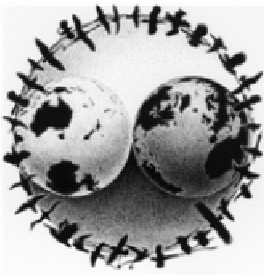
2006 REPORT OF THE MONITORING AVIAN PRODUCTIVITY AND SURVIVORSHIP (MAPS) PROGRAM IN DILLINGHAM, NOME, AND UMIAT, ALASKA



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27 February 2007

EXECUTIVE SUMMARY

The Monitoring Avian Productivity and Survivorship (MAPS) program was established by The Institute for Bird Populations (IBP) in 1989 to monitor landbirds in North America. MAPS utilizes constant-effort mist-netting and capture-recapture data to index or estimate a variety of population parameters. In 2006, we established and operated sixteen MAPS stations in Alaska. Five stations were established in southwestern Alaska near Dillingham; six were established on the Seward Peninsula outside of Nome (one of these six was only operated one day); and five were established on the North Slope near Umiat. Stations were sited specifically to target Arctic Warblers (part of a larger effort to sample landbirds for highly pathogenic avian influenza [HPAI]), although a variety of species were captured. Here, we summarize results of the first field season. Specifically, we report capture summaries for adult and young birds and reproductive indices (measured as the ratio of young to adult birds in the catch) for each species, location (Dillingham, Nome, and Umiat), and station.

We banded 4,139 birds and recorded 1,012 recaptures of 40 species at the three locations in 2006. The largest number of birds was banded at Nome (1,755 birds); the fewest were banded at Dillingham (1,121). Capture rate of adults was highest at Dillingham (335.9 birds per 600 net-hours), slightly lower at Nome (330.6 birds per 600 net-hours), and lowest at Umiat (259 birds per 600 net-hours). Capture rate of young was similar among locations, ranging from 191.7 at Nome to 202.6 at Umiat. The reproductive index (all species pooled) was highest at Umiat (0.78 compared to 0.58 and 0.60 for Nome and Dillingham, respectively). Capture rates were notably higher at the 2006 Alaska stations than at any other MAPS stations operated by IBP in 2006; they were also much higher than capture rates recorded at MAPS stations operated in Alaska and northwestern Canada in previous years.

Species diversity of captures was greatest at Dillingham (29 species; the most southerly location), and lowest at Umiat (16 species; the most northerly location). The five most commonly-captured species at Dillingham were (in descending order of importance) Orange-crowned Warbler, Swainson's Thrush, Arctic Warbler, Common Redpoll, and Wilson's Warbler. At Nome, the most commonly-captured species were Common Redpoll, Yellow Warbler, Hoary Redpoll, White-crowned Sparrow, and Gray-cheeked Thrush. At Umiat, the most commonly-captured species were American Tree Sparrow, Arctic Warbler, Gray-cheeked Thrush, and Common and Hoary Redpolls.

For species captured at more than one location, we found statistically-significant differences in capture rates of adults or young between (or among) locations for nine species. Among these, capture rates of adult and young Arctic Warblers and American Tree Sparrows were particularly high at Umiat compared to the other locations (American Tree Sparrows were not recorded at Dillingham). Adult capture rates of Northern Waterthrush, White-crowned Sparrow, and Common Redpoll were higher at Nome than at the other locations, and adult capture rates of Orange-crowned Warblers were significantly higher at Dillingham than at Nome (not recorded at Umiat). The capture rate of young Fox Sparrows was highest at Nome. Productivity was significantly highest at Dillingham for two species (Northern Waterthrush and Common Redpoll), at Nome for four species (Gray-cheeked Thrush, Orange-crowned Warbler, American Tree Sparrow, and Golden-crowned Sparrow), and at Umiat for two species (Arctic Warbler and

Savannah Sparrow).

Despite having only one year of data, our MAPS study is providing new insights into remote Alaska landbird populations for which there are few published data. Our efforts represent the first attempts to gather baseline demographic information on these populations. The collection of additional years of data will enable us to estimate and model adult apparent survival rates and population growth rates (minimum 3-4 years of data needed), as well as to identify the extent of temporal and spatial variation in productivity. Such data can form an integral component of efforts to meet bird monitoring and conservation goals in Alaska.

INTRODUCTION

Birds are sensitive indicators of environmental quality and ecosystem health (Morrison 1986, Hutto 1998), and they are the focus of broad-scale monitoring efforts in North America. Major continental scale avian monitoring programs, such as the Breeding Bird Survey (BBS) provide invaluable data on spatial and temporal variation in bird abundances and population trends (Rich et al. 2004). Yet the metrics monitored by the BBS – abundance and trend – are of limited use to conservationists and land managers because they cannot unambiguously distinguish the relative importance of different parts of the life cycle (which can be effected in geographically-disjunct areas), geographic regions, habitat types, or habitat features in driving population changes (DeSante and Rosenberg 1998).

Abundance and trend may not always be the best metrics for guiding management and conservation for a variety of reasons (Van Horne 1983). First, source-sink dynamics (Pulliam 1988) deriving from ecological or evolutionary traps could result in high abundance in low-quality (sink) habitats (Donovan et al. 1995, Donovan and Thompson 2001, Schlaepfer et al. 2002). Additionally, territorial exclusion by dominant individuals could lead to subordinates aggregating in high abundance in low quality habitats (Fretwell and Lucas 1970). The link between abundance of migratory species and habitat quality is further complicated by the possibility that populations are limited by processes acting at times other than when abundance is measured (e.g., abundance monitored on the breeding grounds; but limiting factors acting on the wintering grounds; Marra et al. 1998, Nott et al. 2002). Clearly, monitoring a broader suite of population parameters than just abundance and trend, particularly demographic rates (survival, reproduction, recruitment), will be needed to effectively manage habitats and conserve bird populations (DeSante et al. 2005).

Advantages of "demographic monitoring" are manifold. First, demographic monitoring emphasizes processes, rather than the resulting patterns. Because it is the process (demographic rate), not the pattern (abundance), that is directly affected by environmental factors (e.g., stressors or management actions), changes in vital rates will more accurately (and more sensitively) reflect short-term and local environmental changes (Temple and Wiens 1989, DeSante and George 1994). Additionally, information on demographic rates can lend insight into the stages of the life cycle that are most important for limiting bird populations, particularly for migratory species (Sherry and Holmes 1995, Green 1999, Peach et al. 1999, DeSante et al. 2001). Finally, demographic rates can be modeled as functions of environmental variables (e.g., land uses, habitat, climate; DeSante et al. 2005), and these relationships can be incorporated into

predictive population models to assess the viability of populations (Noon and Sauer 1992). In short, demographic monitoring not only complements abundance monitoring, but it can provide more insightful and timely information for conservation and management applications.

Application of standardized constant-effort mist netting and modern capture-recapture analytical techniques (Pollock et al. 1990, Lebreton et al. 1992) can be an effective means of monitoring demographic rates of many landbird species at multiple spatial scales (DeSante et al. 2004, Peach et al. 2004). Such an effort was initiated in North America by The Institute for Bird Populations (IBP) in 1989 with the establishment of the Monitoring Avian Productivity and Survivorship (MAPS) program (DeSante 1992). Prior to 2006, 36 MAPS stations had been established and operated in Alaska; yet none were still in operation as of 2006. In an effort to re-establish MAPS in Alaska and to obtain baseline demographic data for landbird species in remote and little-studied areas of the state, 23 MAPS stations were established at five locations in 2006. This effort was part of a larger project aimed at sampling landbirds for highly pathogenic avian influenza (HPAI); results of influenza sampling have been reported elsewhere (Saracco and DeSante 2006). Here we report first-year results for 16 of these MAPS stations that were operated by IBP at three locations near Dillingham, Nome, and Umiat. Specifically, we report capture summaries of adult and young birds and reproductive indices (productivity) for each location and station. In addition, we compared indices of abundance (capture rates) and productivity among the three locations.

The MAPS Program

In 1989 The Institute for Bird Populations (IBP) established the Monitoring Avian Productivity and Survivorship (MAPS) program, a cooperative effort among public agencies, private organizations, and individual bird banders in North America. MAPS has since grown into a continent-wide network of over 500 constant-effort mist-netting and banding stations that provide long-term demographic data on landbirds (DeSante et al. 1995, 2004, DeSante and Kaschube 2007). The design of the MAPS program was patterned after the successful British Constant Effort Sites (CES) Scheme that has been coordinated by the British Trust for Ornithology since 1981 (Peach et al. 1996). The MAPS program was endorsed in 1991 by the Monitoring Working Group of Partners in Flight (PIF) and the USDI Bird Banding Laboratory, and has subsequently attracted participation from many federal agencies, including the National Park Service, Department of Defense, Department of the Navy, Department of the Army, Texas Army National Guard, USDA Forest Service, and USDI Fish and Wildlife Service. For example, within the past 10 years, IBP has been contracted to operate as many as 157 MAPS stations per year on federally managed lands. Demographic indices or estimates derived from MAPS are consistent with data collected via other methods (e.g., Bart et al. 1999, DeSante et al. 1999) and with patterns predicted by ecological and life-history theory (DeSante 2000). MAPS data have been used to identify proximate causes of population change (e.g., DeSante et al. 2001) and environmental factors that drive demographic rates (e.g., Nott et al. 2002, 2003).

The MAPS Program is organized to fulfill three sets of goals and objectives: monitoring, research, and management:

- *Monitoring goals.* For over 100 target landbird species, MAPS aims to provide: (a)

annual indices of adult population size and post-fledging productivity (from constant-effort capture data); and (b) annual estimates of adult population size, adult survival rates, proportions of residents, and recruitment into the adult population (from capture-recapture data).

- *Research goals*. MAPS aims to identify and describe: (a) temporal and spatial patterns in demographic indices and estimates at a variety of spatial scales (from the local landscape to the entire continent); and (b) relationships between these patterns and ecological characteristics of the target species, population trends of target species, station-specific and landscape-level habitat characteristics, and spatially-explicit weather variables.

