" trees. Eighty-one percent of nest trees were live and the remaining 29% were "dead topped." Nest trees were usually shorter (0.89 times) than the surrounding canopy and averaged 9.4 m tall (s = 3.72). Nest height averaged 6.4 m (s = 2.53; range 3-12 m) above the ground. On average, nests were placed 7/10ths up from the ground to the top of the nest tree (s = 0.13; range 0.4-0.9). Nests were placed 0 to 50 cm from the trunk atop live branches 20-100 cm long.

CONCLUSIONS AND RECOMMENDATIONS

The Creamer's migration monitoring project completed its 5th year in 1996. While this appears long-term relative to most biological field studies, it is still a fraction of the 10-20 years required for development of population trends in this type of long-term monitoring program. The Alaska Bird Observatory has grown and matured through the past 5 years, weathering major changes in staff and organization. It is now a stronger organization, more soundly based with a board of directors and several paid staff.

ACKNOWLEDGMENTS

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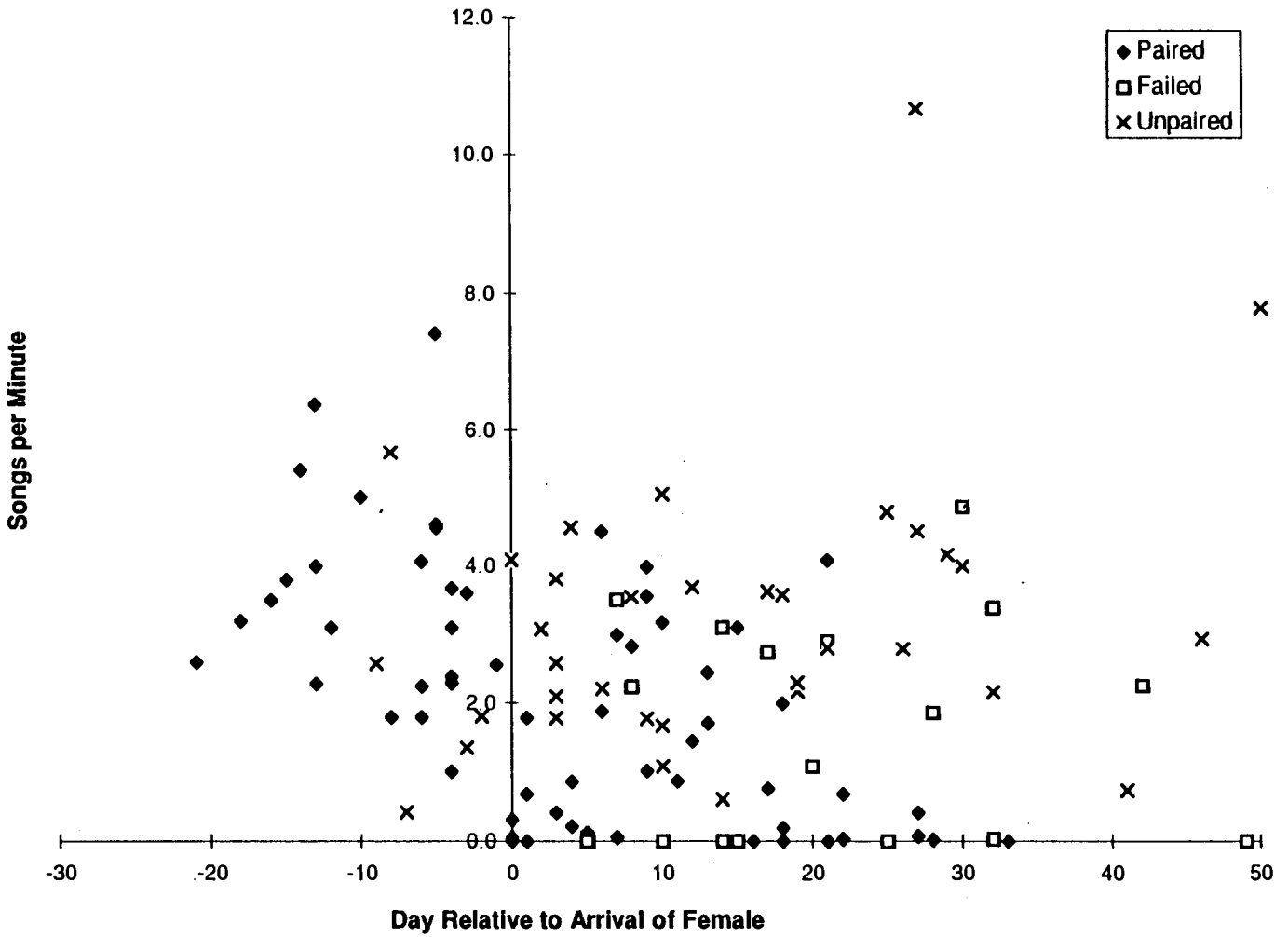


