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THE MONITORING AVIAN PRODUCTIVITY AND SURVIVORSHIP (MAPS) PROGRAM 2002 AND 2003 REPORT[1]

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Abstract. This report summarizes results of the Monitoring Avian Productivity and Survivorship (MAPS) Program during 2002, when 505 stations were operated, and 2003, when 456 stations were operated. Changes in adult population size and productivity (i.e., reproductive index, defined as young/adult) between 2001 and 2002 and between 2002 and 2003 were derived from constant-effort data from 417 and 349 stations, respectively. Adult population sizes *increased* significantly in 2002 at the program-wide scale and, with varying significance, in each of the seven MAPS regions except the Alaska/Boreal Canada Region. In contrast, productivity in 2002 *decreased* significantly at the program-wide scale and in all regions except the Alaska/Boreal Canada and South-central regions, where it tended to increase. The patterns of changes in both adult population size and productivity in 2003 were nearly exactly reversed from those in 2002, with substantial and generally significant *decreases* in adult population size program-wide and in all regions except the Alaska/Boreal Canada and South-central regions; and a significant *increase* in productivity program-wide and increases of varying significance in five of the seven regions. These generally alternating, out-of-phase patterns in productivity and population size have been characteristic of MAPS data for many years and suggest density-dependent population regulation in which (a) increased productivity in a given year leads to increased population sizes the following year through increased recruitment of young birds, and (b) the increased population sizes suppress productivity through increased competition for food or other resources needed for reproduction. That these patterns of changes have not been consistent in all regions in all years suggests that density-independent factors may also drive changes in productivity and that other factors besides productivity (e.g., survival of young and adult birds) also drive annual changes in adult population size. We used modified Cormack-Jolly-Seber (CJS) mark-recapture analyses, with ad-hoc between- and within-yr transient models, on 12 years (1992-2003) of data pooled from 550 stations operated for at least four consecutive years to estimate program-wide and regional annual adult apparent survival (φ) and recapture probabilities and proportions of residents among newly captured adults for over 180 species. The mean number of stations per region contributing data (79) and mean number of species per region for which survival rates could be estimated (62) were 15% and 5.4% greater, respectively, than the analogous means (68 stations and 59 species) for the previous 10-yr (1992-2001) analyses. The increased number of stations and years of data resulted in continued increases in the precision of survival estimates: the mean number of species per region with CV(φ)<30%, <20%, and <10% increased by 11%, 11%, and 31%, respectively, using 12, rather than 10, years of data. As in previous years, a pattern was detected in which mean regional adult survival rates decreased with increasing latitude; they also were higher for the two western regions, lower for two eastern regions, and lowest for the two central regions. For each of the seven regions, survival estimates for species for which CV(φ)<30% were lower for the 12-yr (1992-2003) than 10-yr (1992-2001) data set, continuing the pattern noted in

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previous reports and suggesting that survival has been decreasing in each region. For all species pooled at the program-wide scale, we used (a) chain indices to estimate a highly significant 12-yr (1992-2003) decline in adult population size of -1.86% per year, and a widely fluctuating temporal pattern in productivity with a decreasing tendency of -1.02% per year; and (b) both time-dependent and linear trend CJS models to estimate a significant 10-yr (1993-2002) decline in adult apparent survival of -0.83% per year. These declines in vital rates will likely increase the difficulty of reversing the population declines in these landbird species. Finally, we found a weak correlation between adult survival from year *t* to year *t*+1 and productivity in year *t*+1, a pattern indicating that some of the same factors driving annual variations in survival might also drive annual variations in productivity, and that these factors may act during the non-breeding season. This is consistent with previous results from MAPS showing that annual variations in productivity of Neotropical migratory species breeding in the Pacific Northwest were driven by late-winter/early-spring weather conditions on their wintering grounds.

Key words: constant-effort mist netting and banding; landbird demographics; MAPS Program; population trends; productivity indices; survival rates.

INFORME SOBRE EL PROGRAMA MONITOREO DE PRODUCTIVIDAD Y SOBREVIVENCIA DE AVES (MAPS) EN 2002 Y 2003

Resumen. Este informe resume los resultados del programa MAPS durante los años 2002-2003, en los que MAPS alcanzó las 505 estaciones en 2002 y 456 en 2003. Obtuvimos los cambios poblacionales en adultos y productividad (es decir, índice de productividad, definido como la proporción de juveniles a adultos) entre 2001 y 2002 y entre 2002 y 2003, a partir de datos de esfuerzo constante de 417 y 349 estaciones respectivamente. Los tamaños poblacionales de adultos aumentaron significativamente en 2002 a escala del programa completo y, con significatividad variable, en cada una de las siete regiones MAPS exceptuando la región Alaska/Canadá boreal. En cambio, la productividad en 2003 descendió significativamente a la escala del programa completo y en todas las regiones excepto en las regiones de Alaska/Canadá boreal y Centro-sur, donde tendió a aumentar. Los patrones de cambio tanto en tamaño poblacional adulto y productividad en 2003 fueron casi exactamente opuestos a los de 2002, con descensos marcados y en general significativos en tamaño poblacional de adultos en todo el programa y en todas las regiones excepto Alaska/Canadá boreal y Centro-sur; un aumento significativo en productividad fue detectado a nivel del programa completo y aumentos de significatividad variable en cinco de las siete regiones. Estos patrones generalmente alternantes y desfasados en productividad y tamaño poblacional han sido característicos en los datos de MAPS durante muchos años y sugieren una regulación poblacional densodependiente en la que (a) el aumento de productividad en un año lleva a un aumento poblacional al año siguiente debido al reclutamiento de jóvenes, y (b) el aumento poblacional reduce la productividad debido al aumento de la competición por alimento y otros recursos necesarios para la reproducción. El hecho de que estos patrones no hayan sido constantes entre regiones y entre años sugiere que factores densoindependientes pueden también causar cambios en productividad y que otros factores aparte de productividad (por ejemplo sobrevivencia de juveniles y adultos) pueden hacer variar los cambios anuales en tamaño poblacional de adultos. Utilizamos análisis de marcaje y recaptura modificados de Cormack-Jolly-Seber (CJS), con modelos transitivos ad-hoc, entre años y por año, en 12 años (1992-2003) de datos recabados de 550 estaciones que operaron al menos cuatro años consecutivos para estimar la sobrevivencia aparente (φ) de adultos a nivel del programa completo y a nivel regional, y probabilidades de recaptura y proporciones de residetes entre nuevos adultos capturados. El número promedio de estaciones por región que contribuyó datos (79) y el número de especies por región para las que se pudo calcular tasas de sobrevivencia (62) fueron 15% y 5.4% mayores, respectivamente, que los promedios análogos (68 estaciones y 50 especies) en los 10 años anteriores (1992-2001). El aumento de estaciones y años de datos resultaron en aumentos

continuados en la precisión de las estimas de sobrevivencia: el número promedio de especies por región con CV(φ) <30%, <20%, y <10% aumentaron un 11%, 11% y 31% respectivamente, utilizando 12 en lugar de 10 años de datos. Como en años anteriores, detectamos un descenso de las tasas de sobrevivencia de adultos con el aumento de la latitud; también fueron más altas para las dos regiones del oeste, más bajas para dos regiones del este, y las más bajas se registraron en las dos regiones centrales. Para cada una de las siete regiones, las estimas de sobrevivencia por especie para las que CV(φ)<30% fueron más bajas en el periodo de 12 años (1992-2003) que en el de 10 años (1992-2001), continuando el patrón ya documentado en informes anteriores y sugiriendo que la sobrevivencia ha descendido en cada región. Para todas las especies agrupadas a escala del programa completo, utilizamos (a) índices en cadena para estimar un declive en tamaño poblacional adulto de -1.85% por año en 12 años (1992-2003) altamente significativo, y un patrón temporal de productividad ampliamente fluctuante con tendencia al descenso del -1.02% por año; y (b) modelos de CJS de tendencias tempodependientes y lineales para estimar el declive de 12 años en sobrevivencia aparente de adultos de -0.83% por año. Estos declives en tasas vitales aumentarán seguramente la dificultad de invertir los declives poblacionales en estas especies de aves terrestres. Por último, encontramos una correlación débil entre sobrevivencia entre los años *t* y *t*+1, y productividad en el año *t*+1, un patrón que indica que algunos de los mismos factores causantes de la variación anual en sobrevivencia podrían también influenciar la variación en productividad, y que estos factores podrían actuar durante la temporada no reproductiva. Esto es consecuente con resultados previos de MAPS, que muestran que la variación anual en productividad de las especies migratorias neárticas-neotropicales que crían en el Noroeste Pacífico se deben a las condiciones meteorológicas de finales de invierno y principios de primavera en las áreas de invernada.

Palabras clave: programa MAPS, redeo y anillamiento de esfuerzo constante, demografía de aves terrestres, tendencias poblacionales, indices de productividad, tasas de sobrevivencia.

INTRODUCTION

The Monitoring Avian Productivity and Survivorship (MAPS) Program is a continent-wide, cooperative network of nearly 500 constant-effort mist-netting stations operated annually during the breeding season (May to August) (DeSante et al. 1995, DeSante and Kaschube 2006). MAPS was patterned to some extent after the British Constant Effort Sites scheme (Baillie et al. 1986, Peach et al. 1996, 1998) and was established by The Institute for Bird Populations (IBP) in 1989 to collect long-term data on the vital rates (primary demographic parameters such as productivity and survivorship) of North American landbirds at multiple spatial scales ranging from station-specific and local-landscape to program-wide. MAPS now provides productivity indices from young/adult ratios of captured birds, and estimates of adult apparent survival, recruitment, and population growth rates from Cormack-Jolly-Seber (CJS) analyses of capture-mark-recapture data on adult birds for over 180 landbird species.

The research goals of MAPS are to describe temporal and spatial patterns in these vital rates, and relationships between these patterns and (a) ecological characteristics and population trends of species, (b) station-specific and landscape-scale habitat characteristics, and (c) spatially-explicit weather variables. The management goals of MAPS are to use these patterns and relationships to (a) determine the proximate demographic cause(s) of population change, (b) formulate management actions and conservation strategies to reverse population declines and maintain stable or increasing populations, and (c) evaluate the effectiveness of the management actions and conservation strategies implemented.

Baillie (1990) was among the first to argue that monitoring vital rates must be a component of any successful integrated avian population monitoring scheme. DeSante (1995), DeSante and Rosenberg (1998), and DeSante et al. (2005) extended these ideas by arguing that effective avian management also must be based on vital rates as well as population sizes and trends. The reasons for this are manifold. First, abundance

metrics and the trends derived from them may not accurately reflect habitat quality (Van Horne 1983) because of source-sink dynamics (Pulliam 1988, Donovan et al. 1995) and evolutionary and ecological traps (Schlaepfer et al. 2002). Second, populations of migratory species could be limited by processes acting at times other than those when abundance is measured, thus further obscuring the link between abundance and habitat quality (Marra et al. 1998). Third and closely related, vital rates provide crucial information about the stage of the life cycle at which population change is being effected (DeSante 1992). This information is particularly important for migratory birds because it can suggest whether management actions should be directed toward a species' breeding grounds, wintering grounds, or both. Fourth, environmental stressors and management actions affect vital rates directly and usually without the time lags that often occur with population size (Temple and Wiens 1989, DeSante and George 1994). And finally, demographic rate estimates can be incorporated into predictive population models to assess potential effects of a variety of land use or climate factors (Noon and Sauer 1992). Thus, demographic monitoring not only complements abundance monitoring, but also has the potential to provide more timely and insightful information for management and conservation applications.

In this report we present results of the MAPS Program during 2002 and 2003 using data from 497 and 444 stations, respectively. For all species with adequate data (and for all species pooled), we compare, in a constant-effort manner, the program-wide and regional indices of adult population size and post-fledging productivity obtained during each of these two years with the analogous indices obtained during the immediately preceding year. Then, using data from 550 stations each operated for four or more consecutive years during the 12-yr period 1992-2003, we present program-wide and regional estimates of time-constant annual adult apparent survival probability, recapture probability, and proportion of residents among newly captured adults, along with estimates of the extent of time-dependence in these parameters. Finally, for all species pooled at the program-wide scale, we use chain indices to estimate 12-yr trends in adult population size and productivity, and both time-dependent and linear-trend CJS models to estimate a 10-yr trend in adult survival rate..

METHODS

The overall design of the MAPS Program and the general field methods are described in DeSante et al. (1996, 1998) and discussed in DeSante et al. (2004). Detailed, standardized methods and instructions for the establishment and operation of MAPS stations are provided by DeSante et al. (2007). Briefly, MAPS stations were established in 20-ha study areas at locations where long-term mist netting was practical and permissible. In general, the locations of MAPS stations were chosen by the station operators (often according to a hypothesis-driven strategy) and not by a probability-based sampling design, although elements of a random sampling strategy were sometimes employed. Operators generally adhered to MAPS site-selection criteria (DeSante et al. 2007), but some aspects of site selection were dictated by logistical concerns.

DATA COLLECTION

Normally, 10 permanent net sites were distributed rather uniformly throughout the central eight ha of each 20-ha study area, but were placed at specific locations where birds could be captured most efficiently. One mist net (typically 12-m length, 30-mm mesh) was erected at each net site and the type and location of all nets were kept constant for the duration of the study. Typically, nets were operated for six hours per day, beginning at local sunrise, for one day per 10-d period, and for six to 10 consecutive 10-d periods beginning between May 1 and June 10 (later at more northerly latitudes and higher altitudes) and continuing through August 8. To facilitate constant-effort comparisons of data, nets were opened, checked, and closed in the same order on all days of operation.

Each bird captured was marked with a uniquely-numbered aluminum leg band provided by the Biological Resources Division of the U.S. Geological Survey or the Canadian Wildlife Service. Band number, capture status, species, age, sex, ageing and sexing criteria (skull pneumaticization, breeding condition, feather wear, molt, molt limits, plumage characteristics), physical condition (mass, wing chord, fat

content) date, time, station, and net number were recorded for all birds captured, including recaptures. The times of opening and closing the nets and beginning each net run were recorded each day so that effort could be calculated for each 10-d period and standardized between years. The breeding (summer residency) status of each species recorded at the station was determined by the station operator using methods similar to those employed in breeding bird atlas projects.