- *Management goals*. MAPS aims to use patterns in demographic rates and relationships between demographic rates and population trends and weather/habitat variables to: (a) identify demographic thresholds and trigger points to notify appropriate agencies and organizations of the need for further research and/or management actions; (b) determine proximate demographic cause(s) of population change; (c) suggest management actions and conservation strategies to reverse population declines and maintain stable or increasing populations; and (d) evaluate the effectiveness of implemented management actions and conservation strategies through an adaptive management framework.

STUDY AREAS AND METHODS

Sixteen MAPS stations were established and operated by IBP at three locations in Alaska in 2006 (Fig. 1; Table 1). Five stations were operated near Dillingham in southwestern Alaska, six stations were operated on the Seward Peninsula outside of Nome (one of these, "Boneyard" was operated for only one period, and is unlikely to be operated in the future), and five stations were operated on the North Slope near Umiat (Table 1). Each MAPS station was sited to capture large numbers of our target species for HPAI monitoring, Arctic Warbler. One of the six Nome stations, "Boneyard", was discontinued after one period of operation, as it was established prior to the spring return of Arctic Warblers, and no Arctic Warbler territories were established on the site. All stations were operated according to standardized protocols established by The Institute for Bird Populations for use by the MAPS Program (DeSante et al. 2006). On each day of operation, one 12-m long, 30-mm mesh, 4-tier nylon mist net was erected at each of 10 fixed mist-netting sites within the interior 8 ha of each 20-ha station. We aimed to operate nets for six morning hours per day (beginning at 05:30 AST), and for one day in each of six consecutive 10-day periods between 10 June and August 9. Inclement weather and logistical constraints (partly due to effort devoted to target-netting Arctic Warblers), however, resulted in variable effort among locations (Table 1). Overall, 1,261 net-hours, 1,421 net-hours, and 1,648 net-hours were completed at the Dillingham, Nome, and Umiat stations, respectively. Station operation was carried out by IBP field biologists N. Banfield, E. Sherrill, and V. Sepulveda and field interns J. Whatton, M. Wolfe, and V. Patrek. Training was conducted in Fairbanks by J. Saracco, V. Sepulveda, and staff of the Alaska Bird Observatory.

With few exceptions, all birds captured during the course of the study were identified to species, age, and sex and, if unbanded, were banded with USGS/BRD numbered aluminum leg bands.

Birds were released immediately upon capture and before being banded or processed if situations arose where bird safety would be compromised. The following data were taken on all birds captured, including recaptures, according to MAPS guidelines using standardized codes and forms (DeSante et al. 2006):

(1) capture code (newly banded, recaptured, band changed, unbanded);
(2) band number;
(3) species;
(4) age and how aged;
(5) sex (if possible) and how sexed (if applicable);
(6) extent of skull pneumaticization;
(7) breeding condition of adults (i.e., extent of cloacal protuberance or brood patch);
(8) extent of juvenal plumage in young birds;
(9) extent of body and flight-feather molt;
(10) extent of primary-feather wear;
(11) presence of molt limits and plumage characteristics;
(12) wing chord;
(13) fat class and body mass;
(14) date and time of capture (net-run time);
(15) station and net site where captured; and
(16) any pertinent notes.

Mist-netting effort data (i.e., the number and timing of net-hours on each day of operation) were collected in a standardized manner. Specifically, we recorded the time (to the nearest 10 min.) of opening and closing of the mist net array, as well as the time at which each net check was started. Breeding (summer residency) status (confirmed breeder, likely breeder, non-breeder) of each species seen, heard, or captured at each MAPS station on each day of operation was recorded using techniques similar to those employed for breeding bird atlas projects. We used these data to classify each species at each station according to three residency categories: breeder, migrant, or transient (see Appendices I-III). Habitat data were collected following Nott et al. (2003a), and using the vegetation classification system of Viereck et al. (1992). John W. Shipman of Zoological Data Processing, Socorro, NM entered banding data. IBP biologists entered effort data and proofed and verified digitized banding data. Verification of banding data involved running all records through a series of specialized computer programs. These programs included:

(1) Clean-up programs to check the validity of all codes entered and the ranges of all numerical data;
(2) Cross-check programs to compare station, date, and net fields from the banding data with those from the effort and breeding status data;
(3) Cross-check programs to compare species, age, and sex determinations against degree of skull pneumaticization, breeding condition (extent of cloacal protuberance and brood patch), extent of juvenal plumage, extent of body and flight-feather molt, extent of primary-feather wear, and presence of molt limits and plumage characteristics;
(4) Screening programs which allow identification of unusual or duplicate band numbers or unusual band sizes for each species; and

(5) Verification programs to screen banding and recapture data from all years of operation for inconsistent species, age, or sex determinations for each band number.

Discrepancies or suspicious data identified by these programs were examined and corrected if necessary. Wing chord, body mass, fat content, date and station of capture, and pertinent notes were used in the verification process as supplementary information for the correct determination of species, age, and sex.

For each species and for all species pooled at each location, we calculated (1) numbers of newly banded birds, recaptured birds, and birds released unbanded; (2) numbers and capture rates (per 600 net-hours) of first captures (in each year) for individual adult and young birds; and (3) the ratio of young to adult birds ("reproductive index"; Peach et al. 1996). For species captured at multiple locations (and at ≥ 2 stations at each location), we compared (1) and (2) using one-way ANOVAs (stations as replicates) and (3) with a chi-square test (specifically, testing whether the probability of a captured bird being young differed among locations) using JMP for Windows v. 5.0 (SAS Institute 2002). Nome station "Boneyard", which was operated in only one period, was excluded from these location comparisons.

RESULTS

We banded 4,139 birds of 40 species as part of the operation of the 16 Alaska MAPS stations in 2006. An additional 309 individuals were captured and released unbanded (typically during pulses of very high capture rates). We recorded 1,012 recaptures. Breakdown of captures by station and location, and captures adjusted for netting effort, are reported in Tables 2-10. We briefly summarize location-scale results here. The largest number of captures was recorded at Nome (Tables 3, 9), followed by Umiat (Tables 4, 10) and Dillingham (Tables 2, 8). Ordering of stations by capture rates, however, differed from this pattern; capture rate of adults (all species pooled) was highest at Dillingham and lowest at Umiat (Tables 8-10). Capture rate of young was highest at Umiat and Dillingham, and slightly lower at Nome. The reproductive index (for all species pooled) was higher at Umiat (0.78) than at Nome or Dillingham, which were similar (0.60 and 0.58, respectively).

Species diversity of mist-net captures was greatest at Dillingham (the most southerly location; Tables 2, 8), intermediate at Nome (Tables 3, 9), and lowest at Umiat (Tables 4, 10). Species composition of captures differed somewhat among locations. The five most commonly-captured species at Dillingham were (in decreasing order) Orange-crowned Warbler, Swainson's Thrush, Arctic Warbler, Common Redpoll, and Wilson's Warbler (Table 8). At Nome, the most commonly-captured species (by far) was Common Redpoll, followed by Yellow Warbler, Hoary Redpoll, White-crowned Sparrow, and Gray-cheeked Thrush (Table 9). At Umiat, the most commonly-captured species were American Tree Sparrow and Arctic Warbler, followed by Gray-cheeked Thrush, Common and Hoary Redpolls (Table 10).

For species captured at more than one location (and at ≥ 2stations at each of the locations), we found statistically-significant ($P < 0.05$) differences in capture rates of adults between (or among) locations for eight species (Fig. 2), and in capture rates of young for three species (Fig. 3). Among these, capture rates of adult and young Arctic Warblers and American Tree Sparrows

were particularly high at Umiat compared to the other locations (American Tree Sparrows were not recorded at Dillingham). Adult capture rates of Northern Waterthrush, White-crowned Sparrow, and Common Redpoll were higher at Nome than at the other locations, and adult capture rates of Orange-crowned Warblers were significantly higher at Dillingham than at Nome (not recorded at Umiat). The capture rate of young Fox Sparrows was highest at Nome.

Statistically-significant differences in productivity among locations were found for eight species (reproductive index values reported in Tables 8-10). Among these, productivity was highest at Dillingham for two species (Northern Waterthrush [$\chi^2_2 = 8.7, P = 0.01$] and Common Redpoll [$\chi^2_2 = 113.9, P < 0.0001$]; at Nome for four species (Gray-cheeked Thrush [$\chi^2_1 = 6.1, P = 0.01$], Orange-crowned Warbler [$\chi^2_1 = 8.9, P < 0.01$], American Tree Sparrow [$\chi^2_1 = 6.1, P = 0.01$], and Golden-crowned Sparrow [$\chi^2_1 = 11.1, P < 0.001$]); and at Umiat for two species (Arctic Warbler [$\chi^2_2 = 9.7, P = 0.01$] and Savannah Sparrow [$\chi^2_2 = 19.6, P < 0.0001$]).

DISCUSSION

The sixteen MAPS stations in Dillingham, Nome, and Umiat reported on here were established primarily to target Arctic Warblers, a priority species for HPAI monitoring in Alaska. Based on capture rates of adults and young, Arctic Warblers were far more abundant in Umiat than in Dillingham or, especially, in Nome. Nevertheless, it is impossible to determine, at this point, the extent to which this pattern will hold between years. For example, it was a late spring in Nome, and cold temperatures into late June, may have caused arriving birds to bypass the Seward Peninsula for interior sites where the phenology of plants and insects had progressed further. Indeed, the absence of Arctic Warblers at sites where they had previously been recorded on BBS routes (P. Bente, unpublished data), as well as their absence from many apparently suitable riparian habitats, suggest that Arctic Warblers may have been especially scarce on the Seward Peninsula in 2006. Similar high (relative to Dillingham) reproductive index values for Arctic Warblers at Umiat and Nome suggest that these northerly sites provided quality breeding habitat for this species.