Fig. 1. Singing rate of Olive-sided Flycatchers relative to arrival date of females, 1994-96. Includes data collected 0200-1200 hours, 25 May-5 July. Average female arrival date used for unpaired males.

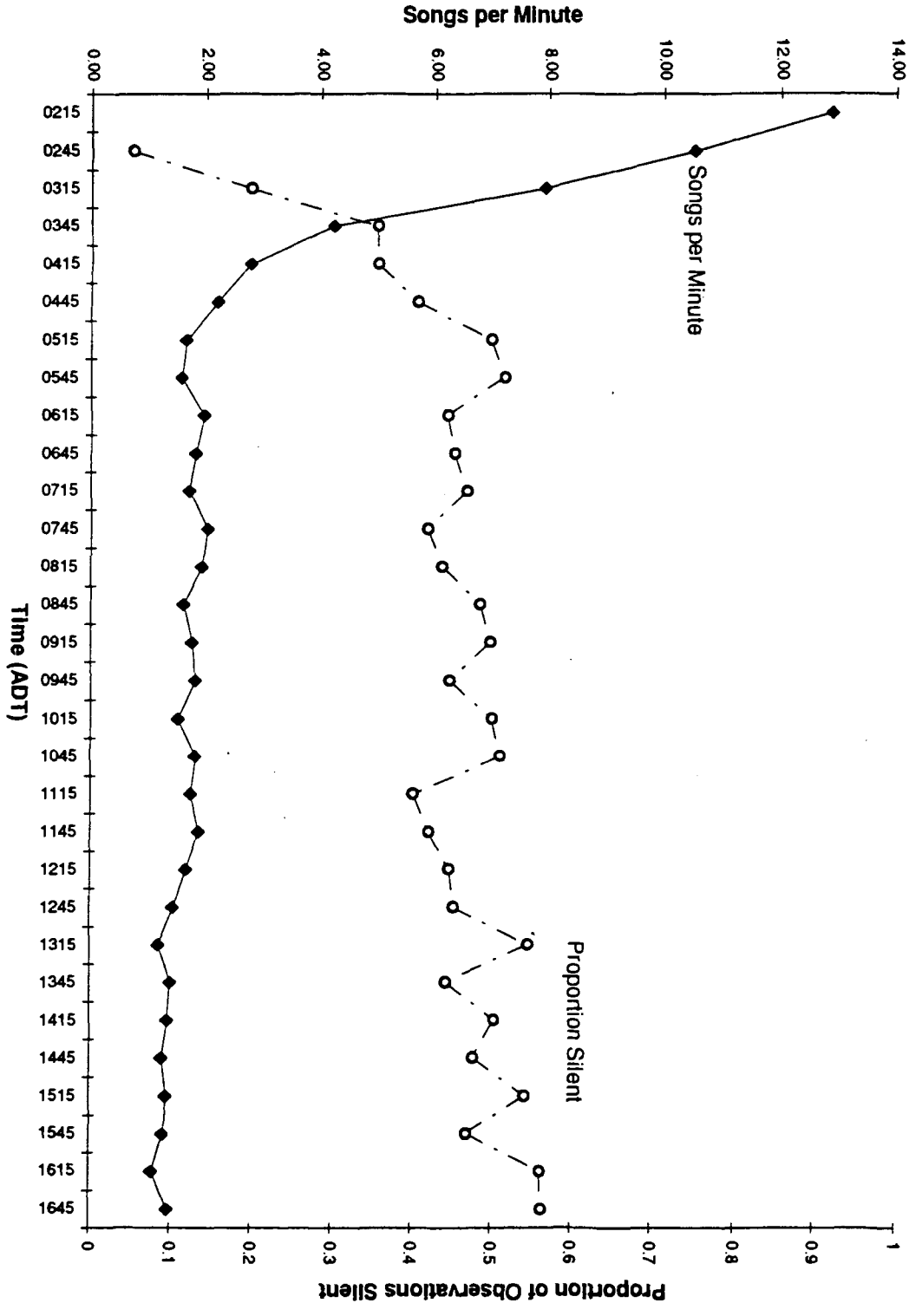


Fig. 2. Singing rate of Olive-sided Flycatchers from early morning to afternoon, 1994-96. Includes data from 25 May-4 July.