DATA ENTRY AND VERIFICATION

Computer data entry and proofing were conducted by MAPS operators or, in those cases where operators were unable to enter their own data, by John W. Shipman of Zoological Data Processing, Socorro, NM (entry) and by IBP staff biologists (proofing). After computer entry and proofing, MAPS data were run through verification routines that: (1) checked the validity and ranges of all data; (2) screened each banding record by comparing the species, age, and sex determinations to the ageing and sexing criteria used; (3) screened banding data for inconsistent species, age, or sex determinations for all records of each band number; and (4) screened banding, effort, and breeding status data for inconsistencies. These verification routines were conducted by IBP biologists or, increasingly in recent years, by the MAPS operators themselves through the use of MAPSPROG, a user-friendly Visual dBASE data entry/import, verification/editing, and error-tracking program that operates on a Windows platform (Froehlich et al. 2006).

DATA ANALYSES

Methods of data analysis have been described in DeSante and Burton (1994), DeSante et al. (1998), and DeSante and O'Grady (2000); discussed in DeSante et al. (2004); and are briefly summarized here. We divided North America north of Mexico into eight major geographic regions based on biogeographical and meteorological considerations and delineated along lines consistent with physiographic strata established in conjunction with the North American Breeding Bird Survey (BBS; Robbins et al. 1986). These eight MAPS regions are Northwest, Southwest, North-central, South-central, Northeast, Southeast, Alaska, and Boreal Canada (see maps in DeSante et al. 1993a and DeSante and Burton 1994). Because of the small number of station in the two northernmost regions, we pooled data from them into a single Alaska/Boreal Canada region.

Throughout, we use an alpha level of $P < 0.05$ to indicate statistical significance, and $P < 0.01$ to indicate highly significant differences or relationships. In Tables 1-2, we also identify species for which between-year differences were nearly significant at $0.05 < P < 0.10$.

1. *Population Size and Productivity Indices* — The numbers of individual adult birds of each species captured each year, pooled over all stations within each region (and over all regions) that were located within the breeding range of the species, were used as annual regional (or program-wide) indices of adult population size for the species. Similarly, for each species in each region (and over all regions), the pooled numbers of individual young birds divided by the pooled numbers of individual adult birds ("reproductive indices"), were used as annual regional (or program-wide) indices of post-fledging productivity. Reproductive index (young/adult) is more consistent with other commonly-used measures of reproductive success than "productivity index," which is defined as the proportion of young in the catch [young/(young+adult)] and was used in earlier MAPS reports. Data from a given station in a given year were included in population size and productivity analyses if the station was operated for at least five periods that year, of which at least three periods occurred during the earlier and at least two during the later parts of the season [adult and young superperiods, respectively; see DeSante et al. (2007) for definitions].

Year-to-year changes in the numbers of adult and young birds were calculated using net-opening and -closing times and net-run times on a net-by-net and period-by-period basis to exclude captures that occurred in a given net in a given period in one year at a time when that net was not operated in that period in the other year. This allowed captures during the two years to be compared in a rigorous, constant-effort manner. The statistical significance of annual changes in the regional (or program-wide) indices of adult population size and productivity were inferred for each species from confidence intervals

calculated from the standard errors of the mean percentage changes. Changes were considered significant if confidence intervals did not include zero. Formulae for these standard errors and confidence intervals were given in Peach et al. (1996) and were derived from those given in Cochran (1977). We also inferred, by means of binomial tests, the statistical significance of regional (or program-wide) changes in adult population size and productivity indices from the proportion of target species that increased or decreased in each region. We included species in these regional population size and productivity analyses for which adults were captured at two or more stations in the region and for which at least 50 aged individuals were captured at all stations pooled in either of the two years being compared.

We estimated 12-yr (1992-2003) trends for the indices of adult population size and productivity for all species pooled at the program-wide scale by "chaining" the 11 constant-effort (as defined above) year-to-year changes in these annual indices and calculating the slope of the regression of the "chain" indices. For the trend in adult population size, we used an arbitrary starting index of 100 in 1992 and calculated chain indices in each subsequent year by first multiplying the proportional change between the two years times the index of the previous year and then adding that amount to the index of the previous year. Trends in productivity were calculated in an analogous manner, except that we started with the actual reproductive index in 1992 (0.702) and chained the annual proportional changes in the reproductive index over the 12 years.

2. *Survival Rate Estimates* — We calculated maximum-likelihood estimates and standard errors for annual adult apparent survival probabilities (φ) and recapture probabilities (p) for all species in each region for which adequate data were obtained. These survival estimates are termed apparent survival because permanent emigration from the station is not distinguishable from actual mortality. We used Cormack-Jolly-Seber (CJS) capture-mark-recapture analyses (Clobert et al. 1987, Pollock et al. 1990, Lebreton et al. 1992) that incorporated a between-year transient model (Pradel 1997), as well as an ad-hoc length-of-stay within-year transient model (Nott and DeSante 2002, Hines et al. 2003). These transient models also permit estimation of τ (the proportion of residents among those newly captured adults that were not recaptured seven or more days later during their first year of capture), and provide apparent survival rate estimates that are unbiased with respect to transient individuals (Pradel 1997, Hines et al. 2003).

Parameter estimates were calculated from the capture histories of all adult birds captured at all stations in the region at which the species was a usual breeder (i.e., attempted to breed during more than half of the years the station was operated). Data from a given station were included in survivorship analyses if the station was operated for at least four consecutive years during the 12-yr period 1992-2003, and was operated during each of those four or more years for at least three periods during the adult superperiod (see above). Stations within 1 km of each other were merged into a single "super-station" and data from those stations were pooled prior to creating capture histories of individual birds. This prevented individuals whose home range encompassed parts of both stations from being treated as two different individuals. We included species in these survivorship analyses for which an average of at least 2.5 individual adult birds were captured during each of the 12 years 1992-2003 (at least 30 year-unique individuals) from all stations pooled, and for which there were at least two returns (between-year recaptures) from all stations pooled. We considered survival probability to be "better estimated" for species for which: (1) φ was based on at least five returns over the 10 years; (2) τ (the estimate of the proportion of residents among those newly captured adults that were not recaptured seven or more days later during their first year of capture) was <1.00; (3) SE(φ)<0.20; and (4) CV(φ)<30%.

We modeled all eight combinations of time-dependence (and -independence) for each of the three parameters (survival probability - φ, recapture probability - p, proportion of residents - τ) contained in the transient model using TMSURVIV (Hines et al. 2003), a version of the computer program SURVIV (White 1983) modified by J. E. Hines. We used the Akaike Information Criterion ($QAIC_C$) to select appropriate models for each species such that the

selected model was the one with the lowest $QAIC_C$ (Burnham and Anderson 1992). We considered models having $QAIC_C$ values within two $QAIC_C$ units of each other to be equivalent models. $QAIC_C$ was calculated as:

-2(log-likelihood) +2(number of estimable parameters)

with corrections for small sample sizes and overdispersion of data.

We further estimated the relative likelihood of each of the eight models using $QAIC_C$ weights (w_i; Burnham and Anderson 1998). Statistical support for time-dependence in survival and recapture probabilities and in proportion of residents was assessed by summing the w_i for all models in which time-dependence in the parameter of interest occurred. This method of multi-model inference enabled us to use the entire set of eight models to judge the importance of time-dependence, rather than basing conclusions on a single best-fit model. A w_i value > 0.5 indicates strong support for time-dependence in the given parameter, while $0.50 \geq w_i > 0.25$ suggests some support for time-dependence in that parameter.

Finally, in order to gain additional insight into the issues of time-dependence and temporal trend in survival, we used the ad-hoc transient model in Program MARK (White and Burnham 1999) to model *program-wide* survival (φ) and recapture (p) probabilities *for all species pooled* as (a) time-constant, (b) time-dependent, and (c) as a linear function of time. We again used $QAIC_C$ (Burnham and Anderson 1992) and $QAIC_C$ weights (w_i; Burnham and Anderson 1998) to select among the nine possible models.

RESULTS

NUMBER AND DISTRIBUTION OF STATIONS

A total of 505 MAPS stations was operated during 2002, a 1.4% increase over the 498 operated during 2001. Of these, 50 (9.9%) were new in 2002 while 450 were operated during 2001 and five were not operated during 2001 but were operated during several years prior to 2001. A total of 90.4% of the stations in operation in 2001 continued to be operated in 2002. We received data useable for productivity and/or survivorship analyses in time to be included in this report from 497 of the 505 stations that were operated during 2002. A total of 456 MAPS stations was operated during 2003, 49 (9.7%) fewer than were operated during 2002. Of these, 52 (11.4%) were new in 2003 while 400 were in operation during a previous year. A total of only 79.2% of the stations in operation during 2002 continued to be operated during 2003. We received data useable for productivity and/or survivorship analysis in time to be included in this report from 444 of the 456 stations that were operated during 2003. The principal operator, sponsoring organization, location, elevation, and habitat(s) for each station newly established in 2002 or 2003 (or that was established prior to 2002 but not previously reported) are presented in the Appendix. See previous annual reports (DeSante et al. 1993b, 1996, 1998, DeSante and Burton 1994, DeSante and Kaschube 2006, and DeSante and O'Grady 2000) for these data for stations established prior to 2002.

The proportions of stations located in each of the eight MAPS regions were very similar during 2002 (Fig. 1) to analogous proportions in previous years. The proportions during 2003 (Fig. 1) were also virtually identical to those during 2002 for the Boreal Canada, North-central, South-central, and Southwest regions. The proportions during 2003, however, increased somewhat compared to previous years in the Northwest and Northeast regions (that together provided over 50% of the stations in 2003), decreased in the Southeast Region, and dropped to zero in the Alaska Region. The locations of the 857 stations that were operated for one or more years between 1992 and 2003 are mapped in Figure 2.

ADULT POPULATION SIZE AND PRODUCTIVITY

1. *Changes between 2001 and 2002* — Constant-effort data on the numbers of adult and young birds captured and the reproductive index (young/adult) were obtained for 2001 and 2002 from 417 MAPS stations across North America that were operated comparably in both years. The changes between 2001 and 2002 in these numbers and ratios are presented for the entire continent (program-wide) and for each MAPS region in Table 1 for those species that met the productivity selection criteria (see Methods – Data Analysis) and for all species pooled. These included 133 species program-wide, 65 species in

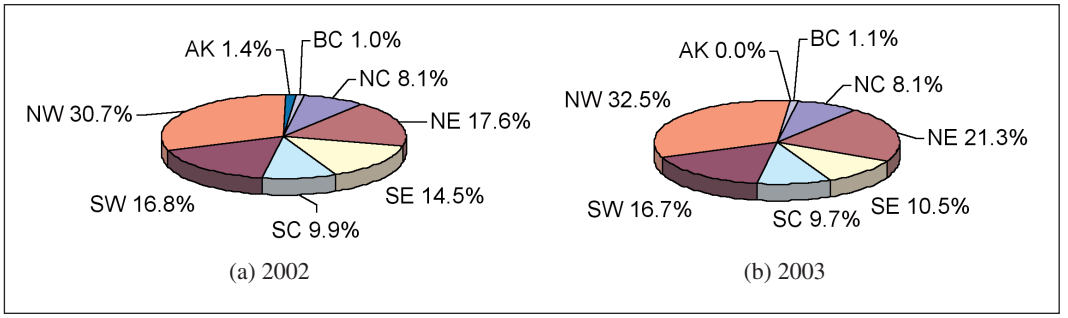

FIGURE 1. Proportion of MAPS stations in each of the seven major geographical regions (NW - Northwest; SW - Southwest; NC - North-central; SC - South-central; NE - Northeast; SE - Southeast; AK/BC - Alaska/Boreal Canada) during (a) 2002 and (b) 2003.

the Northwest, 37 in the Southwest, 24 in the North-central, 23 in the South-central, 40 in the Northeast, 30 in the Southeast, and 8 in the combined Alaska/Boreal Canada region.

(a) *Changes in adult populations* — The index of adult population size for all species pooled (number of adults captured) increased between 2001 and 2002 in all regions except the Alaska/Boreal Canada/ Region (where it decreased by a non-significant 6.0%) by amounts ranging from 1.6% (North-central) to 33.4% (Southwest). The increases for the Southwest and Northwest were highly significant and nearly significant, respectively. The proportion of increasing species was >50% in four regions, equal to 50% in the Alaska/Boreal Canada

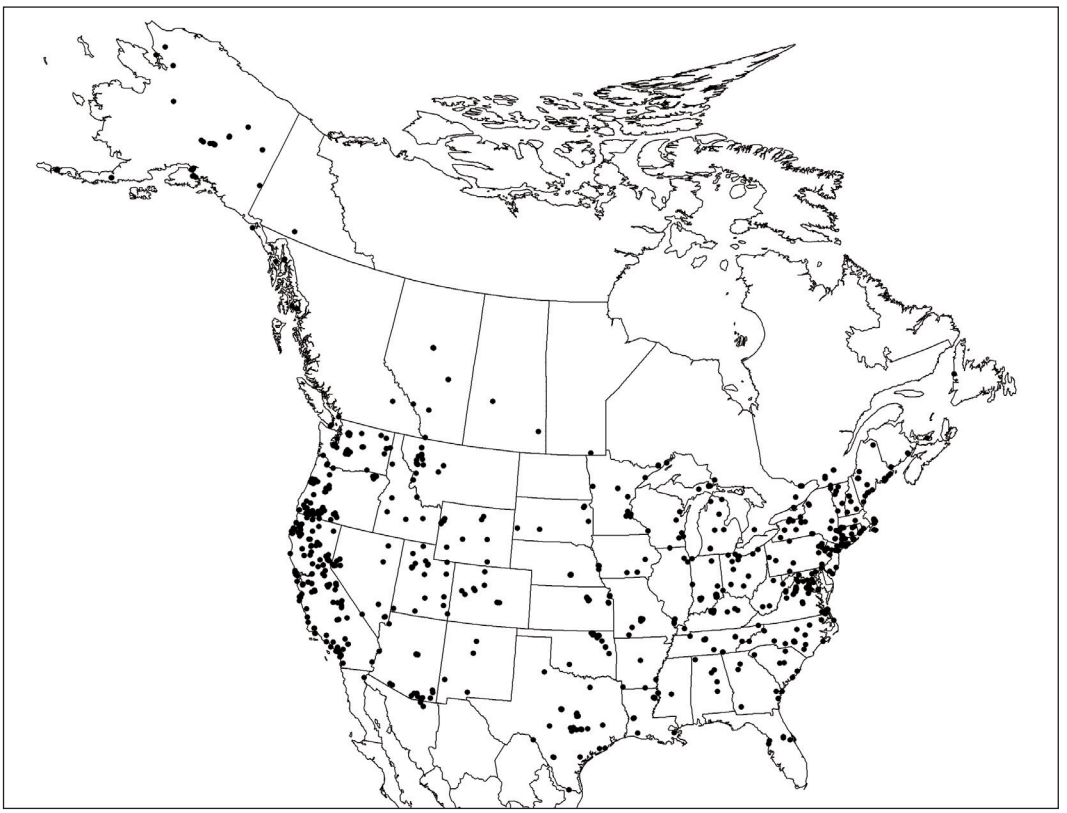

FIGURE 2. Locations of the 857 MAPS stations that were operated during one or more years between 1992 and 2003. Some of the larger "individual" squares can represent as many as 11 stations.