Although our Alaska MAPS stations were set up to sample Arctic Warblers, we sampled a large variety of landbird species during our first year of station operation. Among these were several species outside of their known breeding ranges (Kessel and Cade 1958; Pitelka 1974; Kessel 1989), including Gray Jay and Northern Waterthrush (Umiat), and Pine Siskin (Nome). Furthermore, we captured individuals of several species in breeding condition in areas where their breeding status is not well understood (e.g., Alder Flycatcher and Black-capped Chickadee on the Seward Peninsula; Kessel 1989). Community composition of the Dillingham stations reflected the boreal forest/taiga habitats in which they were established. Several species sampled in large numbers at the Dillingham stations are declining or are otherwise considered to be species of high conservation priority; these include Gray-cheeked Thrush (also a high-priority HPAI monitoring species; USFWS/USGS 2007), Varied Thrush, Blackpoll Warbler, and Golden-crowned Sparrow (Boreal Partners in Flight Working Group 1999, Sauer et al. 2005). The more northerly Nome and Umiat MAPS stations sampled species more typical of tundra and willow/riparian habitats. Many of these species, such as Hoary Redpoll, are also of high conservation priority (Boreal Partners in Flight Working Group 1999, Rich et al. 2004). High

priority species for HPAI monitoring were also banded at Nome and Umiat (Bluethroat, Gray-cheeked Thrush, Eastern Yellow Wagtail; USFWS/USGS 2007).

Overall capture rates were very high at the Alaska locations compared to MAPS stations in other regions. For example, capture rates of both adults and young at each Alaska location were higher than at any of the other 72 MAPS stations operated by IBP at 12 locations in 2006. Indeed, the mean capture rate of adults at the three MAPS locations was 2.7 × higher, and the mean capture rate of young was 3.8 × higher than mean capture rates at the 72 other IBP-operated MAPS stations in 2006. Furthermore, capture rates were also much higher than those recorded at other MAPS stations previously run in Alaska or north-western Canada (DeSante et al. 2003). These results suggests that the 2006 MAPS stations are well-situated for obtaining the sample sizes needed to monitor demographic rates of birds according to MAPS protocol.

Based on our analyses of capture rates of birds captured at more than one location, abundances of many species differed markedly among sites. As indicated above, Arctic Warblers were far more common at Umiat than they were elsewhere. Other species notably more common at Umiat included American Tree Sparrow, a species whose abundance is reported to be highly variable from year-to-year in this region (Kessel and Cade 1958). Interestingly, three adult Gray Jays (a common boreal forest species) were banded at Umiat, and at least one family group of Gray Jays was noted at the outset of the MAPS season. We are aware of few other records of this species at this latitude (Kessel and Cade 1958; Pitelka 1974). Clearly, the most abundant birds at the Nome stations were redpolls, particularly Common Redpoll, a finding that matches the report of Kessel (1989) of redpolls being the most numerous summer resident birds of shrub thickets of the Seward Peninsula. Only one species (aside from those that only occurred at Dillingham), Orange-crowned Warbler, was significantly more abundant at Dillingham than at the other locations (it was not recorded at Umiat).

Reproductive index values were, overall, higher at Umiat than at Dillingham or Nome. Interestingly, however, among species shared between at least two locations, more species appeared to have higher productivity (4 species) at Nome than at Umiat or Dillingham (2 species each). We look forward to the potential opportunity to collect additional years of data in order to examine the temporal consistency of productivity patterns.

CONCLUSIONS

Despite having only one year of data, our MAPS study is providing important insights into Alaska landbirds. There are few published data on landbirds in these regions (Kessel and Cade 1958; Kessel and Gibson 1978, Kessel 1989), and our efforts represent the first attempts to gather baseline demographic data for these populations. The collection of additional years of data will enable us to estimate and model adult apparent survival rates and population growth rates (minimum 3-4 years of data needed), as well as to identify the extent of temporal and spatial variation in productivity. Such data can form an integral component of efforts to meet bird monitoring and conservation goals in Alaska.

ACKNOWLEDGEMENTS

This study was funded by the USFWS. We thank Nancy Dewitt, David Shaw, and other staff at Alaska Bird Observatory (ABO) for hosting our intern and biologist training session in Fairbanks during May 2006. ABO staff also provided excellent logistical support throughout the field season. We thank Steve Matsuoka for helpful conversations regarding study design, potential sampling areas, and field protocols. Avian influenza sampling was coordinated by Beth Pattinson and Deborah Rocque. Nathan Banfield, Ellen Sherrill, Andrew Spees, and Victor Sepulveda supervised field work. Victor also helped lead the training session in Fairbanks. Field biologist interns were Vicki Patrek, Ted Snyder, James Whatton, and Melissa Wolfe. Tom Heinlein provided logistical support in Nome. Peter Bente provided assistance with study area selection on the Seward Peninsula. Roy Ashenfelter of the Kawerak Lands Division in Nome provided information on land-use issues, and the Bering Straits, Sitnasauk, and Solomon Native Corporations granted permission to work on their lands. The staff of Taiga Ventures/Umiat Commercial provided a variety of services and logistical support in Umiat. Geoff Caroll (ADF&G); Richard Kemnitz, Debbie Nigro, and Dave Yokel (BLM); and Ted Swem (USFWS) provided logistical support and advice on working in Umiat. Geoff Caroll also graciously provided housing for the Umiat crew at the ADF&G Quonset hut. Rob MacDonald (USFWS) provided logistical support and helped select study areas near Dillingham. Togiak NWR provided housing for the Dillingham crew. Finally, we thank Rick Tennyson of Choggiung Limited for granting permission to work on their land near Dillingham. This is Contribution No. 315 of The Institute for Bird Populations.

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TABLE 1. Summary of MAPS stations established and operated by The Institute for Bird Populations at three Alaska locations in 2006.

Station						Operation		
Name	**Code**	**No.**	**Habitat description**	**Latitude-longitude**	**Elev.(m)**	**Net-hours**	**No. periods**	**Dates**
Dillingham								
Two Meadows View	TWMV	17747	spruce-birch forest; tundra meadows	59°05'54"N, -158°35'23"W	98	260.5	5[1]	6/19 - 8/04
Dead Woodpecker Valley	DEWV	17744	spruce-birch forest with narrow tundra strip	59°10'49"N, -158°39'20"W	55	241.0	5[1]	6/14 - 7/31
Moose Paddle Creek	MOPC	17746	open spruce-birch forest with a willow riparian zone	59°12'12"N, -158°40'15"W	47	252.7	5[1]	6/18 - 8/02
Snake Lake	SLAK	17743	spruce-birch forest with alder patches bordered by tundra	59°10'29"N, -158°41'19"W	105	227.7	5[1]	6/13 - 7/30
Hill 364	H364	17745	open spruce-birch forest with willow patches; bog	59°10'09"N, -158°42'52"W	74	279.3	5[1]	6/17 - 8/01
Nome								
Solomon River	SOLO	17742	willow riparian shrubland along riverine gravel bar	64°34'44"N, -164°32'27"W	33	241.0	5[1]	6/21 - 8/04
Nome River A	NORA	17738	willow riparian shrubland mixed with grassy openings	64°39'09"N, -165°17'54"W	30	312.2	5[1]	6/12 - 7/28
Nome River B	NORB	17739	willow riparian shrubland mixed with grassy openings	64°39'57"N, -165°18'07"W	30	307.8	5[1]	6/15 - 7/31

Station						Operation		
Name	**Code**	**No.**	**Habitat description**	**Latitude-longitude**	**Elev.(m)**	**Net-hours**	**No. periods**	**Dates**
Boneyard[2]	BOYA	17748	disturbed willow patches around ponds crossed with several dirt roads	64°32'27"N, -165°25'25"W	17	90.0	1	6/14
Snake River	SNRI	17741	willow riparian shrubland mixed with grassy openings	64°37'32"N,-165°27'33"W	30	230.8	5[1]	6/19 - 8/03
Penny River	PERI	17740	willow riparian shrubland bordered by tundra	64°35'07"N, -165°40'15"W	30	239.3	5[1]	6/17 - 8/02
Umiat								
East Umiat Mountain	EUMN	17733	willow/alder riparian	69°22'56"N, -151°58'19"W	79	250.0	4	7/01 - 7/30
West Umiat Mountain	WUMN	17734	willow riparian with scattered gravel deposits	69°22'50"N, -152°01'31"W	79	262.0	4	6/29 - 7/29
River Road	RIRO	17735	willow/alder riparian mixed with grassy fields	69°21'52"N, -152°07'07"W	81	440.8	6	6/13 - 8/01
South Bank	SOBA	17736	willow riparian mixed with fields of forbs and mixed herbaceous cover	69°21'11"N, -152°07'15"W	84	424.7	6	6/19 - 8/02
West of Landing Field	WELF	17737	willow riparian	69°19'40"N, -152°16'18"W	114	270.2	4	6/25 - 7/27

[1] Period seven was not operated at this location so target netting could occur during this period.

[2] This station was only operated for 1 period and was then discontinued. It is not planned for future operations.

TABLE 2. Capture summary for the five MAPS stations operated near Dillingham, Alaska in 2006. N = Newly Banded, U = Unbanded, R = Recaptures.