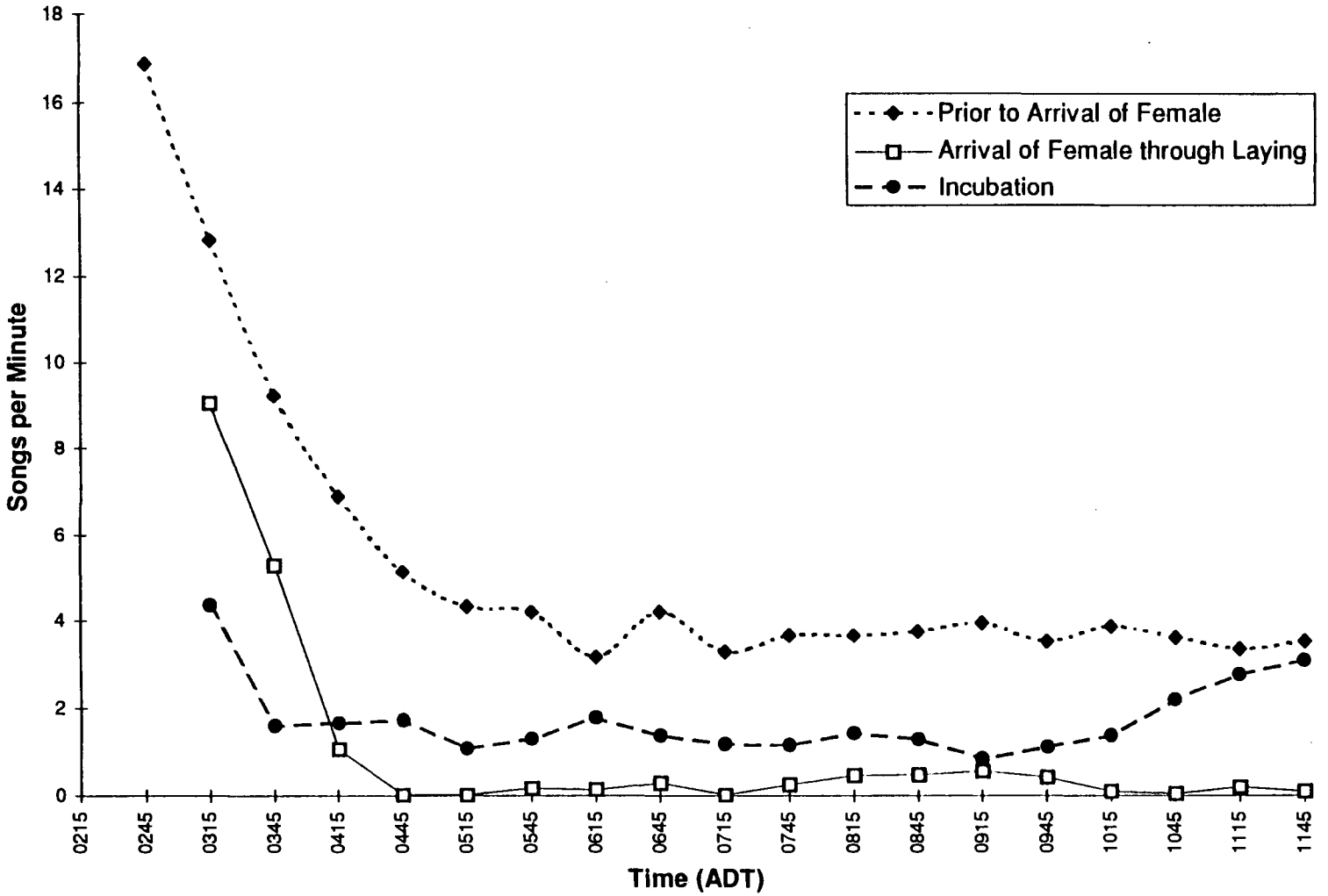


Fig. 3. Sing rates of paired Olive-sided Flycatcher males at 3 periods of the breeding cycle, 1994-96. Includes data from 16 May-1 July

Table 1. Numbers of birds captured at Creamer's Migration Station, Springs 1995-96.