TABLE 1. Program-wide and regional changes between 2001 and 2002 in the numbers of adult and young individuals captured and in the reproductive index (young/adult) for 133 species and all species pooled (excluding gallinaceous birds and hummingbirds) at the 417 MAPS stations run comparably during both years. For each species, data were included only from stations within the breeding range of the species. Only species for which adults were captured at two or more stations and for which 50 or more aged individuals were captured in either year are included.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2001	2002	%chg.	SE[b]	n[c]	2001	2002	%chg.	SE[d]	n[e]	2001	2002	change	SE[f]	%chg.
PROGRAM-WIDE																
Common Ground-Dove	11	80	71	-11.3	25.7	5	37	9	-75.7	23.0 **	11	0.463	0.127	-0.336	0.202	-72.6
Red-bellied Woodpecker	56	39	61	56.4	36.7 *	19	11	12	9.1	40.2	62	0.282	0.197	-0.085	0.116	-30.3
Red-naped Sapsucker	30	59	54	-8.5	13.1	18	18	16	-11.1	25.5	31	0.305	0.296	-0.009	0.102	-2.9
Red-breasted Sapsucker	57	129	134	3.9	12.7	36	85	75	-11.8	20.2	58	0.659	0.560	-0.099	0.137	-15.1
Nuttall's Woodpecker	26	50	53	6.0	18.3	25	47	36	-23.4	18.4	29	0.940	0.679	-0.261	0.228	-27.7
Downy Woodpecker	210	300	316	5.3	9.1	184	294	269	-8.5	8.1	253	0.980	0.851	-0.129	0.126	-13.1
Hairy Woodpecker	143	107	120	12.2	15.0	69	55	37	-32.7	15.2 *	170	0.514	0.308	-0.206	0.107 *	-40.0
Northern Flicker	95	70	81	15.7	19.6	52	33	38	15.2	30.7	117	0.471	0.469	-0.002	0.144	-0.5
Western Wood-Pewee	90	226	254	12.4	10.4	31	39	22	-43.6	15.1 **	92	0.173	0.087	-0.086	0.040 **	-49.8
Eastern Wood-Pewee	75	103	115	11.7	20.2	11	11	8	-27.3	35.7	78	0.107	0.070	-0.037	0.053	-34.9
Acadian Flycatcher	83	415	386	-7.0	6.2	35	29	42	44.8	36.8	86	0.070	0.109	0.039	0.026	55.7
"Traill's" Flycatcher	135	539	525	-2.6	8.1	34	31	29	-6.5	22.6	140	0.058	0.055	-0.002	0.016	-4.0
Least Flycatcher	32	86	62	-27.9	19.3	15	20	7	-65.0	18.5 *	33	0.233	0.113	-0.120	0.073	-51.5
Hammond's Flycatcher	65	133	154	15.8	23.4	32	43	36	-16.3	21.0	71	0.323	0.234	-0.089	0.110	-27.7
Dusky Flycatcher	74	287	370	28.9	16.7 *	22	43	37	-14.0	31.6	77	0.150	0.100	-0.050	0.052	-33.3
"Western" Flycatcher	108	272	448	64.7	19.6 ***	69	138	119	-13.8	13.6	118	0.507	0.266	-0.242	0.107 **	-47.6
Black Phoebe	26	48	26	-45.8	13.4 **	32	100	44	-56.0	11.3 ***	38	2.083	1.692	-0.391	0.870	-18.8
Eastern Phoebe	39	38	47	23.7	25.2	38	40	82	105.0	63.3 *	56	1.053	1.745	0.692	0.509	65.7
Ash-throated Flycatcher	60	176	207	17.6	14.0	12	14	6	-57.1	32.5	60	0.079	0.029	-0.051	0.037	-63.6
Great Crested Flycatcher	59	66	62	-6.1	17.4	3	2	1	-50.0	75.0	60	0.030	0.016	-0.014	0.027	-46.8
White-eyed Vireo	82	436	457	4.8	9.4	61	262	269	2.7	11.8	86	0.601	0.589	-0.012	0.147	-2.0
Bell's Vireo	15	76	74	-2.6	22.5	12	20	17	-15.0	27.3	16	0.263	0.230	-0.033	0.103	-12.7
Cassin's Vireo	44	66	82	24.2	21.7	28	26	27	3.8	38.5	49	0.394	0.329	-0.065	0.141	-16.4
Hutton's Vireo	28	25	29	16.0	34.3	22	27	18	-33.3	17.8	37	1.080	0.621	-0.459	0.410	-42.5
Warbling Vireo	131	541	658	21.6	10.7 **	49	113	44	-61.1	9.2 ***	136	0.209	0.067	-0.142	0.053 ***	-68.0
Red-eyed Vireo	156	581	603	3.8	7.6	50	50	34	-32.0	17.8	158	0.086	0.056	-0.030	0.019	-34.5
Blue Jay	90	123	116	-5.7	12.8	26	30	20	-33.3	23.8	93	0.244	0.172	-0.072	0.082	-29.3
Western Scrub-Jay	35	29	39	34.5	33.5	22	26	17	-34.6	22.9	44	0.897	0.436	-0.461	0.331	-51.4
Tree Swallow	31	45	59	31.1	33.9	5	3	4	33.3	91.3	33	0.067	0.068	0.001	0.061	1.7
Carolina Chickadee	104	202	202	0.0	12.1	85	193	167	-13.5	13.2	113	0.955	0.827	-0.129	0.209	-13.5
Black-capped Chickadee	141	459	473	3.1	8.2	116	439	317	-27.8	7.4 ***	148	0.956	0.670	-0.286	0.137 **	-29.9

TABLE 1. Continued.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2001	2002	%chg.	SE[b]	n[c]	2001	2002	%chg.	SE[d]	n[e]	2001	2002	change	SE[f]	%chg.
Mountain Chickadee	46	121	152	25.6	19.2	43	114	138	21.1	29.5	51	0.942	0.908	-0.034	0.272	-3.6
Chestnut-backed Chick.	58	166	172	3.6	14.8	42	145	164	13.1	22.8	62	0.874	0.953	0.080	0.327	9.2
Oak Titmouse	22	52	49	-5.8	18.8	18	60	37	-38.3	20.7	24	1.154	0.755	-0.399	0.404	-34.6
Tufted Titmouse	141	348	366	5.2	7.6	134	398	363	-8.8	8.6	151	1.144	0.992	-0.152	0.134	-13.3
Black-crested Titmouse	14	28	31	10.7	33.1	13	44	62	40.9	28.0 *	15	1.571	2.000	0.429	0.648	27.3
Bushtit	78	327	565	72.8	25.8 ***	65	317	279	-12.0	17.2	83	0.969	0.494	-0.476	0.208 **	-49.1
Red-breasted Nuthatch	64	80	93	16.3	21.2	44	67	85	26.9	32.8	74	0.838	0.914	0.077	0.364	9.1
White-breasted Nuthatch	70	64	87	35.9	24.2 *	49	47	37	-21.3	21.2	95	0.734	0.425	-0.309	0.222	-42.1
Brown Creeper	83	95	89	-6.3	12.7	70	96	94	-2.1	16.9	101	1.011	1.056	0.046	0.223	4.5
Carolina Wren	120	475	534	12.4	7.3 *	118	440	518	17.7	10.3 *	136	0.926	0.970	0.044	0.149	4.7
Bewick's Wren	93	368	377	2.4	9.5	90	512	353	-31.1	8.8 ***	100	1.391	0.936	-0.455	0.167 ***	-32.7
House Wren	98	434	449	3.5	8.4	102	412	258	-37.4	9.0 ***	119	0.949	0.575	-0.375	0.137 ***	-39.5
Winter Wren	44	134	89	-33.6	9.3 **	38	87	57	-34.5	17.0 **	56	0.649	0.640	-0.009	0.290	-1.4
Golden-crowned Kinglet	58	155	126	-18.7	11.7	51	334	222	-33.5	14.4 **	72	2.155	1.762	-0.393	0.743	-18.2
Ruby-crowned Kinglet	39	151	124	-17.9	12.5	21	87	62	-28.7	15.2	41	0.576	0.500	-0.076	0.176	-13.2
Blue-gray Gnatcatcher	60	85	102	20.0	16.5	33	60	35	-41.7	15.7 *	65	0.706	0.343	-0.363	0.160 **	-51.4
Eastern Bluebird	33	33	44	33.3	35.4	21	34	38	11.8	50.6	38	1.030	0.864	-0.167	0.395	-16.2
Veery	52	257	286	11.3	9.7	30	44	35	-20.5	18.8	53	0.171	0.122	-0.049	0.036	-28.5
Swainson's Thrush	137	1477	1622	9.8	5.9 *	77	302	257	-14.9	10.9	140	0.205	0.158	-0.046	0.039	-22.5
Hermit Thrush	77	222	236	6.3	9.2	56	102	105	2.9	17.8	87	0.460	0.445	-0.015	0.107	-3.2
Wood Thrush	120	701	859	22.5	7.1 ***	83	197	189	-4.1	12.1	122	0.281	0.220	-0.061	0.044	-21.7
American Robin	241	1062	1052	-0.9	4.5	140	340	341	0.3	10.3	248	0.320	0.324	0.004	0.049	1.2
Varied Thrush	29	55	36	-34.5	19.8	20	34	21	-38.2	17.5	35	0.618	0.583	-0.035	0.313	-5.6
Wrentit	50	469	816	74.0	18.6 ***	52	573	194	-66.1	7.5 ***	52	1.222	0.238	-0.984	0.147 ***	-80.5
Gray Catbird	133	1642	1645	0.2	4.8	89	728	567	-22.1	7.7 **	140	0.443	0.345	-0.099	0.066	-22.3
Northern Mockingbird	23	31	43	38.7	43.0	16	34	12	-64.7	25.5 **	28	1.097	0.279	-0.818	0.657	-74.6
Brown Thrasher	56	83	91	9.6	17.4	33	42	31	-26.2	19.4	61	0.506	0.341	-0.165	0.134	-32.7
California Thrasher	18	27	68	151.9	49.7 ***	13	43	2	-95.3	3.7 ***	18	1.593	0.029	-1.563	0.331 ***	-98.2
Cedar Waxwing	87	429	507	18.2	13.2	14	14	10	-28.6	34.1	88	0.033	0.020	-0.013	0.013	-39.6
Blue-winged Warbler	36	118	118	0.0	11.0	21	28	30	7.1	47.2	38	0.237	0.254	0.017	0.115	7.1
Tennessee Warbler	12	10	23	130.0	100.9 *	5	6	27	350.0	285.3	13	0.600	1.174	0.574	0.758	95.7
Orange-crowned Warbler	79	339	424	25.1	13.7 *	60	251	233	-7.2	19.0	88	0.740	0.550	-0.191	0.179	-25.8
Nashville Warbler	44	128	154	20.3	15.2	38	109	162	48.6	42.4	50	0.852	1.052	0.200	0.381	23.5
Virginia's Warbler	10	45	59	31.1	37.6	6	12	30	150.0	162.7	10	0.267	0.509	0.242	0.164	90.7
Lucy's Warbler	9	50	74	48.0	44.9	8	27	17	-37.0	36.3	9	0.540	0.230	-0.310	0.158 *	-57.5