	Two Meadows View			Dead Woodpecker Valley			Moose Paddle Creek			Snake Lake			Hill 364		
Species	**N**	**U**	**R**	**N**	**U**	**R**	**N**	**U**	**R**	**N**	**U**	**R**	**N**	**U**	**R**
American Three-toed Woodpecker	2	0	0	6	1	0	2	0	0	1	0	0	1	0	0
Alder Flycatcher							15	2	4	5	0	2	9	0	1
Gray Jay	0	1	0	3	0	0				1	0	0	1	0	0
Black-capped Chickadee	1	1	0				5	1	1	1					
Boreal Chickadee	6	0	0	2	0	1	1	0	0						
Red-breasted Nuthatch	1	1	0	1	0	0	2	0	0						
Brown Creeper	3	3	0	1	0	0				2	0	0			
Ruby-crowned Kinglet	1	0	0	3	1	0	2	0	0	4	0	0	0	2	0
Arctic Warbler	44	0	13	24	1	5	22	2	5	13	1	5	10	0	3
Gray-cheeked Thrush							2	0	1	5	1	3	9	0	0
Swainson's Thrush	26	2	7	34	1	4	19	0	5	19	0	2	23	1	9
Hermit Thrush										1	0	0	2	0	0
American Robin	7	0	1	1	0	0	1	0	0	2	6	0	5	0	1
Varied Thrush	10	0	2	7	0	2	5	1	0	14	0	2	11	0	0
Orange-crowned Warbler	14	5	4	17		3	43	14	9	36	3	3	30	2	5
Yellow-rumped Warbler	22	5	0	12	0	1	3	1	0	9	0	3	10	1	0
Blackpoll Warbler	6	0	0	2	0	1	6	0	3	11	0	5	3	0	0
Northern Waterthrush	8	0	2	5	0	0	7	1	0	5	0	0	5	0	0
Wilson's Warbler	14	2	2	6	0	0	29	3	7	31	7	7	13	3	0
Savannah Sparrow	4	2	0	5	0	0				20	0	2	12	0	2
Fox Sparrow										6	0	1	2	0	0

	Two Meadows View			Dead Woodpecker Valley			Moose Paddle Creek			Snake Lake			Hill 364		
Species	**N**	**U**	**R**	**N**	**U**	**R**	**N**	**U**	**R**	**N**	**U**	**R**	**N**	**U**	**R**
Song Sparrow	1	0	0												
Lincoln's Sparrow	2	0	0	10	0	4	27	10	2	23	1	8	17	1	1
White-crowned Sparrow	12	1	3	2	0	0				9	0	1	4	1	2
Golden-crowned Sparrow	1	0	0	1	0	0	18	3	7	7	0	4	7	1	2
Dark-eyed Junco	11	2	3	16	1	2	4	0	0	12	0	3	12	0	4
Pine Grosbeak	9	0	0	2	0	0	1	0	0						
White-winged Crossbill	2	0	1	19	0	0	0	1	0				1	0	0
Common Redpoll	59	6	0	23	0	0	2	1	0	6	0	0	7	0	0
ALL SPECIES POOLED	**266**	**31**	**38**	**202**	**5**	**23**	**216**	**40**	**44**	**243**	**19**	**51**	**194**	**12**	**30**
Total Number of Captures		**335**			**230**			**300**			**313**			**236**	
Number of Species	**24**	**12**	**10**	**23**	**5**	**9**	**21**	**12**	**10**	**24**	**6**	**15**	**22**	**8**	**10**
Total Number of Species		**25**			**23**			**22**			**24**			**23**	

TABLE 3. Capture summary for the five MAPS stations operated near Nome, Alaska in 2006. N = Newly Banded, U = Unbanded, R = Recaptures.

	Solomon River			Nome River A			Nome River B			Boneyard			Snake River			Penny River		
Species	**N**	**U**	**R**	**N**	**U**	**R**	**N**	**U**	**R**	**N**	**U**	**R**	**N**	**U**	**R**	**N**	**U**	**R**
Alder Flycatcher	2	0	1							1	0	0						
Bank Swallow				1	0	0												
Black-capped Chickadee							1	0	0	2	0	1						
American Dipper																1	0	0
Arctic Warbler				9	0	3	21	0	13				22	0	13	13	1	5
Bluethroat				1	0	0							1	0	0			
Gray-cheeked Thrush	24	0	11	14	0	6	9	2	2	9	0	2	21	0	3	29	2	11
American Robin	0	1	0	7	0	0	3	0	0	3	0	0	1	0	0	15	1	1
Eastern Yellow Wagtail	6	0	0															
Orange-crowned Warbler	10	0	4	19	1	8	15	1	4				19	1	4	15	0	5
Yellow Warbler	33	2	7	21	0	16	26	0	10	23	0	8	19	0	3	38	5	19
Blackpoll Warbler	4	0	2	6	0	6	0	1	1	6	1	1	2	0	0	1	0	0
Northern Waterthrush	14	1	4	21	1	14	21	1	11	4	0	1	10	0	2	9	0	8
Wilson's Warbler	13	1	7	19	0	3	16	1	11	5	0	0	11	1	0	20	0	2
American Tree Sparrow	9	1	1	34	1	7	38	2	10	2	0	0	32	0	7	12	1	0
Savannah Sparrow	19	1	2	4	0	0	12	0	5				36	5	2	8	0	0
Fox Sparrow	18	0	4	23	0	11	14	0	4	3	1	2	20	3	3	39	1	9
White-crowned Sparrow	16	2	5	21	3	14	24	2	9	6	0	2	24	1	5	22	2	4
Golden-crowned Sparrow	2	0	1	1	1	1	1	0	0				2	0	0	12	3	3
Lapland Longspur	1	0	0															
Rusty Blackbird	1	0	0															
Common Redpoll	80	6	22	118	4	36	95	5	22	17	4	1	128	12	22	121	15	18

Species	Solomon River			Nome River A			Nome River B			Boneyard			Snake River			Penny River		
	N	**U**	**R**	**N**	**U**	**R**	**N**	**U**	**R**	**N**	**U**	**R**	**N**	**U**	**R**	**N**	**U**	**R**
Hoary Redpoll	16	0	4	27	0	22	15	2	7	4	0	0	18	0	2	23	1	7
Pine Siskin							1	0	0									
ALL SPECIES POOLED	**270**	**15**	**76**	**346**	**11**	**147**	**313**	**17**	**109**	**88**	**6**	**19**	**366**	**23**	**66**	**378**	**32**	**92**
Total Number of Captures		**361**			**504**			**439**			**113**			**455**			**502**	
Number of Species	**17**	**8**	**14**	**17**	**6**	**13**	**16**	**9**	**13**	**13**	**3**	**8**	**16**	**6**	**11**	**16**	**10**	**12**
Total Number of Species		**17**			**17**			**17**			**15**			**16**			**16**	

TABLE 4. Capture summary for the five MAPS stations operated near Umiat, Alaska in 2006. N = Newly Banded, U = Unbanded, R = Recaptures.

	East Umiat Mountain			West Umiat Mountain			River Road			South Bank			West of Landing Field		
Species	**N**	**U**	**R**	**N**	**U**	**R**	**N**	**U**	**R**	**N**	**U**	**R**	**N**	**U**	**R**
Northern Shrike							2	0	0	1	0	0			
Gray Jay	1						2	0	1						
Arctic Warbler	42	0	5	50	0	8	82	0	44	87	22	27	48	2	13
Bluethroat				1	0	0				3	0	0	0		
Gray-cheeked Thrush	29	0	10	23	1	12	9	0	2	23	2	15	21	0	7
American Robin	4	1	1	6	1	2	7	0	1	2	0	0	5	0	1
Eastern Yellow Wagtail				1	0	0				2	0	0	3	0	0
Yellow Warbler	15	0	2	8	0	1	7	0	0	17	5	3	22	0	6
Northern Waterthrush	6	0	0	1	0	0				1	3	0	1	0	0
Wilson's Warbler							3	0	0	1	0	0	2	0	0
American Tree Sparrow	64	0	9	72	0	18	106	1	33	88	37	20	47	2	15
Savannah Sparrow	2	0	0	5	0	0	11	0	0	15	10	0	2	0	0
Fox Sparrow	7	0	1	18	0	1	13	0	1	21	2	5	20	2	7
White-crowned Sparrow	9	2	3	6	0	2	12	0	0	14	1	9	23	0	7
Common Redpoll	16	0	2	15	2	4	21	0	1	10	0	3	30	0	2
Hoary Redpoll	9	0	1	14	0	3	11	0	0	23	2	6	21	0	5
ALL SPECIES POOLED	**210**	**3**	**34**	**221**	**4**	**51**	**286**	**1**	**83**	**309**	**87**	**88**	**246**	**6**	**63**
Total Number of Captures		**247**			**276**			**370**			**484**			**315**	
Number of Species	**12**	**2**	**9**	**13**	**3**	**9**	**13**	**1**	**7**	**15**	**9**	**8**	**13**	**3**	**9**
Total Number of Species		**12**			**13**			**13**			**15**			**13**	

TABLE 5. Numbers of adult and young birds captured per 600 net-hours and reproductive index (young/adult) at the five MAPS stations operated near Dillingham, Alaska in 2006.