Species	Winter*	1995	1996
Northern Pintail	B	1	
Sharp-shinned Hawk	B	1	3
Northern Goshawk	R		1
Lesser Yellowlegs	A		4
Solitary Sandpiper	A	2	5
Least Sandpiper	A		1
Downy Woodpecker	R	2	2
Three-toed Woodpecker	R		1
Northern Flicker	B	3	2
Alder Flycatcher	A	8	4
Hammond's Flycatcher	A	29	21
Tree Swallow	B	1	
Violet-green Swallow	A	1	1
Black-capped Chickadee	R	6	11
Boreal Chickadee	R		2
Arctic Warbler	P		1
Ruby-crowned Kinglet	B	7	7
Gray-cheeked Thrush	B	13	21
Swainson's Thrush	A	49	73
Hermit Thrush	B		4
American Robin	B	52	45
Varied Thrush	N	3	
Orange-crowned Warbler	A	53	36
Yellow Warbler	A	7	22
Yellow-rumped Warbler	B	86	86
Blackpoll Warbler	A		7
Northern Waterthrush	A	26	53
Wilson's Warbler	A	61	17
American Tree Sparrow	N	9	23
Savannah Sparrow	B	31	59
Fox Sparrow	B	9	9
Lincoln's Sparrow	A	23	14
White-crowned Sparrow	B	10	10
Dark-eyed Junco	B	42	101
Rusty Blackbird	N	3	1
Common Redpoll	N	91	10
TOTAL		629	657
Dates Nets Open		25 Apr-15 Jun	25 Apr-14 Jun
Number of Days		45	44
Net Hours		12,706	12,403

*Winter range/migration: A=primarily south of US/Mex. border; B=some south of US/Mex. border;P=Euasia/Africa; N=North America;

Table 2. Capture rates and numbers of individuals and species captured at Creamer's Migration Station in spring, 1992-1996.

		1992	1993	1994	1995	1996	TOTALS
Spring	Capture Rate	14.2	4.5	7.2	5.0	5.2	
	No. Individs.	952	472	803	629	657	3,513
	No. Species	27	28	30	28	33	43
Fall	Capture Rate	43.8	12.9	25.5	30.9	27.0	
	No. Individs.	2,654	1,749	3,553	4,369	4,228	16,553
	No. Species	33	30	32	36	37	48

Capture rate = No. birds caught/No. net hours

Table 3. Numbers of birds captured at Creamer's Migration Station, Falls 1995-96.

Species	Winter*	1995	1996
Northern Harrier	B		1
Sharp-shinned Hawk	B	3	8
Lesser Yellowlegs	A		1
Downy Woodpecker	R	2	2
Hairy Woodpecker	R	1	3
Northern Flicker	B		2
Alder Flycatcher	A	64	71
Hammond's Flycatcher	A	51	89
Tree Swallow	B	2	1
Gray Jay	R	1	1
Black-capped Chickadee	R	71	57
Boreal Chickadee	R	8	11
Red-breasted Nuthatch	R	2	1
Arctic Warbler	P	1	1
Golden-crowned Kinglet	B	1	
Ruby-crowned Kinglet	B	124	233
Gray-cheeked Thrush	A	48	16
Swainson's Thrush	A	178	89
Hermit Thrush	B	15	11
American Robin	B	34	85
Varied Thrush	N	1	11
Northern Shrike	N	2	2
Orange-crowned Warbler	A	868	463
Yellow Warbler	A	197	120
Yellow-rumped Warbler	B	588	1168
Townsend's Warbler	A	3	5
Palm Warbler	A	1	
Blackpoll Warbler	A	51	48
Northern Waterthrush	A	28	34
Wilson's Warbler	A	168	75
American Tree Sparrow	N	653	279
Savannah Sparrow	B	176	81
Fox Sparrow	B	30	37
Lincoln's Sparrow	A	369	230
Golden-crowned Sparrow	N		2
White-crowned Sparrow	B	45	121
Dark-eyed Junco	B	414	588
Rusty Blackbird	N		50
Common Redpoll	N	169	231
TOTAL		4369	4228
Dates Nets Open		17 Jul-2 Oct	16 Jul-29 Sep
Number of Days		58	57
Net Hours		14,122	14,997

*Winter range/migration: A=primarily south of US/Mex. border; B=some populations south of US/Mex. border;P=Euasia/Africa; N=North America; R=Resident

Table 4. Olive-sided Flycatcher counts on selected Alaska Breeding Bird Survey routes, 1982-1995.