TABLE 1. Continued.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2001	2002	%chg.	SE[b]	n[c]	2001	2002	%chg.	SE[d]	n[e]	2001	2002	change	SE[f]	%chg.
Northern Parula	33	73	47	-35.6	9.6 ***	12	9	17	88.9	70.1	37	0.123	0.362	0.238	0.142 *	193.4
Yellow Warbler	150	1529	1620	6.0	5.2	96	452	454	0.4	12.8	157	0.296	0.280	-0.015	0.048	-5.2
Chestnut-sided Warbler	24	45	57	26.7	28.0	13	17	10	-41.2	20.8 *	25	0.378	0.175	-0.202	0.107 *	-53.6
Magnolia Warbler	20	86	85	-1.2	11.7	12	26	30	15.4	52.7	20	0.302	0.353	0.051	0.128	16.7
Yellow-rumped Warbler	104	472	577	22.2	11.5 **	71	319	484	51.7	52.8	112	0.676	0.839	0.163	0.431	24.1
Black-thrtd. Gray Warbler	27	25	37	48.0	47.5	20	21	20	-4.8	34.7	38	0.840	0.541	-0.300	0.396	-35.7
Black-thrtd. Green Warb.	23	63	59	-6.3	11.6	10	13	8	-38.5	38.8	24	0.206	0.136	-0.071	0.107	-34.3
Townsend's Warbler	27	114	113	-0.9	11.3	17	58	68	17.2	39.3	28	0.509	0.602	0.093	0.275	18.3
Hermit Warbler	34	146	152	4.1	16.7	28	72	154	113.9	81.2 *	36	0.493	1.013	0.520	0.333	105.4
Pine Warbler	19	32	40	25.0	28.7	11	18	31	72.2	53.8	22	0.563	0.775	0.213	0.498	37.8
Prairie Warbler	24	100	79	-21.0	15.5	19	36	21	-41.7	16.1 *	26	0.360	0.266	-0.094	0.096	-26.2
Black-and-white Warbler	83	151	163	7.9	15.5	54	98	71	-27.6	15.3	94	0.649	0.436	-0.213	0.129 *	-32.9
American Redstart	84	484	483	-0.2	7.4	39	146	118	-19.2	18.8	88	0.302	0.244	-0.057	0.095	-19.0
Prothonotary Warbler	25	95	112	17.9	20.9	16	27	12	-55.6	20.1 **	30	0.284	0.107	-0.177	0.109	-62.3
Worm-eating Warbler	57	155	132	-14.8	13.2	34	125	78	-37.6	10.6 *	62	0.807	0.591	-0.216	0.301	-26.7
Ovenbird	136	601	573	-4.7	6.0	89	280	268	-4.3	10.4	146	0.466	0.468	0.002	0.086	0.4
Northern Waterthrush	19	85	67	-21.2	18.9	14	36	19	-47.2	8.8 ***	26	0.424	0.284	-0.140	0.165	-33.0
Louisiana Waterthrush	61	98	114	16.3	13.3	38	98	72	-26.5	16.0	66	1.000	0.632	-0.368	0.292	-36.8
Kentucky Warbler	64	309	318	2.9	8.7	50	145	138	-4.8	13.1	69	0.469	0.434	-0.035	0.078	-7.5
MacGillivray's Warbler	122	830	1026	23.6	7.4 ***	86	499	282	-43.5	6.5 ***	130	0.601	0.275	-0.326	0.088 ***	-54.3
Common Yellowthroat	205	1456	1595	9.5	5.2 *	130	809	435	-46.2	9.9 ***	215	0.556	0.273	-0.283	0.080 ***	-50.9
Hooded Warbler	62	207	211	1.9	9.9	36	69	51	-26.1	18.2	67	0.333	0.242	-0.092	0.096	-27.5
Wilson's Warbler	132	865	1065	23.1	17.2	78	482	347	-28.0	8.9 ***	135	0.557	0.326	-0.231	0.126 *	-41.5
Canada Warbler	18	47	34	-27.7	15.2	14	14	14	0.0	40.6	24	0.298	0.412	0.114	0.202	38.2
Yellow-breasted Chat	85	591	589	-0.3	6.0	43	149	119	-20.1	14.0	87	0.252	0.202	-0.050	0.051	-19.9
Summer Tanager	68	121	133	9.9	18.5	19	16	13	-18.8	39.3	71	0.132	0.098	-0.035	0.054	-26.1
Scarlet Tanager	67	83	86	3.6	16.3	19	32	18	-43.8	31.8	69	0.386	0.209	-0.176	0.146	-45.7
Western Tanager	112	283	360	27.2	12.0 **	48	107	116	8.4	31.3	117	0.378	0.322	-0.056	0.124	-14.8
Green-tailed Towhee	22	62	68	9.7	20.5	21	44	48	9.1	24.8	28	0.710	0.706	-0.004	0.289	-0.5
Spotted Towhee	91	551	679	23.2	10.0 **	83	414	307	-25.8	15.0	97	0.751	0.452	-0.299	0.132 **	-39.8
Eastern Towhee	77	135	140	3.7	10.0	44	49	43	-12.2	18.1	84	0.363	0.307	-0.056	0.081	-15.4
California Towhee	33	139	177	27.3	21.3	24	104	4	-96.2	2.2 ***	35	0.748	0.023	-0.726	0.142 ***	-97.0
Rufous-crowned Sparrow	19	37	44	18.9	25.0	18	56	11	-80.4	14.4 **	23	1.514	0.250	-1.264	0.477 ***	-83.5
Chipping Sparrow	83	169	226	33.7	16.5 **	44	75	61	-18.7	16.4	94	0.444	0.270	-0.174	0.106	-39.2
Clay-colored Sparrow	3	50	25	-50.0	3.0 ***	3	18	11	-38.9	8.4	4	0.360	0.440	0.080	0.064	22.2

TABLE 1. Continued.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2001	2002	%chg.	SE[b]	n[c]	2001	2002	%chg.	SE[d]	n[e]	2001	2002	change	SE[f]	%chg.
Brewer's Sparrow	26	38	66	73.7	53.0 *	20	35	37	5.7	42.8	29	0.921	0.561	-0.360	0.304	-39.1
Field Sparrow	48	182	180	-1.1	10.0	29	105	40	-61.9	10.4 **	48	0.577	0.222	-0.355	0.138 **	-61.5
Lark Sparrow	28	74	58	-21.6	26.0	12	9	18	100.0	71.5 *	28	0.122	0.310	0.189	0.121	155.2
Sage Sparrow	5	22	6	-72.7	21.7 **	2	99	0	-100.0	0.0	5	4.500	0.000	-4.500	1.412 **	-100.0
Savannah Sparrow	12	84	99	17.9	9.4	13	17	19	11.8	38.5	17	0.202	0.192	-0.011	0.154	-5.2
Fox Sparrow	44	128	151	18.0	12.0 *	29	46	34	-26.1	18.7	51	0.359	0.225	-0.134	0.134	-37.3
Song Sparrow	192	2027	2006	-1.0	3.6	186	1822	1424	-21.8	6.2 ***	209	0.899	0.710	-0.189	0.086 **	-21.0
Lincoln's Sparrow	52	279	298	6.8	10.3	45	161	146	-9.3	16.1	59	0.577	0.490	-0.087	0.155	-15.1
Swamp Sparrow	12	46	49	6.5	27.0	6	61	34	-44.3	25.4	12	1.326	0.694	-0.632	0.504	-47.7
White-throated Sparrow	20	82	56	-31.7	8.6 **	16	30	15	-50.0	19.6 *	23	0.366	0.268	-0.098	0.171	-26.8
White-crowned Sparrow	32	117	105	-10.3	14.3	16	117	82	-29.9	16.0	32	1.000	0.781	-0.219	0.463	-21.9
Dark-eyed Junco	106	702	878	25.1	7.0 ***	110	788	691	-12.3	12.5	121	1.123	0.787	-0.336	0.207	-29.9
Northern Cardinal	172	955	1176	23.1	5.8 ***	142	604	504	-16.6	8.0 *	175	0.633	0.429	-0.204	0.078 ***	-32.2
Rose-breasted Grosbeak	44	123	93	-24.4	11.4	20	24	15	-37.5	16.1 *	46	0.195	0.161	-0.034	0.076	-17.3
Black-headed Grosbeak	128	506	526	4.0	8.1	75	190	108	-43.2	10.7 ***	132	0.376	0.205	-0.170	0.082 **	-45.3
Blue Grosbeak	29	53	49	-7.5	15.7	7	9	3	-66.7	39.6	31	0.170	0.061	-0.109	0.090	-63.9
Lazuli Bunting	83	258	256	-0.8	13.4	33	79	53	-32.9	19.9	85	0.306	0.207	-0.099	0.083	-32.4
Indigo Bunting	112	619	600	-3.1	7.0	56	85	62	-27.1	16.8	112	0.137	0.103	-0.034	0.031	-24.7
Painted Bunting	25	288	235	-18.4	19.0	22	86	142	65.1	44.6 *	25	0.299	0.604	0.306	0.105 ***	102.4
Red-winged Blackbird	63	327	260	-20.5	14.4	18	18	27	50.0	55.3	64	0.055	0.104	0.049	0.042	88.7
Common Grackle	45	104	101	-2.9	23.8	14	24	12	-50.0	25.9 *	46	0.231	0.119	-0.112	0.114	-48.5
Brown-headed Cowbird	167	312	316	1.3	9.7	52	44	23	-47.7	14.9 **	184	0.141	0.073	-0.068	0.031 **	-48.4
Orchard Oriole	19	52	63	21.2	41.9	11	31	12	-61.3	14.1 ***	19	0.596	0.191	-0.406	0.135 ***	-68.0
Bullock's Oriole	66	195	189	-3.1	14.0	35	58	48	-17.2	38.7	70	0.297	0.254	-0.044	0.112	-14.6
Baltimore Oriole	43	109	91	-16.5	13.0	17	30	49	63.3	89.3	48	0.275	0.539	0.263	0.258	95.6
Purple Finch	64	402	262	-34.8	10.5 ***	43	186	123	-33.9	13.5 *	68	0.463	0.470	0.007	0.113	1.5
Cassin's Finch	33	52	38	-26.9	21.4	16	15	12	-20.0	47.0	37	0.289	0.316	0.027	0.142	9.5
House Finch	61	178	267	50.0	29.3 *	49	223	246	10.3	33.8	68	1.253	0.921	-0.332	0.469	-26.5
Pine Siskin	59	222	146	-34.2	15.0 *	31	100	101	1.0	38.8	62	0.451	0.692	0.241	0.343	53.6
Lesser Goldfinch	57	296	219	-26.0	13.2	35	200	76	-62.0	22.0 ***	60	0.676	0.347	-0.329	0.387	-48.6
American Goldfinch	133	916	940	2.6	6.2	15	17	14	-17.6	50.0	133	0.019	0.015	-0.004	0.011	-19.8
Evening Grosbeak	17	54	77	42.6	35.0	5	5	4	-20.0	88.8	19	0.093	0.052	-0.041	0.072	-43.9
All species pooled	**417**	**37187**	**40261**	**8.3**	**1.8 *** **	**415**	**19154**	**15432**	**-19.4**	**3.2 *** **	**417**	**0.515**	**0.383**	**-0.132**	**0.026 *** **	**-25.6**
	Number increasing: 84/133 (63%)***					Number decreasing 96/133 (72%)***					Number decreasing: 104/133 (78%)***					

TABLE 1. Continued.

Species	ADULTS n[a]	2001	2002	%chg.	SE[b]	YOUNG n[c]	2001	2002	%chg.	SE[d]	REPRODUCTIVE INDEX n[e]	2001	2002	change	SE[f]	%chg.
NORTHWEST MAPS REGION																
Red-naped Sapsucker	30	59	54	-8.5	13.1	18	18	16	-11.1	25.5	31	0.305	0.296	-0.009	0.102	-2.9
Red-breasted Sapsucker	57	129	134	3.9	12.7	36	85	75	-11.8	20.2	58	0.659	0.560	-0.099	0.137	-15.1
Downy Woodpecker	52	69	53	-23.2	12.8	37	30	44	46.7	35.3	64	0.435	0.830	0.395	0.202 *	90.9
Hairy Woodpecker	60	47	45	-4.3	17.0	35	29	19	-34.5	21.7	75	0.617	0.422	-0.195	0.192	-31.6
Western Wood-Pewee	64	189	189	0.0	9.5	28	37	20	-45.9	14.9 **	66	0.196	0.106	-0.090	0.046 *	-45.9
"Traill's" Flycatcher	78	329	287	-12.8	9.6	18	12	17	41.7	47.9	81	0.037	0.059	0.023	0.019	62.4
Hammond's Flycatcher	60	130	136	4.6	19.0	32	43	36	-16.3	21.0	66	0.331	0.265	-0.066	0.116	-20.0
Dusky Flycatcher	65	275	312	13.5	14.1	20	41	34	-17.1	32.3	68	0.149	0.109	-0.040	0.055	-26.9
"Western" Flycatcher	72	192	202	5.2	13.7	50	94	73	-22.3	15.3	80	0.490	0.361	-0.128	0.130	-26.2
Cassin's Vireo	42	66	80	21.2	21.3	27	25	27	8.0	40.6	47	0.379	0.338	-0.041	0.142	-10.9
Warbling Vireo	99	479	528	10.2	9.2	36	89	30	-66.3	9.5 **	100	0.186	0.057	-0.129	0.057 **	-69.4
Black-capped Chickadee	54	147	185	25.9	13.7 **	49	189	134	-29.1	12.0 *	59	1.286	0.724	-0.561	0.240 **	-43.7
Mountain Chickadee	44	118	152	28.8	19.7	42	113	137	21.2	29.8	49	0.958	0.901	-0.056	0.276	-5.9
Chestnut-backed Chick.	51	145	157	8.3	16.5	35	84	93	10.7	28.8	55	0.579	0.592	0.013	0.196	2.3
Bushtit	33	61	68	11.5	29.3	26	103	113	9.7	33.7	37	1.689	1.662	-0.027	0.578	-1.6
Red-breasted Nuthatch	55	75	89	18.7	22.4	39	62	84	35.5	35.3	61	0.827	0.944	0.117	0.382	14.2
Brown Creeper	63	81	80	-1.2	14.1	59	83	91	9.6	19.9	74	1.025	1.138	0.113	0.244	11.0
Bewick's Wren	27	61	56	-8.2	16.8	26	95	73	-23.2	14.6	31	1.557	1.304	-0.254	0.392	-16.3
House Wren	26	68	114	67.6	29.3 **	35	92	70	-23.9	15.2	38	1.353	0.614	-0.739	0.327 **	-54.6
Winter Wren	35	129	82	-36.4	9.1 ***	35	83	57	-31.3	17.3 **	44	0.643	0.695	0.052	0.306	8.0
Golden-crowned Kinglet	49	146	108	-26.0	11.2 *	44	320	219	-31.6	14.9 *	61	2.192	2.028	-0.164	0.826	-7.5
Ruby-crowned Kinglet	29	114	104	-8.8	15.4	16	69	51	-26.1	18.1	31	0.605	0.490	-0.115	0.213	-19.0
Swainson's Thrush	97	1275	1277	0.2	4.7	54	235	204	-13.2	13.7	98	0.184	0.160	-0.025	0.040	-13.3
Hermit Thrush	42	90	101	12.2	15.0	30	45	59	31.1	31.8	47	0.500	0.584	0.084	0.209	16.8
American Robin	119	619	571	-7.8	5.3	72	160	149	-6.9	13.4	121	0.259	0.261	0.003	0.054	1.0
Varied Thrush	24	42	25	-40.5	22.9	17	30	18	-40.0	15.3 **	30	0.714	0.720	0.006	0.411	0.8
Wrentit	21	77	90	16.9	23.2	23	140	76	-45.7	12.0 **	23	1.818	0.844	-0.974	0.323 ***	-53.6
Gray Catbird	16	157	137	-12.7	10.3	10	37	20	-45.9	19.8	16	0.236	0.146	-0.090	0.083	-38.1
Cedar Waxwing	40	209	264	26.3	15.0 *	5	5	7	40.0	80.7	40	0.024	0.027	0.003	0.020	10.8
Orange-crowned Warbler	48	169	205	21.3	13.6 *	34	78	124	59.0	34.1 **	55	0.462	0.605	0.143	0.169	31.1
Nashville Warbler	28	95	121	27.4	19.0 *	30	94	128	36.2	47.0	34	0.989	1.058	0.068	0.445	6.9
Virginia's Warbler	3	28	39	39.3	23.2	2	5	20	300.0	80.0	3	0.179	0.513	0.334	0.224	187.2
Yellow Warbler	76	930	982	5.6	6.3	56	334	318	-4.8	13.8	80	0.359	0.324	-0.035	0.069	-9.8
Yellow-rumped Warbler	73	398	496	24.6	13.2 **	52	288	461	60.1	57.6	78	0.724	0.929	0.206	0.500	28.4