	Two Meadows View			Dead Woodpecker Valley			Moose Paddle Creek			Snake Lake			Hill 364		
Species	**Ad.**	**Yg.**	**Repr. index**	**Ad.**	**Yg.**	**Repr. index**	**Ad.**	**Yg.**	**Repr. index**	**Ad.**	**Yg.**	**Repr. index**	**Ad.**	**Yg.**	**Repr. index**
American Three-toed Woodpecker	2.3	2.3	1.00	10.0	5.0	0.50	2.4	2.4	1.00	2.6	0.0	0.00	0.0	2.1	und.[1]
Alder Flycatcher							28.5	7.1	0.25	13.2	0.0	0.00	19.3	0.0	0.00
Gray Jay				0.0	7.5	und.[1]				0.0	2.6	und.[1]	0.0	2.1	und.
Black-capped Chickadee	0.0	2.3	und.[1]				4.7	7.1	1.50	0.0	2.6	und.[1]			
Boreal Chickadee	2.3	11.5	5.00	5.0	0.0	0.00	2.4	0.0	0.00						
Red-breasted Nuthatch	2.3	0.0	0.00	2.5	0.0	0.00	0.0	4.7	und.[1]						
Brown Creeper	0.0	6.9	und.[1]	2.5	0.0	0.00				0.0	5.3	und.[1]			
Ruby-crowned Kinglet	2.3	0.0	0.00	5.0	2.5	0.50	4.7	0.0	0.00	5.3	5.3	1.00	2.1	0.0	0.00
Arctic Warbler	53.0	50.7	0.96	52.3	10.0	0.19	28.5	26.1	0.92	34.3	2.6	0.08	21.5	0.0	0.00
Gray-cheeked Thrush							4.7	0.0	0.00	13.2	0.0	0.00	15.0	4.3	0.29
Swainson's Thrush	43.8	16.1	0.37	62.2	24.9	0.40	38.0	7.1	0.19	42.2	7.9	0.19	34.4	15.0	0.44
Hermit Thrush										2.6	0.0	0.00	4.3	0.0	0.00
American Robin	4.6	11.5	2.50	2.5	0.0	0.00	2.4	0.0	0.00	5.3	0.0	0.00	10.7	0.0	0.00
Varied Thrush	16.1	6.9	0.43	17.4	0.0	0.00	11.9	0.0	0.00	29.0	7.9	0.27	8.6	15.0	1.75
Orange-crowned Warbler	20.7	11.5	0.56	32.4	10.0	0.31	59.4	42.7	0.72	63.2	31.6	0.50	51.6	12.9	0.25
Yellow-rumped Warbler	20.7	29.9	1.44	22.4	7.5	0.33	7.1	0.0	0.00	13.2	10.5	0.80	15.0	6.4	0.43
Blackpoll Warbler	2.3	11.5	5.00	5.0	0.0	0.00	14.2	0.0	0.00	29.0	0.0	0.00	6.4	0.0	0.00
Northern Waterthrush	9.2	9.2	1.00	5.0	7.5	1.50	4.7	11.9	2.50	13.2	0.0	0.00	2.1	8.6	4.00
Wilson's Warbler	20.7	11.5	0.56	14.9	0.0	0.00	45.1	23.7	0.53	73.8	13.2	0.18	17.2	10.7	0.63

Species	Two Meadows View			Dead Woodpecker Valley			Moose Paddle Creek			Snake Lake			Hill 364		
	Ad.	Yg.	Repr. index	Ad.	Yg.	Repr. index	Ad.	Yg.	Repr. index	Ad.	Yg.	Repr. index	Ad.	Yg.	Repr. index
Savannah Sparrow	0.0	9.2	und.[1]	10.0	2.5	0.25				13.2	39.5	3.00	10.7	15.0	1.40
Fox Sparrow										10.5	5.3	0.50	2.1	2.1	1.00
Song Sparrow	2.3	0.0	0.00												
Lincoln's Sparrow	2.3	2.3	1.00	14.9	10.0	0.67	14.2	52.2	3.67	36.9	23.7	0.64	17.2	19.3	1.13
White-crowned Sparrow	20.7	6.9	0.33	2.5	2.5	1.00				13.2	10.5	0.80	8.6	0.0	0.00
Golden-crowned Sparrow	0.0	2.3	und.[1]	2.5	0.0	0.00	30.9	11.9	0.39	18.4	0.0	0.00	10.7	4.3	0.40
Dark-eyed Junco	11.5	13.8	1.20	32.4	7.5	0.23	4.7	4.7	1.00	13.2	18.4	1.40	15.0	10.7	0.71
Pine Grosbeak	16.1	4.6	0.29	2.5	2.5	1.00	2.4	0.0	0.00						
White-winged Crossbill	4.6	0.0	0.00	37.3	10.0	0.27							0.0	2.1	und.[1]
Common Redpoll	16.1	119.8	7.43	32.4	24.9	0.77	4.7	0.0	0.00	7.9	7.9	1.00	10.7	4.3	0.40
ALL SPECIES POOLED	**274.1**	**340.9**	**1.24**	**373.4**	**134.4**	**0.36**	**315.8**	**201.8**	**0.64**	**453.3**	**195.0**	**0.43**	**283.5**	**135.3**	**0.48**
Number of Species	**20**	**20**		**22**	**15**		**20**	**12**		**21**	**16**		**20**	**16**	
Total Number of Species		**24**			**23**			**21**			**24**			**23**	

[1] Reproductive index (young/adult) is undefined because no adults of this species were captured at this station in this year.

TABLE 6. Numbers of adult and young birds captured per 600 net-hours and reproductive index (young/adult) at the six MAPS stations operated near Nome, Alaska in 2006.

	Solomon River			Nome River A			Nome River B			Boneyard			Snake River			Penny River		
Species	**Ad.**	**Yg.**	**Repr. index**	**Ad.**	**Yg.**	**Repr. index**	**Ad.**	**Yg.**	**Repr. index**	**Ad.**	**Yg.**	**Repr. index**	**Ad.**	**Yg.**	**Repr. index**	**Ad.**	**Yg.**	**Repr. index**
Alder Flycatcher	7.5	0.0	0.0							6.7	0.0	0.00						
Bank Swallow				1.9	0.0	0.00												
Black-capped Chickadee							1.9	0.0	0.0	13.3	0.0	0.00						
American Dipper																2.5	0.0	0.00
Arctic Warbler				11.5	5.8	0.50	23.4	19.5	0.83				28.6	18.2	0.64	10.0	17.5	1.75
Bluethroat				1.9	0.0	0.00							2.6	0.0	0.00			
Gray-cheeked Thrush	19.9	22.4	1.13	17.3	1.9	0.11	9.7	1.9	0.20	60.0	0.0	0.00	18.2	13.0	0.71	30.1	27.6	0.92
American Robin				9.6	3.8	0.40	0.0	0.0	0.00	20.0	0.0	0.00	2.6	0.0	0.00	12.5	12.5	1.00
Eastern Yellow Wagtail	7.5	5.0	0.67															
Orange-crowned Warbler	5.0	7.5	1.50	13.5	23.1	1.71	5.8	11.7	2.00				26.0	7.8	0.30	10.0	15.0	1.50
Yellow Warbler	22.4	34.9	1.56	30.8	3.8	0.13	17.5	9.7	0.56	153.3	0.0	0.00	13.0	26.0	2.00	47.6	27.6	0.58
Blackpoll Warbler	5.0	0.0	0.00	7.7	1.9	0.25	1.9	0.0	0.00	40.0	0.0	0.00	0.0	5.2	und.[1]	2.5	0.0	0.00
Northern Waterthrush	19.9	5.0	0.25	19.2	9.6	0.50	17.5	7.8	0.44	26.7	0.0	0.00	13.0	0.0	0.00	15.0	2.5	0.17
Wilson's Warbler	12.4	10.0	0.80	11.5	17.3	1.50	19.5	9.7	0.50	33.3	0.0	0.00	10.4	0.0	0.00	22.6	12.5	0.56
American Tree Sparrow	5.0	12.4	2.50	17.3	30.8	1.78	15.6	35.1	2.25	13.3	0.0	0.00	13.0	46.8	3.60	7.5	17.5	2.33
Savannah Sparrow	0.0	34.9	und.[1]	1.9	1.9	1.00	3.9	11.7	3.00				10.4	49.4	4.75	5.0	10.0	2.00
Fox Sparrow	12.4	27.4	2.20	11.5	28.8	2.50	13.6	11.7	0.86	20.0	0.0	0.00	7.8	31.2	4.00	15.0	32.6	2.17
White-crowned Sparrow	19.9	12.4	0.63	23.1	15.4	0.67	27.3	15.6	0.57	40.0	0.0	0.00	31.2	23.4	0.75	17.5	35.1	2.00
Golden-crowned Sparrow	5.0	0.0	0.00	0.0	3.8	und.[1]	0.0	1.9	und.[1]				0.0	2.6	und.[1]	7.5	22.6	3.00
Lapland Longspur	2.5	0.0	0.00															

Species	Solomon River			Nome River A			Nome River B			Boneyard			Snake River			Penny River		
	Ad.	Yg.	Repr. index	Ad.	Yg.	Repr. index	Ad.	Yg.	Repr. index	Ad.	Yg.	Repr. index	Ad.	Yg.	Repr. index	Ad.	Yg.	Repr. index
Rusty Blackbird [2]	0.0	0.0	0.00															
Common Redpoll	132.0	27.4	0.21	99.9	42.3	0.42	95.5	15.6	0.16	113.3	0.0	0.00	158.6	39.0	0.25	92.8	7.5	0.08
Hoary Redpoll	34.9	0.0	0.00	38.4	0.0	0.00	13.6	0.0	0.00	26.7	0.0	0.00	33.8	2.6	0.08	40.1	0.0	0.00
ALL SPECIES POOLED	**311.3**	**199.2**	**0.66**	**317.1**	**190.3**	**0.60**	**267.0**	**152.0**	**0.57**	**566.7**	**0.0**	**0.00**	**369.1**	**265.1**	**0.72**	**338.4**	**240.7**	**0.71**
Number of Species	**14**	**11**		**16**	**14**		**13**	**12**		**11**	**0**		**14**	**12**		**16**	**13**	
Total Number of Species		**15**			**17**			**14**			**11**			**16**			**16**	

[1] Reproductive index (young/adult) is undefined because no adults of this species were captured at this station in this year.

[2] One unaged individual was captured.

TABLE 7. Numbers of adult and young birds captured per 600 net-hours and reproductive index (young/adult) at the five MAPS stations operated near Umiat, Alaska in 2006.