Route	Region	No. Years	Mean	Std. Dev.	Coef. Var.	Min.	Max.
Eagle	Central	4	3.5	2.38	0.68	1	6
Circle	Central	7	4.0	2.45	0.61	2	8
Chatanika R	Central	4	5.0	1.41	0.28	4	7
Chistochina	Central	6	4.7	3.67	0.79	0	11
Northway	Central	7	2.9	1.21	0.43	1	4
Chena Hot Spr Rd	Central	7	2.4	3.10	1.28	0	9
Sourdough	Central	7	8.0	4.08	0.51	1	14
Bear Crk/Yukon	Central	7	9.4	6.97	0.74	2	24
Galena/Campion	Central	10	2.9	2.13	0.74	0	6
Swan Lake Road	Southcoastal	14	8.6	3.06	0.36	2	12
Anchor River	Southcoastal	9	2.9	1.96	0.68	0	7
Seven Lakes	Southcoastal	10	4.8	3.46	0.72	1	13
Mitkof Isl	Southeast	9	6.6	2.64	0.40	4	12
Zimovia Strt	Southeast	10	2.4	1.77	0.74	1	5
Zarembo	Southeast	3	6.7	3.51	0.53	3	10

Table 5. Number of Olive-sided Flycatchers and other selected neotropical migrants detected during repeated surveys of 2 Breeding Bird Survey routes near Glennallen, 1994.

	Sourdough					Chisotchina				
Date	OSFL	ALFL	GCTH	SWTH	BLPW	OSFL	ALFL	GCTH	SWTH	BLPW
18-19 May	2	0	0	0	0	1	0	0	2	0
28 May	0	1	14	20	0	4	1	6	23	1
1-2 June	0	2	39	35	0	1	6	9	47	2
8 June	11	12	59	50	1	1	22	1	46	0
16-17 June	6	15	43	67	2	2	44	17	73	2
23-24 June	2	13	24	44	0	1	60	10	76	1
29-30 June	1	4	22	44	0	1	67	15	107	1

OSFL= Olive-sided Flycatcher; ALFL=Alder Flycatcher; GCTH=Gray-cheeked Thrush; SWTH=Swainson's Thrush; BLPW=Blackpoll Warbler

Table 6. Timing of Olive-sided Flycatcher events in the vicinity of Fairbanks, AK. Includes observed and calculated dates, 1995-1996

	1995	1996
Male arrival	26 May (10)[1]	24 May (11)
	[22 May-1 Jun][2]	[11 May-8 Jun]
Female arrival	1 Jun (6)	2 Jun (7)
	[27 May-8 Jun]	[22 May-10 Jun]
Lay start	4 Jun (5)	12 Jun (7)
	[1-5 Jun]	[31 May-16 Jun]
Hatch start	29 Jun (2)	27 Jun (6)
	[22 Jun-7 Jul]	[16 Jun-2 Jul]
Fledge	none	15 Jul (4)
		[2 Jul-20 Jul]
Renest	(n = 2)	(n = 1)
Lay	11-19 Jun	10-12 Jul
Hatch	28 Jun-8 Jul	26-27 Jul
Fledge	12 Jul-23 Jul	4-Aug