TABLE 1. Continued.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2001	2002	%chg.	SE[b]	n[c]	2001	2002	%chg.	SE[d]	n[e]	2001	2002	change	SE[f]	%chg.
Townsend's Warbler	25	107	109	1.9	12.0	15	58	64	10.3	37.5	26	0.542	0.587	0.045	0.287	8.3
Hermit Warbler	34	146	152	4.1	16.7	28	72	154	113.9	81.2 *	36	0.493	1.013	0.520	0.333	105.4
American Redstart	12	94	99	5.3	9.2	5	8	12	50.0	68.5	12	0.085	0.121	0.036	0.080	42.4
Northern Waterthrush	8	56	50	-10.7	25.2	4	15	6	-60.0	9.0 ***	8	0.268	0.120	-0.148	0.111	-55.2
MacGillivray's Warbler	103	806	950	17.9	6.4 ***	84	497	280	-43.7	6.5 ***	110	0.617	0.295	-0.322	0.092 ***	-52.2
Common Yellowthroat	45	271	280	3.3	8.4	27	105	130	23.8	11.5	47	0.388	0.464	0.077	0.151	19.8
Wilson's Warbler	108	716	756	5.6	16.3	61	270	169	-37.4	11.1 ***	111	0.377	0.224	-0.154	0.093 *	-40.7
Yellow-breasted Chat	21	140	121	-13.6	8.4	12	42	51	21.4	41.5	22	0.300	0.422	0.122	0.147	40.5
Western Tanager	91	251	314	25.1	12.2 **	44	100	111	11.0	34.0	94	0.398	0.354	-0.045	0.139	-11.3
Green-tailed Towhee	17	59	60	1.7	18.8	20	43	46	7.0	25.2	23	0.729	0.767	0.038	0.323	5.2
Spotted Towhee	48	216	257	19.0	12.1 *	45	166	162	-2.4	10.8	54	0.769	0.630	-0.138	0.181	-18.0
Chipping Sparrow	42	101	138	36.6	20.5 **	24	44	42	-4.5	22.9	50	0.436	0.304	-0.131	0.158	-30.1
Brewer's Sparrow	19	34	56	64.7	54.6	17	30	35	16.7	49.4	22	0.882	0.625	-0.257	0.322	-29.2
Savannah Sparrow	7	78	93	19.2	10.1	7	14	12	-14.3	35.7	8	0.180	0.129	-0.051	0.128	-28.1
Fox Sparrow	41	106	128	20.8	14.7 *	24	39	27	-30.8	20.6	46	0.368	0.211	-0.157	0.149	-42.7
Song Sparrow	106	1176	1105	-6.0	4.6	110	1022	917	-10.3	6.4	119	0.869	0.830	-0.039	0.104	-4.5
Lincoln's Sparrow	47	269	282	4.8	10.3	40	155	142	-8.4	16.7	51	0.576	0.504	-0.073	0.162	-12.6
White-crowned Sparrow	24	81	82	1.2	19.0	11	30	29	-3.3	50.8	24	0.370	0.354	-0.017	0.168	-4.5
Dark-eyed Junco	82	637	797	25.1	7.5 ***	86	679	555	-18.3	12.4	91	1.066	0.696	-0.370	0.211 *	-34.7
Black-headed Grosbeak	82	279	303	8.6	10.2	48	133	77	-42.1	12.3 **	84	0.477	0.254	-0.223	0.130 *	-46.7
Lazuli Bunting	59	196	211	7.7	14.5	28	67	53	-20.9	24.3	60	0.342	0.251	-0.091	0.096	-26.5
Red-winged Blackbird	26	183	119	-35.0	18.2	7	9	15	66.7	76.1	27	0.049	0.126	0.077	0.072	156.3
Brown-headed Cowbird	62	141	126	-10.6	12.9	19	20	5	-75.0	13.7 ***	66	0.142	0.040	-0.102	0.042 **	-72.0
Bullock's Oriole	32	112	116	3.6	21.8	21	36	40	11.1	66.1	35	0.321	0.345	0.023	0.170	7.3
Purple Finch	44	363	226	-37.7	10.3 ***	32	162	111	-31.5	15.4	46	0.446	0.491	0.045	0.122	10.1
Cassin's Finch	32	51	38	-25.5	22.1	16	15	12	-20.0	47.0	36	0.294	0.316	0.022	0.144	7.4
House Finch	12	15	42	180.0	89.8 *	11	33	42	27.3	74.0	15	2.200	1.000	-1.200	1.308	-54.5
Pine Siskin	54	209	142	-32.1	15.9	31	100	101	1.0	38.8	57	0.479	0.711	0.233	0.354	48.7
Lesser Goldfinch	21	87	60	-31.0	17.6	10	146	59	-59.6	31.7 *	22	1.678	0.983	-0.695	1.171	-41.4
American Goldfinch	31	207	189	-8.7	11.6	8	13	7	-46.2	44.5	31	0.063	0.037	-0.026	0.048	-41.0
Evening Grosbeak	17	54	77	42.6	35.0	5	5	4	-20.0	88.8	19	0.093	0.052	-0.041	0.072	-43.9
All species pooled	**135**	**14850**	**15484**	**4.3**	**2.6 ***	**135**	**7598**	**6760**	**-11.0**	**5.1 ****	**135**	**0.512**	**0.437**	**-0.075**	**0.045 ***	**-14.7**
	Number increasing: 42/65 (65%)**					Number decreasing: 39/65 (60%)*					Number decreasing: 40/65 (62%)**					
SOUTHWEST MAPS REGION																
Nuttall's Woodpecker	26	50	53	6.0	18.3	25	47	36	-23.4	18.4	29	0.940	0.679	-0.261	0.228	-27.7

TABLE 1. Continued.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2001	2002	%chg.	SE[b]	n[c]	2001	2002	%chg.	SE[d]	n[e]	2001	2002	change	SE[f]	%chg.
Downy Woodpecker	19	46	35	-23.9	18.7	16	20	28	40.0	44.2	20	0.435	0.800	0.365	0.284	84.0
Western Wood-Pewee	24	26	60	130.8	59.6 ***	3	2	2	0.0	150.0	24	0.077	0.033	-0.044	0.086	-56.7
Dusky Flycatcher	9	12	58	383.3	216.6	2	2	3	50.0	100.0	9	0.167	0.052	-0.115	0.170	-69.0
"Western" Flycatcher	36	80	246	207.5	56.4 ***	19	44	46	4.5	28.9	38	0.550	0.187	-0.363	0.225	-66.0
Black Phoebe	21	43	23	-46.5	14.6 **	24	72	29	-59.7	13.5 ***	30	1.674	1.261	-0.414	0.768	-24.7
Ash-throated Flycatcher	51	160	190	18.8	14.8	11	14	5	-64.3	29.8	51	0.088	0.026	-0.061	0.040	-69.9
Warbling Vireo	18	33	113	242.4	129.7 *	8	21	7	-66.7	15.7 *	21	0.636	0.062	-0.574	0.212 ***	-90.3
Chestnut-backed Chick.	7	21	15	-28.6	21.2	7	61	71	16.4	39.7	7	2.905	4.733	1.829	1.109	63.0
Oak Titmouse	21	51	49	-3.9	19.3	16	51	34	-33.3	24.3	21	1.000	0.694	-0.306	0.368	-30.6
Bushtit	44	266	495	86.1	31.7 ***	39	214	166	-22.4	21.0	45	0.805	0.335	-0.469	0.184 **	-58.3
Bewick's Wren	50	256	262	2.3	12.4	50	370	205	-44.6	9.2 ***	52	1.445	0.782	-0.663	0.191 ***	-45.9
House Wren	32	192	177	-7.8	9.9	30	154	106	-31.2	19.6	33	0.802	0.599	-0.203	0.222	-25.3
Swainson's Thrush	16	117	241	106.0	47.1 ***	9	50	35	-30.0	12.2	16	0.427	0.145	-0.282	0.169	-66.0
American Robin	24	40	51	27.5	38.9	8	6	3	-50.0	39.8	26	0.150	0.059	-0.091	0.068	-60.8
Wrentit	29	392	726	85.2	21.5 ***	29	433	118	-72.7	8.7 ***	29	1.105	0.163	-0.942	0.146 ***	-85.3
California Thrasher	18	27	68	151.9	49.7 ***	13	43	2	-95.3	3.7 ***	18	1.593	0.029	-1.563	0.331 ***	-98.2
Orange-crowned Warbler	25	126	170	34.9	29.7	21	129	59	-54.3	21.0 *	27	1.024	0.347	-0.677	0.298 **	-66.1
Lucy's Warbler	9	50	74	48.0	44.9	8	27	17	-37.0	36.3	9	0.540	0.230	-0.310	0.158 *	-57.5
Yellow Warbler	29	126	203	61.1	28.5 **	11	28	11	-60.7	17.3 *	29	0.222	0.054	-0.168	0.066 **	-75.6
MacGillivray's Warbler	19	24	76	216.7	139.9 *	2	2	2	0.0	200.0	20	0.083	0.026	-0.057	0.067	-68.4
Common Yellowthroat	38	471	566	20.2	12.5 *	30	432	107	-75.2	7.9 **	40	0.917	0.189	-0.728	0.160 ***	-79.4
Wilson's Warbler	13	77	247	220.8	90.4 ***	9	103	94	-8.7	21.8	13	1.338	0.381	-0.957	0.559	-71.5
Yellow-breasted Chat	23	200	236	18.0	12.0	11	42	16	-61.9	14.7 ***	23	0.210	0.068	-0.142	0.049 ***	-67.7
Spotted Towhee	43	335	422	26.0	14.7 **	38	248	145	-41.5	23.3 *	43	0.740	0.344	-0.397	0.181 **	-53.6
California Towhee	31	136	173	27.2	21.7	23	102	3	-97.1	1.9 ***	33	0.750	0.017	-0.733	0.145 ***	-97.7
Rufous-crowned Sparrow	14	33	37	12.1	24.8	15	56	1	-98.2	1.9 ***	18	1.697	0.027	-1.670	0.508 ***	-98.4
Lark Sparrow	14	42	44	4.8	38.0	6	6	8	33.3	60.2	14	0.143	0.182	0.039	0.104	27.3
Sage Sparrow	2	21	2	-90.5	5.9	2	99	0	-100.0	0.0	2	4.714	0.000	-4.714	1.701	-100.0
Song Sparrow	39	547	567	3.7	6.9	37	582	338	-41.9	12.8 **	41	1.064	0.596	-0.468	0.202 **	-44.0
Black-headed Grosbeak	45	215	216	0.5	13.4	26	57	30	-47.4	21.3 *	47	0.265	0.139	-0.126	0.081	-47.6
Lazuli Bunting	24	62	45	-27.4	28.2	5	12	0	-100.0	0.0	25	0.194	0.000	-0.194	0.110 *	-100.0
Brown-headed Cowbird	27	74	75	1.4	23.4	5	6	2	-66.7	37.3	28	0.081	0.027	-0.054	0.061	-67.1
Bullock's Oriole	29	67	58	-13.4	18.7	10	17	6	-64.7	21.2 **	30	0.254	0.103	-0.150	0.125	-59.2
House Finch	37	151	211	39.7	32.8	30	184	198	7.6	38.7	39	1.219	0.938	-0.280	0.548	-23.0
Lesser Goldfinch	34	202	159	-21.3	18.3	25	54	17	-68.5	16.2 **	36	0.267	0.107	-0.160	0.074 **	-60.0

TABLE 1. Continued.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2001	2002	%chg.	SE[b]	n[c]	2001	2002	%chg.	SE[d]	n[e]	2001	2002	change	SE[f]	%chg.
American Goldfinch	18	106	146	37.7	24.0	5	2	6	200.0	379.1	18	0.019	0.041	0.022	0.023	117.8
All species pooled	**59**	**5671**	**7565**	**33.4**	**6.8 *****	**58**	**4151**	**2126**	**-48.8**	**7.7 *****	**59**	**0.732**	**0.281**	**-0.451**	**0.075 *****	**-61.6**
	Number increasing: 28/37 (76%)***					Number decreasing: 28/37 (76%)***					Number decreasing: 33/37 (89%)***					
NORTH-CENTRAL MAPS REGION																
Downy Woodpecker	19	31	35	12.9	29.5	19	55	36	-34.5	11.1 **	22	1.774	1.029	-0.746	0.496	-42.0
"Traill's" Flycatcher	11	54	77	42.6	40.1	5	5	4	-20.0	55.1	12	0.093	0.052	-0.041	0.039	-43.9
Red-eyed Vireo	15	44	73	65.9	38.6	3	2	2	0.0	86.6	15	0.046	0.027	-0.018	0.031	-39.7
Black-capped Chickadee	23	80	89	11.3	24.4	19	109	71	-34.9	14.8 *	23	1.363	0.798	-0.565	0.368	-41.4
Tufted Titmouse	9	26	35	34.6	31.5	11	27	23	-14.8	25.6	12	1.039	0.657	-0.381	0.295	-36.7
House Wren	16	89	87	-2.2	18.3	13	98	44	-55.1	9.7 ***	16	1.101	0.506	-0.595	0.278 **	-54.1
Wood Thrush	13	63	63	0.0	11.0	8	18	18	0.0	35.6	13	0.286	0.286	0.000	0.090	0.0
American Robin	21	66	83	25.8	18.7	15	54	46	-14.8	19.4	21	0.818	0.554	-0.264	0.277	-32.3
Gray Catbird	21	362	329	-9.1	9.6	18	185	108	-41.6	7.9 ***	21	0.511	0.328	-0.183	0.143	-35.8
Cedar Waxwing	14	43	55	27.9	61.6	2	1	1	0.0	200.0	15	0.023	0.018	-0.005	0.033	-21.8
Yellow Warbler	11	184	165	-10.3	7.7	8	26	34	30.8	51.4	11	0.141	0.206	0.065	0.080	45.8
American Redstart	14	55	58	5.5	16.4	4	9	5	-44.4	19.4	14	0.164	0.086	-0.077	0.084	-47.3
Ovenbird	16	49	44	-10.2	15.8	5	13	19	46.2	57.6	16	0.265	0.432	0.167	0.202	62.8
Common Yellowthroat	16	210	204	-2.9	10.4	12	107	90	-15.9	10.7	16	0.510	0.441	-0.068	0.107	-13.4
Clay-colored Sparrow	2	50	24	-52.0	1.9	3	18	11	-38.9	8.4	3	0.360	0.458	0.098	0.078	27.3
Field Sparrow	9	59	50	-15.3	13.7	8	43	10	-76.7	13.0 ***	9	0.729	0.200	-0.529	0.164 **	-72.6
Song Sparrow	13	88	83	-5.7	11.6	12	52	47	-9.6	22.8	13	0.591	0.566	-0.025	0.261	-4.2
Swamp Sparrow	4	20	16	-20.0	7.8	1	41	12	-70.7		4	2.050	0.750	-1.300	0.319 **	-63.4
Northern Cardinal	17	52	70	34.6	14.6 ***	14	24	13	-45.8	21.5 *	18	0.462	0.186	-0.276	0.133 *	-59.8
Rose-breasted Grosbeak	16	74	49	-33.8	13.7 *	7	10	7	-30.0	24.6	16	0.135	0.143	0.008	0.103	5.7
Indigo Bunting	16	105	80	-23.8	14.5	8	15	2	-86.7	10.6 ***	16	0.143	0.025	-0.118	0.056 *	-82.5
Red-winged Blackbird	6	43	59	37.2	42.9	3	4	7	75.0	200.5	6	0.093	0.119	0.026	0.092	27.5
Baltimore Oriole	13	60	40	-33.3	16.2	7	24	13	-45.8	23.8	15	0.400	0.325	-0.075	0.184	-18.8
American Goldfinch	15	201	213	6.0	12.0	0	0	0			15	0.000	0.000	0.000		
All species pooled	**24**	**2565**	**2607**	**1.6**	**4.6**	**23**	**1104**	**784**	**-29.0**	**5.2 *****	**24**	**0.430**	**0.301**	**-0.130**	**0.057 ** **	**-30.1**
	Number increasing: 11/24 (46%)					Number decreasing: 17/24 (71%)**					Number decreasing: 17/24 (71%)**					
SOUTH-CENTRAL MAPS REGION																
Common Ground-Dove	7	57	49	-14.0	35.8	3	36	8	-77.8	24.7 *	7	0.632	0.163	-0.468	0.168 **	-74.1
Downy Woodpecker	21	26	43	65.4	44.9 **	20	37	31	-16.2	24.1	25	1.423	0.721	-0.702	0.391 *	-49.3