	East Umiat Mountain			West Umiat Mountain			River Road			South Bank			West of Landing Field		
Species	**Ad.**	**Yg.**	**Repr. index**	**Ad.**	**Yg.**	**Repr. index**	**Ad.**	**Yg.**	**Repr. index**	**Ad.**	**Yg.**	**Repr. index**	**Ad.**	**Yg.**	**Repr. index**
Northern Shrike							2.7	0.0	0.00	0.0	1.4	und.[1]			
Gray Jay	2.4	0.0	0.00				2.7	0.0	0.00						
Arctic Warbler	45.6	55.2	1.21	66.4	48.1	0.72	53.1	62.6	1.18	65.0	56.5	0.87	66.6	46.6	0.70
Bluethroat				0.0	2.3	und.[1]				2.8	1.4	0.50			
Gray-cheeked Thrush	50.4	19.2	0.38	48.1	6.9	0.14	9.5	2.7	0.29	24.0	8.5	0.35	44.4	2.2	0.05
American Robin	4.8	4.8	1.00	9.2	4.6	0.50	8.2	1.4	0.17	2.8	0.0	0.00	8.9	2.2	0.25
Eastern Yellow Wagtail				0.0	0.0	0.00				0.0	2.8	und.[1]	6.7	0.0	0.00
Yellow Warbler	19.2	16.8	0.88	16.0	2.3	0.14	1.4	8.2	6.00	15.5	8.5	0.54	33.3	15.5	0.47
Northern Waterthrush	4.8	7.2	1.50	0.0	2.3	und.[1]				5.7	0.0	0.00	2.2	0.0	0.00
Wilson's Warbler							2.7	1.4	0.50	1.4	0.0	0.00	4.4	0.0	0.00
American Tree Sparrow	67.2	86.4	1.29	55.0	109.9	2.00	74.9	72.1	0.96	57.9	69.2	1.20	40.0	64.4	1.61
Savannah Sparrow	0.0	4.8	und.[1]	0.0	9.2	und.[1]	0.0	15.0	und.[1]	0.0	21.2	und.[1]	0.0	4.4	und.[1]
Fox Sparrow	0.0	16.8	und.[1]	4.6	34.4	7.50	5.4	10.9	2.00	12.7	12.7	1.00	22.2	22.2	1.00
White-crowned Sparrow	16.8	4.8	0.29	9.2	4.6	0.50	4.1	12.3	3.00	18.4	1.4	0.08	22.2	31.1	1.40
Common Redpoll	36.0	2.4	0.07	34.4	0.0	0.00	25.9	2.7	0.11	12.7	1.4	0.11	55.5	11.1	0.20
Hoary Redpoll	19.2	2.4	0.13	29.8	2.3	0.08	12.3	2.7	0.22	32.5	0.0	0.00	42.2	4.4	0.11
ALL SPECIES POOLED	**261.6**	**213.6**	**0.82**	**272.5**	**224.4**	**0.82**	**202.8**	**191.9**	**0.95**	**245.8**	**185.1**	**0.75**	**346.4**	**204.3**	**0.59**
Number of Species	**9**	**10**		**9**	**10**		**12**	**11**		**11**	**11**		**11**	**10**	
Total Number of Species		**11**			**11**			**13**			**14**			**12**	

[1] Reproductive index (young/adult) is undefined because no adults of this species were captured at this station in this year.

TABLE 8. Summary of results for the five Dillingham MAPS stations combined in 2006.

Species	Birds captured			Birds/600 net-hours		Reprod. Index
	Newly banded	Un-banded	Recap-tured	Adults	Young	
American Three-toed Woodpecker	12	1	0	3.3	2.4	0.71
Alder Flycatcher	29	2	7	12.4	1.4	0.12
Gray Jay	5	1	0	0.0	2.4	und.[1]
Black-capped Chickadee	7	2	1	1.0	2.4	2.50
Boreal Chickadee	9	0	1	1.9	2.4	1.25
Red-breasted Nuthatch	4	1	0	1.0	1.0	1.00
Brown Creeper	6	3	0	0.5	2.4	5.00
Ruby-crowned Kinglet	10	3	0	3.8	1.4	0.38
Arctic Warbler	113	4	31	37.6	18.1	0.48
Gray-cheeked Thrush	16	1	4	6.7	1.0	0.14
Swainson's Thrush	121	4	27	43.8	14.3	0.33
Hermit Thrush	3	0	0	1.4	0.0	0.00
American Robin	16	6	2	5.2	2.4	0.46
Varied Thrush	47	1	6	16.2	6.2	0.38
Orange-crowned Warbler	140	24	24	45.2	21.4	0.47
Yellow-rumped Warbler	56	7	4	15.7	10.9	0.70
Blackpoll Warbler	28	0	9	10.9	2.4	0.22
Northern Waterthrush	30	1	2	6.7	7.6	1.14
Wilson's Warbler	93	15	16	33.3	11.9	0.36
Savannah Sparrow	41	2	4	6.7	12.8	1.93
Fox Sparrow	8	0	1	2.4	1.4	0.60
Song Sparrow	1	0	0	0.5	0.0	0.00
Lincoln's Sparrow	79	12	15	16.7	21.4	1.29
White-crowned Sparrow	27	2	6	9.0	3.8	0.42
Golden-crowned Sparrow	34	4	13	12.4	3.8	0.31
Dark-eyed Junco	55	3	12	15.2	10.9	0.72
Pine Grosbeak	12	0	0	4.3	1.4	0.33
White-winged Crossbill	22	1	1	8.1	2.4	0.29
Common Redpoll	97	7	0	14.3	31.9	2.23
ALL SPECIES POOLED	**1121**	**107**	**186**	**335.9**	**201.7**	**0.60**
Total Number of Captures		**1414**				
Number of Species	**29**	**23**	**20**	**28**	**27**	
Total Number of Species		**29**			**29**	

[1] Reprod. index (young/adult) undefined because no adults of this species were captured at this location in this year.

TABLE 9. Summary of results for the six Nome region MAPS stations combined in 2006.

Species	Birds captured			Birds/600 net-hours		Reprod. Index
	Newly banded	Un-banded	Recap-tured	Adults	Young	
Alder Flycatcher	3	0	1	1.3	0.0	0.00
Bank Swallow	1	0	0	0.4	0.0	0.00
Black-capped Chickadee	3	0	1	1.3	0.0	0.00
American Dipper	1	0	0	0.4	0.0	0.00
Arctic Warbler	65	1	34	13.5	11.4	0.84
Bluethroat	2	0	0	0.8	0.0	0.00
Gray-cheeked Thrush	106	4	35	21.1	11.4	0.54
American Robin	29	2	1	5.9	3.0	0.50
Eastern Yellow Wagtail	6	0	0	1.3	0.8	0.67
Orange-crowned Warbler	78	3	25	11.0	12.7	1.15
Yellow Warbler	160	7	63	34.2	17.7	0.52
Blackpoll Warbler	19	2	10	5.5	1.3	0.23
Northern Waterthrush	79	3	40	17.7	5.1	0.29
Wilson's Warbler	84	3	23	16.5	9.7	0.59
American Tree Sparrow	127	5	25	12.2	27.0	2.21
Savannah Sparrow	79	6	9	3.8	18.6	4.89
Fox Sparrow	117	5	33	12.7	24.1	1.90
White-crowned Sparrow	113	10	39	24.9	18.6	0.75
Golden-crowned Sparrow	18	4	5	2.1	5.1	2.40
Lapland Longspur	1	0	0	0.4	0.0	0.00
Rusty Blackbird [2]	1	0	0	0.0	0.0	und.[1]
Common Redpoll	559	46	121	112.3	24.9	0.22
Hoary Redpoll	103	3	42	31.2	0.4	0.01
Pine Siskin [3]	1	0	0			
ALL SPECIES POOLED	**1755**	**104**	**507**	**330.6**	**191.7**	**0.58**
Total Number of Captures		**2366**				
Number of Species	**24**	**15**	**17**	**20**	**16**	
Total Number of Species		**24**			**20**	

[1] Reprod. index (young/adult) undefined because no adults of this species were captured at this location in this year.

[2] One unaged individual was captured.

3 Species classified as ‘migrant’ a this location (see Appendix II).

TABLE 10. Summary of results for all five Umiat region MAPS stations combined in 2006.

Species	Birds captured			Birds/600 net-hours		Reprod. Index
	Newly banded	Un-banded	Recap-tured	Adults	Young	
Northern Shrike	3	0	0	0.7	0.4	0.50
Gray Jay	3	0	1	1.1	0.0	0.00
Arctic Warbler	309	24	97	59.0	55.0	0.93
Bluethroat	4	0	0	0.7	0.7	1.00
Gray-cheeked Thrush	105	3	46	31.0	7.3	0.24
American Robin	24	2	5	6.6	2.2	0.33
Eastern Yellow Wagtail	6	0	0	1.1	0.7	0.67
Yellow Warbler	69	5	12	15.3	9.8	0.64
Northern Waterthrush	9	3	0	3.5	2.0	0.57
Wilson's Warbler	6	0	0	1.8	0.4	0.20
American Tree Sparrow	377	40	95	60.4	78.3	1.30
Savannah Sparrow	35	10	0	0.0	12.4	und.[1]
Fox Sparrow	79	4	15	9.1	17.8	1.96
White-crowned Sparrow	64	3	21	13.1	10.2	0.78
Common Redpoll	92	2	12	30.2	3.3	0.11
Hoary Redpoll	78	2	15	26.2	2.2	0.08
ALL SPECIES POOLED	**1263**	**98**	**319**	**259.9**	**202.6**	**0.78**
Total Number of Captures		**1680**				
Number of Species	**16**	**11**	**10**	**14**	**14**	
Total Number of Species		**16**			**15**	

[1] Reprod. index (young/adult) undefined because no adults of this species were captured at this location in this year.

FIGURE 1. Locations of 16 MAPS stations (five each at Dillingham and Umiat; six at Nome) operated by The Institute for Bird Populations in 2006.