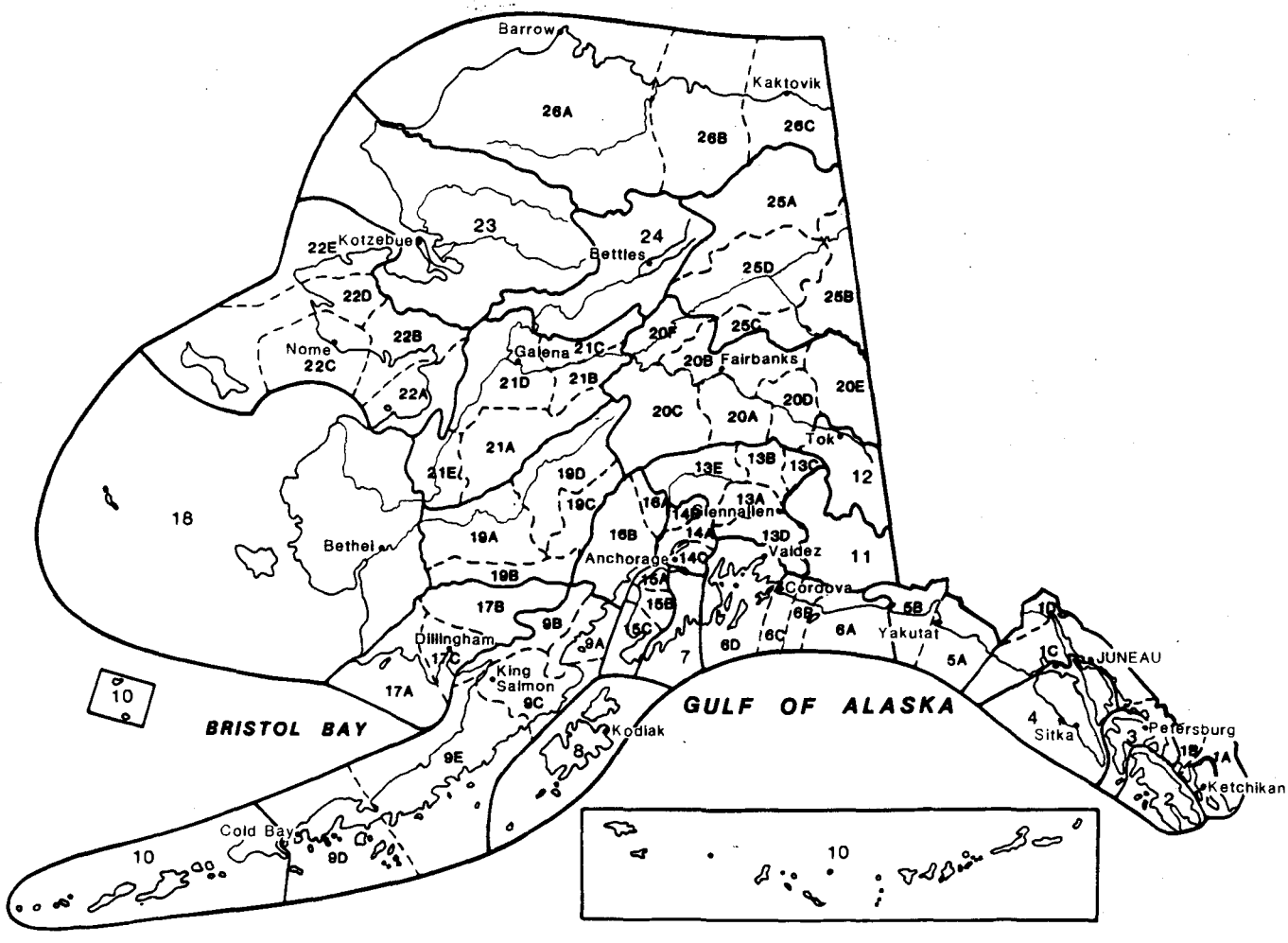
[1] parentheses = sample size

[2] brackets = range

Table 7. Fate of males found singing in Fairbanks area, 1995 and 1996.

Years	1995	1996
No. Males observed	10	13
Did not maintain territory	1	5
Never paired	3	0
Paired	6	8
Nested	5	8
1st nest fledged young	1	5
1st nest failed	4	3
Renested	2	1
Renest fledged young	1	1
Renest failed	1	0

Alaska's Game Management Units



The Federal Aid in Wildlife Restoration Program consists of funds from a 10% to 11% manufacturer's excise tax collected from the sales of handguns, sporting rifles, shotguns, ammunition, and archery equipment. The Federal Aid program allots funds back to states through a formula based on each state's geographic area and number of paid hunting license holders. Alaska receives a maximum 5% of revenues collected each year. The Alaska Department of Fish and Game uses federal aid funds to help restore, conserve, and manage wild birds and mammals to benefit the public. These funds are also used to educate hunters to develop the skills, knowledge, and attitudes for responsible hunting. Seventy-five percent of the funds for this report are from Federal Aid.

R H Armstrong