TABLE 1. Continued.

Species	ADULTS n[a]	2001	2002	%chg.	SE[b]	YOUNG n[c]	2001	2002	%chg.	SE[d]	REPRODUCTIVE INDEX n[e]	2001	2002	change	SE[f]	%chg.
Acadian Flycatcher	12	85	73	-14.1	8.6	5	6	14	133.3	110.4	13	0.071	0.192	0.121	0.052 **	171.7
White-eyed Vireo	27	258	275	6.6	14.3	25	187	208	11.2	13.7	27	0.725	0.756	0.032	0.221	4.4
Bell's Vireo	8	50	34	-32.0	19.3	7	13	13	0.0	33.2	9	0.260	0.382	0.122	0.167	47.1
Red-eyed Vireo	20	64	63	-1.6	18.3	8	5	8	60.0	66.0	20	0.078	0.127	0.049	0.074	62.5
Carolina Chickadee	29	63	64	1.6	23.8	28	62	71	14.5	28.5	33	0.984	1.109	0.125	0.457	12.7
Tufted Titmouse	25	70	82	17.1	18.8	24	72	88	22.2	28.9	25	1.029	1.073	0.045	0.327	4.3
Black-crested Titmouse	14	28	31	10.7	33.1	13	44	62	40.9	28.0 *	15	1.571	2.000	0.429	0.648	27.3
Carolina Wren	29	86	129	50.0	19.8 ***	24	122	197	61.5	18.6 ***	30	1.419	1.527	0.109	0.370	7.6
Bewick's Wren	16	51	59	15.7	25.7	14	47	75	59.6	60.3	17	0.922	1.271	0.350	0.492	37.9
Blue-gray Gnatcatcher	16	37	44	18.9	25.2	12	21	20	-4.8	35.4	19	0.568	0.455	-0.113	0.212	-19.9
Gray Catbird	9	87	69	-20.7	8.3 **	4	41	22	-46.3	17.4	10	0.471	0.319	-0.152	0.092	-32.3
Black-and-white Warbler	15	40	16	-60.0	13.8 **	16	23	22	-4.3	33.3	20	0.575	1.375	0.800	0.500	139.1
Prothonotary Warbler	8	62	67	8.1	18.0	6	10	8	-20.0	58.0	8	0.161	0.119	-0.042	0.112	-26.0
Kentucky Warbler	18	87	84	-3.4	21.2	15	35	40	14.3	29.9	20	0.402	0.476	0.074	0.155	18.4
Common Yellowthroat	13	38	38	0.0	31.2	7	12	9	-25.0	45.5	13	0.316	0.237	-0.079	0.240	-25.0
Yellow-breasted Chat	9	128	131	2.3	9.5	5	37	28	-24.3	20.9	9	0.289	0.214	-0.075	0.078	-26.1
Field Sparrow	15	62	66	6.5	18.6	11	50	20	-60.0	13.8 ***	15	0.807	0.303	-0.503	0.279 *	-62.4
Northern Cardinal	42	299	461	54.2	10.8 ***	41	308	321	4.2	11.5	43	1.030	0.696	-0.334	0.151 **	-32.4
Indigo Bunting	24	213	221	3.8	12.7	16	23	23	0.0	31.8	24	0.108	0.104	-0.004	0.042	-3.6
Painted Bunting	24	274	223	-18.6	19.9	21	82	138	68.3	47.3 *	24	0.299	0.619	0.320	0.110 ***	106.8
Brown-headed Cowbird	26	34	51	50.0	36.0	9	4	5	25.0	88.9	30	0.118	0.098	-0.020	0.073	-16.7
All species pooled	**45**	**2947**	**3038**	**3.1**	**5.8**	**45**	**1514**	**1688**	**11.5**	**11.6**	**45**	**0.514**	**0.556**	**0.042**	**0.077**	**8.2**
	Number increasing: 14/23 (61%)					Number increasing: 12/23 (52%)					Number increasing: 12/23 (52%)					
NORTHEAST MAPS REGION																
Downy Woodpecker	52	67	88	31.3	24.0	48	68	70	2.9	19.5	63	1.015	0.796	-0.220	0.279	-21.6
"Traill's" Flycatcher	18	95	105	10.5	19.0	7	11	5	-54.5	20.2	18	0.116	0.048	-0.068	0.041	-58.9
Eastern Phoebe	21	26	33	26.9	30.3	21	27	51	88.9	81.1	31	1.039	1.546	0.507	0.631	48.8
White-eyed Vireo	12	35	43	22.9	22.0	8	18	8	-55.6	23.4 *	13	0.514	0.186	-0.328	0.202	-63.8
Red-eyed Vireo	53	167	186	11.4	14.8	19	21	13	-38.1	27.8	55	0.126	0.070	-0.056	0.039	-44.4
Blue Jay	29	45	44	-2.2	22.5	8	8	7	-12.5	66.9	30	0.178	0.159	-0.019	0.122	-10.5
Carolina Chickadee	15	35	29	-17.1	34.0	12	19	7	-63.2	20.7 *	16	0.543	0.241	-0.302	0.236	-55.5
Black-capped Chickadee	53	210	178	-15.2	10.4	36	106	76	-28.3	11.3 **	53	0.505	0.427	-0.078	0.133	-15.4
Tufted Titmouse	44	90	67	-25.6	10.3 **	43	110	99	-10.0	18.1	50	1.222	1.478	0.255	0.394	20.9
Carolina Wren	27	97	110	13.4	14.4	24	43	71	65.1	40.8 *	32	0.443	0.646	0.202	0.197	45.6

TABLE 1. Continued.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2001	2002	%chg.	SE[b]	n[c]	2001	2002	%chg.	SE[d]	n[e]	2001	2002	change	SE[f]	%chg.
House Wren	14	56	51	-8.9	24.7	19	43	25	-41.9	24.8	21	0.768	0.490	-0.278	0.401	-36.2
Veery	39	186	218	17.2	12.6	21	33	20	-39.4	15.7 **	40	0.177	0.092	-0.086	0.038 **	-48.3
Hermit Thrush	23	87	81	-6.9	12.9	19	34	25	-26.5	22.8	27	0.391	0.309	-0.082	0.119	-21.0
Wood Thrush	46	202	283	40.1	16.8 **	27	57	58	1.8	21.7	47	0.282	0.205	-0.077	0.070	-27.4
American Robin	50	262	282	7.6	9.4	30	72	102	41.7	23.8 *	51	0.275	0.362	0.087	0.086	31.6
Gray Catbird	55	896	985	9.9	7.1	41	402	335	-16.7	10.7	56	0.449	0.340	-0.109	0.089	-24.2
Cedar Waxwing	26	171	165	-3.5	18.9	7	8	2	-75.0	29.4 *	26	0.047	0.012	-0.035	0.022	-74.1
Yellow Warbler	27	257	240	-6.6	10.2	15	52	88	69.2	39.4	28	0.202	0.367	0.164	0.105	81.2
Magnolia Warbler	15	70	71	1.4	11.9	8	17	26	52.9	68.1	15	0.243	0.366	0.123	0.133	50.8
Black-thrtd. Green Warb.	19	58	55	-5.2	10.3	8	11	8	-27.3	50.9	20	0.190	0.146	-0.044	0.116	-23.3
Black-and-white Warbler	36	61	72	18.0	24.9	18	41	26	-36.6	17.6 *	38	0.672	0.361	-0.311	0.162 *	-46.3
American Redstart	37	260	263	1.2	11.6	24	111	87	-21.6	21.9	39	0.427	0.331	-0.096	0.151	-22.5
Worm-eating Warbler	21	74	56	-24.3	20.6	10	91	50	-45.1	10.8 ***	21	1.230	0.893	-0.337	0.643	-27.4
Ovenbird	58	275	245	-10.9	7.5	33	103	73	-29.1	11.9 *	59	0.375	0.298	-0.077	0.094	-20.4
Common Yellowthroat	46	258	300	16.3	9.5 *	27	82	50	-39.0	16.7 *	47	0.318	0.167	-0.151	0.075 **	-47.6
Hooded Warbler	14	76	82	7.9	18.1	12	30	14	-53.3	19.3 *	17	0.395	0.171	-0.224	0.161	-56.7
Scarlet Tanager	26	39	40	2.6	24.8	7	19	10	-47.4	50.2	27	0.487	0.250	-0.237	0.260	-48.7
Eastern Towhee	31	83	75	-9.6	10.1	20	29	27	-6.9	21.2	33	0.349	0.360	0.011	0.109	3.0
Chipping Sparrow	20	45	41	-8.9	17.5	11	21	10	-52.4	22.7 **	22	0.467	0.244	-0.223	0.130 *	-47.7
Song Sparrow	30	200	225	12.5	13.8	25	159	109	-31.4	15.8	31	0.795	0.484	-0.311	0.181 *	-39.1
Swamp Sparrow	8	26	33	26.9	45.3	5	20	22	10.0	59.0	8	0.769	0.667	-0.103	0.445	-13.3
White-throated Sparrow	13	49	32	-34.7	12.2	10	18	13	-27.8	35.2	14	0.367	0.406	0.039	0.254	10.6
Dark-eyed Junco	14	41	44	7.3	16.5	12	71	78	9.9	49.2	15	1.732	1.773	0.041	1.281	2.4
Northern Cardinal	45	162	185	14.2	12.3	31	65	34	-47.7	13.5 ***	46	0.401	0.184	-0.218	0.074 ***	-54.2
Rose-breasted Grosbeak	25	41	36	-12.2	22.3	11	12	8	-33.3	25.7	26	0.293	0.222	-0.071	0.118	-24.1
Indigo Bunting	27	79	71	-10.1	19.9	11	19	11	-42.1	34.4	27	0.241	0.155	-0.086	0.145	-35.6
Red-winged Blackbird	16	54	37	-31.5	13.4 *	3	2	2	0.0	150.0	16	0.037	0.054	0.017	0.062	45.9
Common Grackle	18	44	41	-6.8	27.1	6	6	7	16.7	40.4	18	0.136	0.171	0.034	0.106	25.2
Baltimore Oriole	23	29	41	41.4	39.6 *	7	3	12	300.0	216.0	24	0.103	0.293	0.189	0.152	182.9
American Goldfinch	39	288	266	-7.6	10.3	1	0	1	++++		39	0.000	0.004	0.004	0.003	++++
All species pooled	**73**	**5948**	**6235**	**4.8**	**3.8**	**73**	**2273**	**1885**	**-17.1**	**5.7 *****	**73**	**0.382**	**0.302**	**-0.080**	**0.034 ****	**-20.9**
	Number increasing: 21/40 (52%)					Number decreasing: 27/40 (68%)**					Number decreasing: 27/40 (68%)**					
SOUTHEAST MAPS REGION																
Downy Woodpecker	45	59	61	3.4	20.3	44	84	60	-28.6	13.1 **	57	1.424	0.984	-0.440	0.324	-30.9