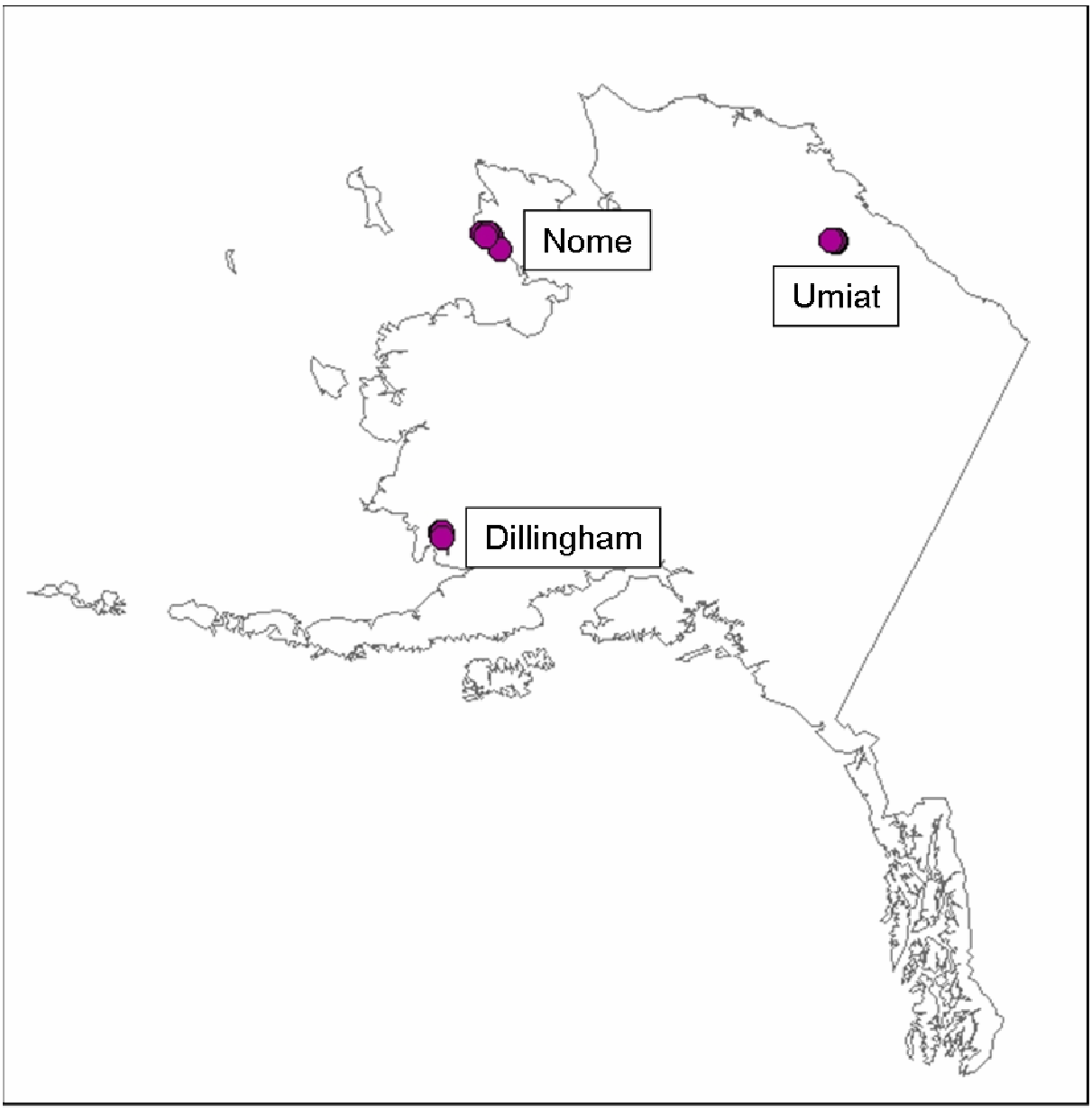


FIGURE 2. Mean (error bars = 1 SE) capture rate of young birds for species with significant ($P < 0.05$) differences between (or among) locations. For species captured at all three locations (either adult or young), significant differences among locations are indicated by different letters (based on Tukey's HSD test).

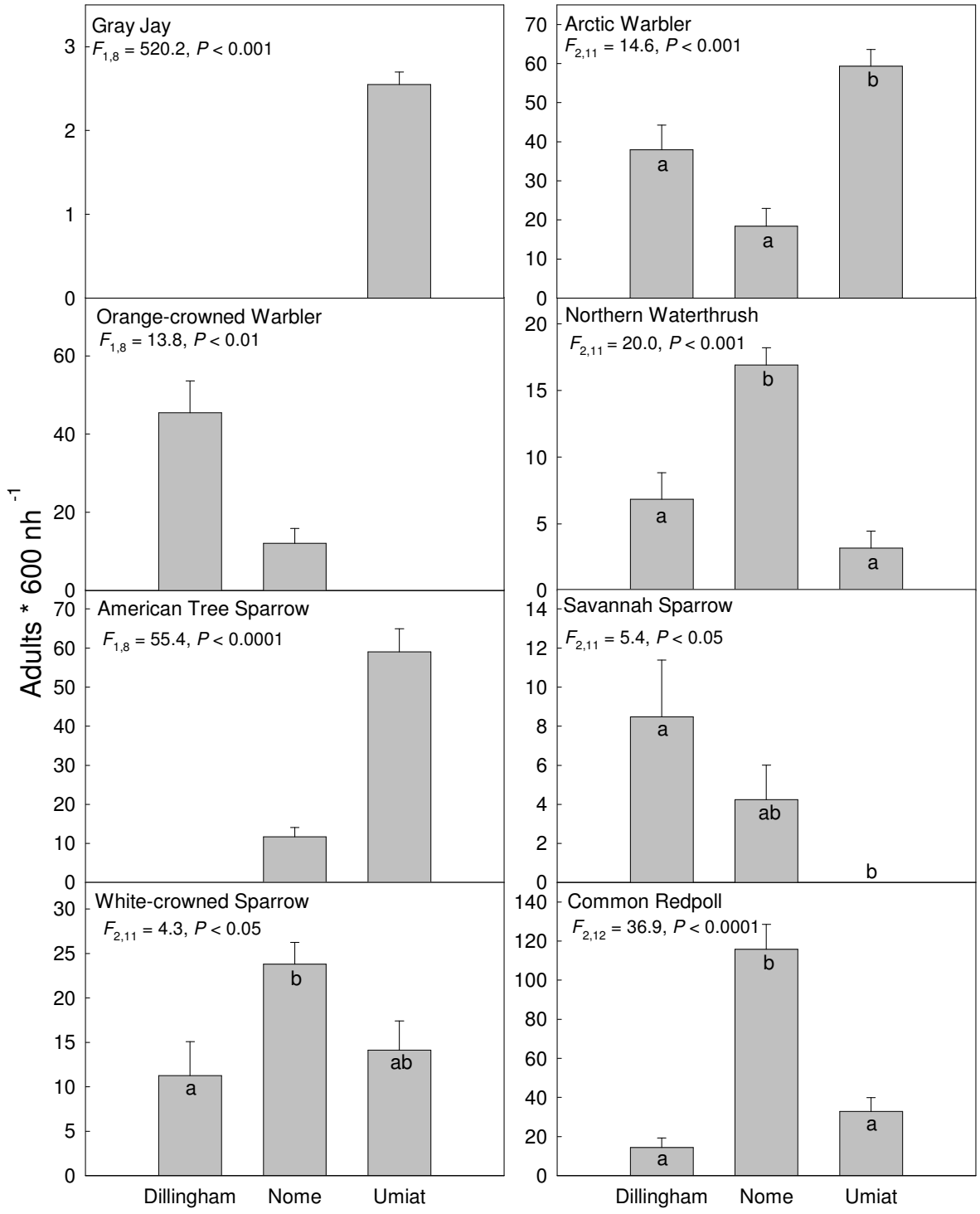
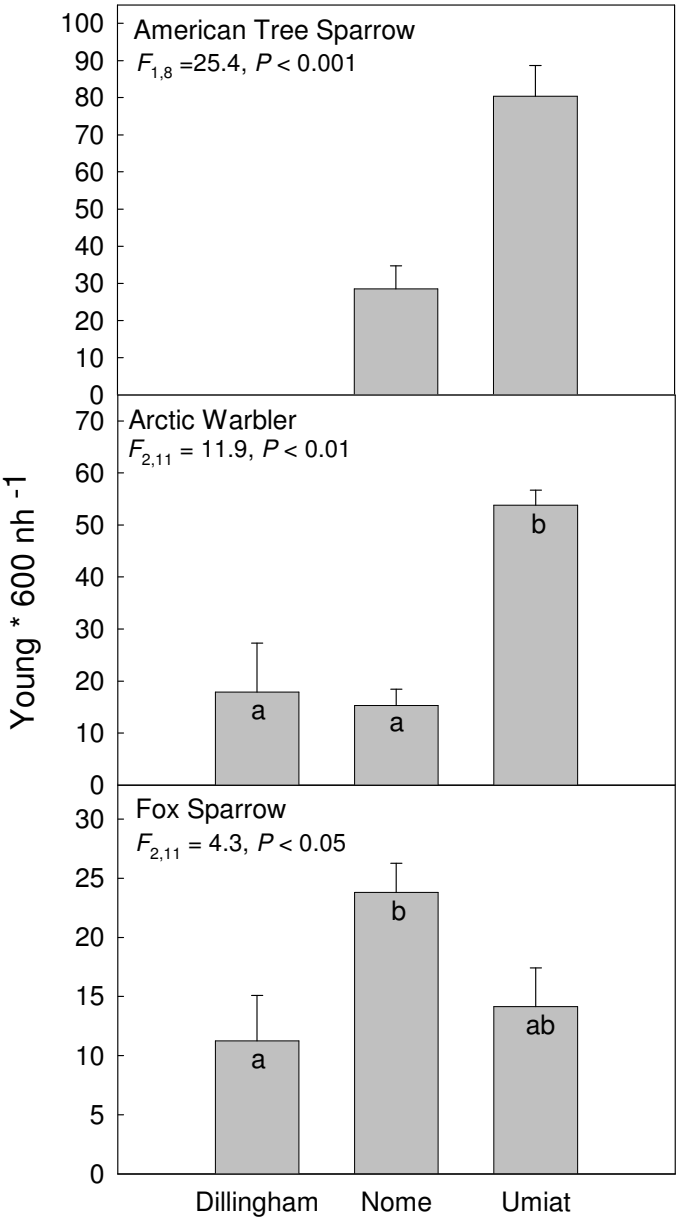


FIGURE 3. Mean (error bars = 1 SE) capture rate of young birds for species with significant ($P < 0.05$) differences between (or among) locations. For species captured at all three locations (either adult or young), significant differences among locations are indicated by different letters (based on Tukey's HSD test).