TABLE 1. Continued.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2001	2002	%chg.	SE[b]	n[c]	2001	2002	%chg.	SE[d]	n[e]	2001	2002	change	SE[f]	%chg.
Acadian Flycatcher	53	305	274	-10.2	7.5	22	19	21	10.5	37.2	53	0.062	0.077	0.014	0.027	23.0
White-eyed Vireo	42	141	139	-1.4	11.8	28	57	53	-7.0	21.5	45	0.404	0.381	-0.023	0.141	-5.7
Red-eyed Vireo	54	268	256	-4.5	10.8	19	21	11	-47.6	25.2	54	0.078	0.043	-0.035	0.028	-45.2
Blue Jay	42	51	39	-23.5	15.9	11	8	9	12.5	66.1	43	0.157	0.231	0.074	0.123	47.1
Carolina Chickadee	60	104	109	4.8	15.1	45	112	89	-20.5	16.5	64	1.077	0.816	-0.260	0.295	-24.2
Tufted Titmouse	63	162	182	12.3	11.9	56	189	153	-19.0	10.1 *	64	1.167	0.841	-0.326	0.165 **	-27.9
Carolina Wren	61	290	290	0.0	9.1	64	261	234	-10.3	11.0	68	0.900	0.807	-0.093	0.174	-10.3
Wood Thrush	55	419	507	21.0	8.3 ***	45	119	110	-7.6	15.9	55	0.284	0.217	-0.067	0.063	-23.6
American Robin	18	60	56	-6.7	19.6	13	45	38	-15.6	38.0	20	0.750	0.679	-0.071	0.456	-9.5
Gray Catbird	31	139	125	-10.1	11.1	16	63	82	30.2	30.4	36	0.453	0.656	0.203	0.326	44.7
Brown Thrasher	26	34	48	41.2	33.7	17	24	14	-41.7	16.8 **	28	0.706	0.292	-0.414	0.211 **	-58.7
Blue-winged Warbler	10	34	33	-2.9	22.0	9	18	16	-11.1	61.5	11	0.529	0.485	-0.045	0.363	-8.4
Northern Parula	16	44	36	-18.2	13.0	7	6	14	133.3	93.7	18	0.136	0.389	0.253	0.184	185.2
Prairie Warbler	17	74	60	-18.9	18.9	15	32	14	-56.3	14.5 **	19	0.432	0.233	-0.199	0.117	-46.0
Black-and-white Warbler	24	33	55	66.7	37.2 **	15	16	19	18.8	52.6	28	0.485	0.346	-0.139	0.215	-28.8
Worm-eating Warbler	28	68	62	-8.8	16.8	20	27	26	-3.7	29.5	32	0.397	0.419	0.022	0.118	5.6
Ovenbird	52	240	255	6.3	11.7	43	153	164	7.2	16.0	56	0.638	0.643	0.006	0.162	0.9
Louisiana Waterthrush	33	56	70	25.0	16.8	24	57	43	-24.6	20.4	38	1.018	0.614	-0.404	0.269	-39.6
Kentucky Warbler	37	194	197	1.5	9.0	30	106	87	-17.9	13.0	38	0.546	0.442	-0.105	0.096	-19.2
Common Yellowthroat	45	207	205	-1.0	10.4	26	70	49	-30.0	14.2	49	0.338	0.239	-0.099	0.078	-29.3
Hooded Warbler	39	102	98	-3.9	8.9	20	29	20	-31.0	22.8	41	0.284	0.204	-0.080	0.099	-28.2
Yellow-breasted Chat	25	101	84	-16.8	9.4	11	23	23	0.0	43.7	26	0.228	0.274	0.046	0.101	20.2
Summer Tanager	36	44	49	11.4	23.9	6	6	1	-83.3	20.2 **	37	0.136	0.020	-0.116	0.074	-85.0
Eastern Towhee	34	41	54	31.7	22.3	20	19	13	-31.6	28.9	38	0.463	0.241	-0.223	0.147	-48.1
Field Sparrow	12	45	41	-8.9	15.7	7	8	7	-12.5	57.7	12	0.178	0.171	-0.007	0.096	-4.0
Northern Cardinal	66	432	451	4.4	8.0	54	202	136	-32.7	13.1 *	66	0.468	0.302	-0.166	0.100 *	-35.5
Indigo Bunting	44	221	228	3.2	12.2	21	28	26	-7.1	36.6	44	0.127	0.114	-0.013	0.049	-10.0
Common Grackle	17	37	42	13.5	42.6	6	17	3	-82.4	14.5 ***	18	0.460	0.071	-0.388	0.272	-84.5
American Goldfinch	20	96	96	0.0	16.6	1	2	0	-100.0		20	0.021	0.000	-0.021	0.023	-100.0
All species pooled	**69**	**4494**	**4663**	**3.8**	**2.5**	**69**	**2008**	**1689**	**-15.9**	**5.0 *****	**69**	**0.447**	**0.362**	**-0.085**	**0.038 ****	**-18.9**
	Number increasing: 14/30 (47%)					Number decreasing: 23/30 (77%)***					Number decreasing: 23/30 (77%)***					
ALASKA AND BOREAL CANADA MAPS REGIONS																
Ruby-crowned Kinglet	6	33	16	-51.5	14.1	4	17	11	-35.3	31.2	6	0.515	0.688	0.172	0.297	33.5
Swainson's Thrush	9	44	47	6.8	20.0	8	13	13	0.0	49.3	11	0.296	0.277	-0.019	0.115	-6.4

TABLE 1. Continued.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2001	2002	%chg.	SE[b]	n[c]	2001	2002	%chg.	SE[d]	n[e]	2001	2002	change	SE[f]	%chg.
Orange-crowned Warbler	6	44	49	11.4	39.8	5	44	50	13.6	15.1	6	1.000	1.020	0.020	0.885	2.0
Yellow-rumped Warbler	11	38	42	10.5	33.5	11	22	17	-22.7	40.3	12	0.579	0.405	-0.174	0.188	-30.1
American Redstart	5	43	42	-2.3	29.8	3	10	13	30.0	139.4	5	0.233	0.310	0.077	0.196	33.1
Wilson's Warbler	7	69	58	-15.9	20.6	7	108	83	-23.1	20.7	7	1.565	1.431	-0.134	0.842	-8.6
White-crowned Sparrow	3	33	21	-36.4	12.5	3	84	51	-39.3	16.3	3	2.546	2.429	-0.117	0.887	-4.6
Dark-eyed Junco	5	22	28	27.3	50.5	7	30	45	50.0	92.0	7	1.364	1.607	0.244	1.107	17.9
All species pooled	**12**	**712**	**669**	**-6.0**	**10.8**	**12**	**506**	**500**	**-1.2**	**20.7**	**12**	**0.711**	**0.747**	**0.037**	**0.340**	**5.2**
	Number decreasing: 4/8 (50%)					Number decreasing: 4/8 (50%)					Number increasing: 4/8 (50%)					

[a] Number of stations at which at least one individual adult bird of the species was captured in either year.
[b] Standard error of the percent change in the number of adult birds captured.
[c] Number of stations at which at least one individual young bird of the species was captured in either year.
[d] Standard error of the percent change in the number of young birds captured.
[e] Number of stations at which at least one individual aged bird of the species was captured in either year.
[f] Standard error of the change in the reproductive index.
++++ Percent change undefined because no young were captured during the first year of the comparison.
* $0.05 \leq P < 0.10$; ** $0.01 \leq P < 0.05$; *** $P < 0.01$

Region, and <50% in North-central and Southeast regions; the proportions for the Southwest (76%) and Northwest (65%) regions were highly significantly and significantly >50%, respectively. Summing over these two regions, 16 species had significant increases in numbers of adults and another nine species had nearly significant increases, while only four species showed significant or nearly significant decreases. Summing over the remaining five regions, nine species had significant or nearly significant increases in numbers of adults, while five species showed significant or nearly significant decreases in numbers of adults.

Program-wide, the index for adult population size for all species pooled increased by a highly significant 8.3%. The program-wide proportion of increasing species (63%) was also highly significantly >50%. Program-wide, 13 species had significant increases in numbers of adults and another 11 species had nearly significant increases, while only eight species showed significant or nearly significant decreases.

(b) *Changes in productivity* — Overall, productivity decreased dramatically between 2001 and 2002 in five of the seven regions. The numbers of young birds of all species pooled showed a significant decrease of -11.0% in the Northwest, highly significant decreases ranging from -15.9% and -17.1% in the Southeast and Northeast, respectively, to -29.0% and -48.8% in the North-central and Southwest, respectively, and a non-significant decrease of 1.2% in Alaska/Boreal Canada. The only increase in numbers of young birds of all species pooled was a non-significant increase of 11.5% in the South-central Region. Changes in reproductive index for all species pooled generally paralleled changes in numbers of young with a highly significant -61.6% decrease in the Southwest, significant -30.1%, -20.9%, and -18.9% decreases in the North-Central, Northeast, and Southeast regions, respectively, and a nearly significant -14.7% decrease in the Northwest. Only the South-central and Alaska/Boreal Canada regions saw increases in reproductive index for all species pooled (of 8.2% and 5.2%, respectively) and these were both non-significant. Proportions of species with decreasing numbers of young ranged from 48% (South-central) to 77% (Southeast) for the seven regions and were highly significantly >50% for the Southeast and Southwest regions, significantly >50% for the North-central and Northeast regions, and nearly significantly >50% for the Northwest region. Similarly, proportions of species with decreasing reproductive indices ranged from 48% (South-central) to 89% (Southwest) for the seven regions and were highly significantly >50% for the Southeast and Southwest regions, significantly >50% for the North-central, Northeast, and Northwest regions. Summing over the seven regions, 37 species showed significant regional decreases in numbers of young and another 20 species had nearly significant decreases, while only seven species showed significant or nearly significant increases. Similarly, again summing over the seven regions, 30 species showed significant regional decreases in reproductive index and another 14 species had nearly significant decreases, while only three species showed significant or nearly significant increases.

Program-wide, the number of young for all species pooled decreased by a highly significant -19.4% while the reproductive index for all species pooled decreased by a highly significant -25.6% from 0.515 in 2001 to 0.383 in 2002. The program-wide proportions of species with decreasing numbers of young (72%) and decreasing reproductive indices (78%) were both also highly significantly >50%. Program-wide, 26 species had significant decreases in numbers of young and another 11 species had nearly significant decreases, while no species had a significant increase and only six showed nearly significant increases. Similarly, and again program-wide, 22 species had significant decreases in numbers of young and another five species had nearly significant decreases, while only two species showed significant or nearly significant increases.

2. *Changes between 2002 and 2003* — Constant-effort data on the numbers of adult and young birds captured and the proportion of young in the catch were obtained for 2002 and 2003 from 349 MAPS stations that were operated comparably in both years. The changes between 2002 and 2003 in these numbers and proportions are presented for the entire continent (program-wide) and for each region in Table 2 for those species that met the productivity selection criteria (see Methods – Data Analysis) and for all species pooled. These included 128 species

TABLE 2. Program-wide and regional changes between 2002 and 2003 in the numbers of adult and young individuals captured and in the reproductive index (young/adult) for 128 species and all species pooled (excluding gallinaceous birds and hummingbirds) at the 349 MAPS stations run comparably during both years. For each species, data were included only from stations within the breeding range of the species. Only species for which adults were captured at two or more stations and for which 50 or more aged individuals were captured in either year are included

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2002	2003	%chg.	SE[b]	n[c]	2002	2003	%chg.	SE[d]	n[e]	2002	2003	change	SE[f]	%chg.
PROGRAM-WIDE																
Common Ground-Dove	10	48	57	18.8	43.8	3	2	12	500.0	755.0	10	0.042	0.211	0.169	0.072 **	405.3
Red-bellied Woodpecker	43	43	28	-34.9	13.9 *	13	9	4	-55.6	27.8	48	0.209	0.143	-0.066	0.101	-31.7
Red-naped Sapsucker	34	53	64	20.8	13.1 *	21	16	43	168.8	63.3 ***	36	0.302	0.672	0.370	0.158 **	122.6
Red-breasted Sapsucker	51	126	137	8.7	12.6	32	73	47	-35.6	16.2 *	52	0.579	0.343	-0.236	0.110 **	-40.8
Nuttall's Woodpecker	23	42	40	-4.8	27.4	21	37	38	2.7	23.3	25	0.881	0.950	0.069	0.403	7.8
Downy Woodpecker	178	241	231	-4.1	10.0	144	253	219	-13.4	8.7	199	1.050	0.948	-0.102	0.152	-9.7
Hairy Woodpecker	118	105	80	-23.8	11.4 *	50	30	31	3.3	26.7	142	0.286	0.388	0.102	0.108	35.6
Northern Flicker	90	81	78	-3.7	16.7	52	42	37	-11.9	22.1	110	0.519	0.474	-0.044	0.147	-8.5
Western Wood-Pewee	91	249	254	2.0	10.9	41	32	47	46.9	36.8	94	0.129	0.185	0.057	0.046	44.0
Eastern Wood-Pewee	55	86	68	-20.9	11.1 *	11	8	15	87.5	111.4	57	0.093	0.221	0.128	0.158	137.1
Acadian Flycatcher	49	206	199	-3.4	10.6	16	26	9	-65.4	9.3 ***	52	0.126	0.045	-0.081	0.038 **	-64.2
"Traill's" Flycatcher	123	459	403	-12.2	8.3	37	22	48	118.2	68.0 **	123	0.048	0.119	0.071	0.026 ***	148.5
Least Flycatcher	28	82	61	-25.6	14.9	13	11	14	27.3	72.3	31	0.134	0.230	0.095	0.092	71.1
Hammond's Flycatcher	66	143	130	-9.1	16.2	27	29	42	44.8	58.1	68	0.203	0.323	0.120	0.126	59.3
Dusky Flycatcher	75	366	305	-16.7	8.4 *	28	39	48	23.1	35.9	76	0.107	0.157	0.051	0.039	47.7
"Western" Flycatcher	93	324	264	-18.5	8.9 *	62	110	103	-6.4	14.3	100	0.340	0.390	0.051	0.094	14.9
Black Phoebe	27	37	42	13.5	25.3	36	51	69	35.3	38.2	38	1.378	1.643	0.265	0.601	19.2
Eastern Phoebe	43	55	41	-25.5	19.3	35	94	33	-64.9	9.4 ***	56	1.709	0.805	-0.904	0.441 **	-52.9
Ash-throated Flycatcher	46	162	134	-17.3	12.4	13	8	24	200.0	156.1	47	0.049	0.179	0.130	0.045 ***	262.7
White-eyed Vireo	57	291	273	-6.2	8.3	42	76	82	7.9	21.8	61	0.261	0.300	0.039	0.064	15.0
Bell's Vireo	12	40	49	22.5	18.3	8	9	17	88.9	75.2	13	0.225	0.347	0.122	0.162	54.2
Cassin's Vireo	45	76	83	9.2	16.7	25	19	34	78.9	50.1 **	53	0.250	0.410	0.160	0.109	63.9
Warbling Vireo	136	615	577	-6.2	7.4	57	56	85	51.8	34.8 *	142	0.091	0.147	0.056	0.031 *	61.8
Red-eyed Vireo	114	407	377	-7.4	7.9	25	23	18	-21.7	27.5	114	0.057	0.048	-0.009	0.022	-15.5
Blue Jay	65	83	92	10.8	20.2	28	22	38	72.7	66.3	70	0.265	0.413	0.148	0.123	55.8
Tree Swallow	29	44	51	15.9	25.7	9	4	7	75.0	124.0	32	0.091	0.137	0.046	0.085	51.0
Cliff Swallow	10	47	38	-19.1	48.3	2	3	0	-100.0	0.0	11	0.064	0.000	-0.064	0.044	-100.0
Carolina Chickadee	66	154	107	-30.5	11.3 **	50	120	62	-48.3	11.0 ***	73	0.779	0.579	-0.200	0.179	-25.6
Black-capped Chickadee	116	437	450	3.0	8.3	101	317	391	23.3	15.0 *	127	0.725	0.869	0.144	0.140	19.8
Mountain Chickadee	50	161	188	16.8	14.0	40	146	109	-25.3	20.5	55	0.907	0.580	-0.327	0.230	-36.1
Chestnut-backed Chick.	53	165	144	-12.7	9.8	40	147	154	4.8	27.4	55	0.891	1.069	0.179	0.327	20.0