APPENDIX I. Species sequence numbers (AOU checklist order), alpha codes, and common names for all species banded or encountered during the first year (2006) of the MAPS Program at the five stations operated near **Dillingham,** Alaska. Breeding status for this first year at each station is also indicated (B = Breeder, T = Transient; M = Migrant).

			Station code				
NUMB	**SPEC**	**SPECIES NAME**	TWMV	DEWV	MOPC	SLAK	H364
00100	COLO	Common Loon		T	T		
02130	BAEA	Bald Eagle		T			
02960	SPGR	Spruce Grouse			B		
03600	SACR	Sandhill Crane		T		T	T
04140	HUGO	Hudsonian Godwit				M	
04460	WISN	Wilson's Snipe	B	B	B	B	B
04680	MEGU	Mew Gull					T
09700	ATTW	American Three-toed Woodpecker	B	B	B	T	T
11475	ALFL	Alder Flycatcher			B	B	B
12910	GRAJ	Gray Jay	T	T		T	T
13300	CORA	Common Raven	T	T	T	T	T
13570	BCCH	Black-capped Chickadee	B	T	B	T	
13610	BOCH	Boreal Chickadee	B	B	T	T	
13690	RBNU	Red-breasted Nuthatch	B	B	B	B	
13730	BRCR	Brown Creeper	T	B		T	
14250	RCKI	Ruby-crowned Kinglet	T	B	B	T	T
14320	ARWA	Arctic Warbler	B	B	B	B	B
14790	GCTH	Gray-cheeked Thrush			T	B	B
14810	SWTH	Swainson's Thrush	B	B	B	B	B
14820	HETH	Hermit Thrush				T	T
15000	AMRO	American Robin	B	T	T	B	B
15060	VATH	Varied Thrush	B	B	B	B	B
15660	OCWA	Orange-crowned Warbler	B	B	B	B	B
15800	MYWA	Myrtle Warbler	B	B	B	B	B
15970	BLPW	Blackpoll Warbler	B	B	B	B	B
16090	NOWA	Northern Waterthrush	B	B	B	T	T
16290	WIWA	Wilson's Warbler	B	B	B	B	B
18130	SAVS	Savannah Sparrow	B	B		B	B
18220	FOSP	Fox Sparrow		T		B	B
18230	SOSP	Song Sparrow	T				
18240	LISP	Lincoln's Sparrow	T	B	B	B	B
18290	GWCS	Gambel's White-crowned Sparrow	B	T	T	T	B
18300	GCSP	Golden-crowned Sparrow	B	T	B	B	B
18320	SCJU	Slate-colored Junco	B	B	B	B	B
19330	PIGR	Pine Grosbeak	B	B	T		
19390	WWCR	White-winged Crossbill	B	B	T	T	T
19400	CORE	Common Redpoll	B	B	B	B	B

APPENDIX II. Species sequence numbers (AOU checklist order), alpha codes, and common names for all species banded or encountered during the first year (2006) of the MAPS Program at the five stations operated near **Nome,** Alaska. Breeding status for this first year at each station is also indicated (B = Breeder, T = Transient; M = Migrant).

			Station code					
NUMB	**SPEC**	**SPECIES NAME**	SOLO	NOMA	NOMB	BOYA	SNRI	PERI
00070	RTLO	Red-throated Loon		T				
01460	CANG	Canada Goose		T	T	T	T	T
01520	TUSW	Tundra Swan						T
01610	AMWI	American Wigeon				T		
01720	NOPI	Northern Pintail					T	
01750	GWTE	Green-winged Teal						T
01870	HADU	Harlequin Duck	T	T	T			T
01990	RBME	Red-breasted Merganser	T	T	T		T	T
02170	NOHA	Northern Harrier					T	
02970	WIPT	Willow Ptarmigan		B	T		T	
03600	SACR	Sandhill Crane	T	T		T		T
03750	SEPL	Semipalmated Plover	T	B	T			T
03910	LEYE	Lesser Yellowlegs	T		T			
04020	SPSA	Spotted Sandpiper						T
04150	BTGO	Bar-tailed Godwit					T	
04460	WISN	Wilson's Snipe	T	T	B	B	B	B
04580	LTJA	Long-tailed Jaeger	T		T			T
04680	MEGU	Mew Gull	T	T	T	T		
04710	HERG	Herring Gull	M					
04800	GLGU	Glaucous Gull	T	T	T	T	T	
04950	ARTE	Arctic Tern		T	T		T	
11475	ALFL	Alder Flycatcher	T			T		T
13300	CORA	Common Raven	B	B	T	T	B	T
13410	TRES	Tree Swallow	T	B		T		B
13510	BANS	Bank Swallow	T	T				T
13570	BCCH	Black-capped Chickadee			T	T	T	
14210	AMDI	American Dipper						B
14320	ARWA	Arctic Warbler		B	B		B	B
14500	BLUE	Bluethroat		T			T	
14790	GCTH	Gray-cheeked Thrush	B	B	B	B	B	B
15000	AMRO	American Robin	T	B	B	B	B	B
15060	VATH	Varied Thrush		T				
15420	EYWA	Eastern Yellow Wagtail	B					
15660	OCWA	Orange-crowned Warbler	B	B	B		B	B
15750	YWAR	Yellow Warbler	B	B	B	B	B	B
15970	BLPW	Blackpoll Warbler	B	B	T	B	T	T
16090	NOWA	Northern Waterthrush	B	B	B	B	B	B

			Station code					
NUMB	**SPEC**	**SPECIES NAME**	SOLO	NOMA	NOMB	BOYA	SNRI	PERI
16290	WIWA	Wilson's Warbler	B	B	B	B	B	B
18010	ATSP	American Tree Sparrow	B	B	B	B	B	B
18130	SAVS	Savannah Sparrow	B	B	B		B	B
18220	FOSP	Fox Sparrow	B	B	B	B	B	B
18290	GWCS	Gambel's White-crowned Sparrow	B	B	B	B	B	B
18300	GCSP	Golden-crowned Sparrow	T	T	T		T	B
18350	LALO	Lapland Longspur	T					
18850	RUBL	Rusty Blackbird	T					
19400	CHRE	Common/Hoary Redpoll	T	B	B	B	B	B
19400	CORE	Common Redpoll	B	B	B	B	B	B
19410	HORE	Hoary Redpoll	B	B	B	B	B	B
19430	PISI	Pine Siskin			M			

APPENDIX III. Species sequence numbers (AOU checklist order), alpha codes, and common names for all species banded or encountered during the first year (2006) of the MAPS Program at the five stations operated near **Umiat,** Alaska. Breeding status for this first year at each station is also indicated (B = Breeder, T = Transient; M = Migrant).

			Station code				
NUMB	**SPEC**	**SPECIES NAME**	EUMN	WUMN	RIRO	SOBA	WELF
00070	RTLO	Red-throated Loon				T	
00090	PALO	Pacific Loon	T		B		
01410	GWFG	Greater White-fronted Goose					B
01460	CANG	Canada Goose	B	T	T	T	B
01480	BRAN	Brant		T			
01610	AMWI	American Wigeon			T	B	T
01630	MALL	Mallard					T
01720	NOPI	Northern Pintail			T		
01750	GWTE	Green-winged Teal			T		
01810	GRSC	Greater Scaup				B	
01990	RBME	Red-breasted Merganser					T
02480	RLHA	Rough-legged Hawk			T		B
02700	PEFA	Peregrine Falcon			T		
02970	WIPT	Willow Ptarmigan			T	T	
03600	SACR	Sandhill Crane			T		
03750	SEPL	Semipalmated Plover			B		
03910	LEYE	Lesser Yellowlegs			M	M	
04020	SPSA	Spotted Sandpiper		T	T		T
04460	WISN	Wilson's Snipe			B		
04800	GLGU	Glaucous Gull	T	T	T		T
11620	SAPH	Say's Phoebe					T
12530	NSHR	Northern Shrike		T	B	T	
12910	GRAJ	Gray Jay	T	T	B	T	
13300	CORA	Common Raven	T	T	T	T	T
14320	ARWA	Arctic Warbler	B	B	B	B	B
14500	BLUE	Bluethroat	T	T		T	T
14790	GCTH	Gray-cheeked Thrush	B	B	B	B	B
15000	AMRO	American Robin	B	B	B	B	B
15420	EYWA	Eastern Yellow Wagtail	B	B	T	T	B
15510	AMPI	American Pipit		T			
15750	YWAR	Yellow Warbler	B	B	B	B	B
15800	MYWA	Myrtle Warbler			M		
16090	NOWA	Northern Waterthrush	T	T		T	T
16290	WIWA	Wilson's Warbler	T		T	T	T
18010	ATSP	American Tree Sparrow	B	B	B	B	B
18130	SAVS	Savannah Sparrow	T	B	B	B	T
18220	FOSP	Fox Sparrow	T	B	B	B	B

			Station code				
NUMB	**SPEC**	**SPECIES NAME**	EUMN	WUMN	RIRO	SOBA	WELF
18290	GWCS	Gambel's White-crowned Sparrow	B	B	B	B	B
19400	CHRE	Common/Hoary Redpoll	B	B			
19400	CORE	Common Redpoll	B	B	B	B	B
19410	HORE	Hoary Redpoll	B	B	B	B	B