TABLE 2. Continued.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2002	2003	%chg.	SE[b]	n[c]	2002	2003	%chg.	SE[d]	n[e]	2002	2003	change	SE[f]	%chg.
Oak Titmouse	15	39	32	-17.9	24.2	11	39	27	-30.8	23.9	16	1.000	0.844	-0.156	0.380	-15.6
Tufted Titmouse	104	250	200	-20.0	8.1 **	87	271	163	-39.9	8.2 ***	111	1.084	0.815	-0.269	0.169	-24.8
Black-crested Titmouse	9	25	22	-12.0	33.4	7	46	25	-45.7	17.7 **	9	1.840	1.136	-0.704	0.692	-38.2
Bushtit	64	353	182	-48.4	9.9 ***	54	270	168	-37.8	15.2 *	70	0.765	0.923	0.158	0.276	20.7
Red-breasted Nuthatch	63	88	70	-20.5	13.3	44	73	97	32.9	48.2	74	0.830	1.386	0.556	0.450	67.0
White-breasted Nuthatch	60	80	58	-27.5	14.5 *	36	25	19	-24.0	25.9	79	0.313	0.328	0.015	0.124	4.8
Brown Creeper	61	72	89	23.6	17.2	68	80	101	26.3	19.9	86	1.111	1.135	0.024	0.287	2.1
Carolina Wren	84	397	285	-28.2	5.9 ***	79	357	209	-41.5	7.6 ***	93	0.899	0.733	-0.166	0.158	-18.5
Bewick's Wren	75	348	362	4.0	8.9	76	443	461	4.1	13.1	83	1.273	1.274	0.001	0.263	0.0
House Wren	94	463	488	5.4	7.7	93	366	370	1.1	11.7	109	0.791	0.758	-0.032	0.155	-4.1
Winter Wren	32	66	84	27.3	16.4	31	27	73	170.4	80.2 ***	43	0.409	0.869	0.460	0.248 *	112.4
Marsh Wren	8	8	5	-37.5	43.8	10	15	45	200.0	71.7 **	13	1.875	9.000	7.125	2.402 **	380.0
Golden-crowned Kinglet	49	124	113	-8.9	15.5	36	198	279	40.9	47.2	59	1.597	2.469	0.872	1.086	54.6
Ruby-crowned Kinglet	32	87	157	80.5	40.3 **	20	43	63	46.5	32.6	34	0.494	0.401	-0.093	0.239	-18.8
Blue-gray Gnatcatcher	39	60	52	-13.3	17.3	24	17	44	158.8	84.7 **	49	0.283	0.846	0.563	0.310 *	198.6
Eastern Bluebird	25	39	24	-38.5	16.5 *	15	41	17	-58.5	19.7	29	1.051	0.708	-0.343	0.445	-32.6
Veery	54	304	260	-14.5	7.1 *	32	38	47	23.7	36.6	54	0.125	0.181	0.056	0.048	44.6
Swainson's Thrush	116	1353	1185	-12.4	5.3 **	73	175	210	20.0	16.3	118	0.129	0.177	0.048	0.030	37.0
Hermit Thrush	69	152	123	-19.1	9.0 *	47	54	47	-13.0	21.9	81	0.355	0.382	0.027	0.092	7.6
Wood Thrush	84	506	391	-22.7	5.7 ***	60	110	121	10.0	16.6	86	0.217	0.310	0.092	0.048 *	42.4
American Robin	221	949	963	1.5	6.3	139	337	398	18.1	15.3	231	0.355	0.413	0.058	0.064	16.4
Wrentit	41	460	293	-36.3	8.2 **	40	174	406	133.3	65.4 ***	43	0.378	1.386	1.007	0.271 ***	266.3
Gray Catbird	116	1614	1505	-6.8	4.5	80	591	752	27.2	14.9 **	120	0.366	0.500	0.134	0.078 *	36.5
Brown Thrasher	43	68	63	-7.4	18.7	29	28	26	-7.1	30.5	51	0.412	0.413	0.001	0.146	0.2
Cedar Waxwing	86	478	417	-12.8	9.7	14	11	31	181.8	160.1	87	0.023	0.074	0.051	0.025 **	223.0
Blue-winged Warbler	24	79	56	-29.1	13.9 **	11	12	11	-8.3	36.8	24	0.152	0.196	0.045	0.071	29.3
Tennessee Warbler	14	29	57	96.6	116.8	6	26	51	96.2	16.3 *	14	0.897	0.895	-0.002	1.132	-0.2
Orange-crowned Warbler	68	272	242	-11.0	15.0	51	144	199	38.2	43.9	74	0.529	0.822	0.293	0.276	55.3
Nashville Warbler	38	112	109	-2.7	18.7	26	121	47	-61.2	13.7 **	42	1.080	0.431	-0.649	0.379 *	-60.1
Virginia's Warbler	12	71	81	14.1	25.6	8	38	38	0.0	25.8	13	0.535	0.469	-0.066	0.229	-12.3
Lucy's Warbler	13	115	103	-10.4	19.5	10	23	46	100.0	106.9	13	0.200	0.447	0.247	0.153	123.3
Northern Parula	23	22	43	95.5	63.3 *	13	10	15	50.0	85.2	28	0.455	0.349	-0.106	0.276	-23.3
Yellow Warbler	150	1549	1429	-7.7	5.0	97	430	599	39.3	17.8 **	155	0.278	0.419	0.142	0.052 ***	51.0
Chestnut-sided Warbler	22	72	73	1.4	17.6	7	25	15	-40.0	16.3 **	22	0.347	0.206	-0.142	0.167	-40.8
Magnolia Warbler	16	45	47	4.4	30.3	8	18	10	-44.4	32.1	16	0.400	0.213	-0.187	0.163	-46.8

TABLE 2. Continued.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2002	2003	%chg.	SE[b]	n[c]	2002	2003	%chg.	SE[d]	n[e]	2002	2003	change	SE[f]	%chg.
Yellow-rumped Warbler	95	522	428	-18.0	7.3 **	54	473	271	-42.7	30.8	96	0.906	0.633	-0.273	0.467	-30.1
Black-thrtd Green Warb.	19	42	27	-35.7	14.6 *	9	12	10	-16.7	31.7	23	0.286	0.370	0.085	0.281	29.6
Townsend's Warbler	23	111	88	-20.7	12.8	13	65	130	100.0	79.2	23	0.586	1.477	0.892	0.658	152.3
Hermit Warbler	35	140	135	-3.6	19.0	24	128	36	-71.9	13.9 ***	37	0.914	0.267	-0.648	0.314 **	-70.8
Prairie Warbler	17	70	56	-20.0	14.1	13	21	28	33.3	32.3	20	0.300	0.500	0.200	0.151	66.7
Black-and-white Warbler	68	127	134	5.5	14.7	40	51	59	15.7	30.1	78	0.402	0.440	0.039	0.120	9.6
American Redstart	73	376	348	-7.4	11.9	34	91	92	1.1	18.8	78	0.242	0.264	0.022	0.072	9.2
Prothonotary Warbler	18	107	110	2.8	18.4	9	23	24	4.3	76.8	18	0.215	0.218	0.003	0.137	1.5
Worm-eating Warbler	50	111	124	11.7	16.3	26	63	56	-11.1	19.3	53	0.568	0.452	-0.116	0.237	-20.4
Ovenbird	102	405	341	-15.8	7.2 **	65	135	151	11.9	18.7	108	0.333	0.443	0.110	0.082	32.8
Northern Waterthrush	21	36	39	8.3	27.0	14	10	14	40.0	63.7	28	0.278	0.359	0.081	0.199	29.2
Louisiana Waterthrush	43	80	83	3.8	14.4	27	49	45	-8.2	18.8	46	0.612	0.542	-0.070	0.192	-11.5
Kentucky Warbler	32	145	150	3.4	13.8	22	54	39	-27.8	21.0	34	0.372	0.260	-0.112	0.100	-30.2
MacGillivray's Warbler	117	965	797	-17.4	4.8 ***	82	248	347	39.9	14.9 ***	124	0.257	0.435	0.178	0.055 ***	69.4
Common Yellowthroat	174	1370	1173	-14.4	4.3 ***	103	415	593	42.9	25.1 *	179	0.303	0.506	0.203	0.107 *	66.9
Hooded Warbler	40	167	154	-7.8	10.5	24	45	44	-2.2	18.9	42	0.270	0.286	0.016	0.118	6.0
Wilson's Warbler	102	854	687	-19.6	8.5 **	57	223	312	39.9	19.3 **	105	0.261	0.454	0.193	0.110 *	73.9
Canada Warbler	15	33	42	27.3	33.6	13	12	20	66.7	43.8 *	20	0.364	0.476	0.113	0.190	31.0
Yellow-breasted Chat	71	480	386	-19.6	6.7 **	37	95	72	-24.2	15.0	73	0.198	0.187	-0.011	0.062	-5.8
Summer Tanager	48	128	137	7.0	15.9	15	8	14	75.0	82.0	49	0.063	0.102	0.040	0.041	63.5
Scarlet Tanager	45	57	57	0.0	19.1	10	13	11	-15.4	60.3	49	0.228	0.193	-0.035	0.171	-15.4
Western Tanager	106	347	276	-20.5	8.4 **	47	115	162	40.9	49.9	111	0.331	0.587	0.256	0.186	77.1
Green-tailed Towhee	26	69	60	-13.0	15.6	19	47	32	-31.9	23.4	31	0.681	0.533	-0.148	0.271	-21.7
Spotted Towhee	83	510	451	-11.6	7.1	72	285	301	5.6	23.6	90	0.559	0.667	0.109	0.153	19.4
Eastern Towhee	66	123	118	-4.1	12.5	35	40	36	-10.0	23.2	71	0.325	0.305	-0.020	0.094	-6.2
California Towhee	26	122	65	-46.7	12.6 **	18	7	67	857.1	518.8	28	0.057	1.031	0.973	0.236 ***	1696.5
Rufous-crowned Sparrow	15	38	25	-34.2	19.6	10	14	28	100.0	127.8	16	0.368	1.120	0.752	0.575	204.0
Chipping Sparrow	97	239	225	-5.9	10.5	51	70	111	58.6	31.7 **	105	0.293	0.493	0.200	0.116 *	68.4
Clay-colored Sparrow	4	66	58	-12.1	3.1 *	3	15	41	173.3	50.7 *	5	0.227	0.707	0.480	0.283	211.0
Brewer's Sparrow	21	61	45	-26.2	22.0	19	46	33	-28.3	26.8	26	0.754	0.733	-0.021	0.300	-2.8
Field Sparrow	41	169	139	-17.8	11.4	25	39	50	28.2	29.0	42	0.231	0.360	0.129	0.134	55.9
Savannah Sparrow	13	98	60	-38.8	5.7 ***	7	12	11	-8.3	60.6	14	0.122	0.183	0.061	0.151	49.7
Grasshopper Sparrow	6	48	43	-10.4	33.3	5	78	37	-52.6	22.3	7	1.625	0.860	-0.765	0.647	-47.0
Fox Sparrow	38	105	83	-21.0	12.0	15	15	17	13.3	59.3	41	0.143	0.205	0.062	0.089	43.4
Song Sparrow	191	1867	1672	-10.4	3.9 **	191	1319	1573	19.3	9.6 **	206	0.707	0.941	0.234	0.088 ***	33.2

TABLE 2. Continued.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2002	2003	%chg.	SE[b]	n[c]	2002	2003	%chg.	SE[d]	n[e]	2002	2003	change	SE[f]	%chg.
Lincoln's Sparrow	51	268	236	-11.9	7.8	41	109	104	-4.6	23.7	56	0.407	0.441	0.034	0.118	8.3
Swamp Sparrow	16	60	42	-30.0	13.8	9	39	50	28.2	36.5	19	0.650	1.191	0.541	0.364	83.1
White-throated Sparrow	15	55	70	27.3	26.0	10	16	18	12.5	52.5	15	0.291	0.257	-0.034	0.143	-11.6
White-crowned Sparrow	21	80	75	-6.3	12.1	15	35	53	51.4	51.5	24	0.438	0.707	0.269	0.217	61.5
Dark-eyed Junco	96	819	590	-28.0	3.7 ***	93	560	547	-2.3	15.4	108	0.684	0.927	0.243	0.168	35.6
Northern Cardinal	129	882	797	-9.6	6.1	97	367	326	-11.2	11.2	130	0.416	0.409	-0.007	0.065	-1.7
Rose-breasted Grosbeak	31	79	69	-12.7	15.4	13	15	14	-6.7	34.2	34	0.190	0.203	0.013	0.113	6.9
Black-headed Grosbeak	122	495	455	-8.1	8.4	75	117	169	44.4	31.4	129	0.236	0.371	0.135	0.102	57.1
Blue Grosbeak	31	94	111	18.1	22.0	6	3	11	266.7	247.7	31	0.032	0.099	0.067	0.036 *	210.5
Lazuli Bunting	83	237	225	-5.1	11.9	30	53	59	11.3	31.0	85	0.224	0.262	0.039	0.086	17.3
Indigo Bunting	84	418	387	-7.4	9.4	32	49	29	-40.8	19.1	86	0.117	0.075	-0.042	0.033	-36.1
Painted Bunting	20	150	154	2.7	9.3	16	74	37	-50.0	9.2 ***	21	0.493	0.240	-0.253	0.091 ***	-51.3
Dickcissel	6	81	66	-18.5	42.2	3	0	5	++++		6	0.000	0.076	0.076	0.027 **	++++
Red-winged Blackbird	70	284	316	11.3	12.0	22	28	32	14.3	68.1	72	0.099	0.101	0.003	0.051	2.7
Common Grackle	50	93	93	0.0	22.2	14	13	17	30.8	66.8	51	0.140	0.183	0.043	0.083	30.8
Brown-headed Cowbird	155	287	284	-1.0	9.9	52	23	52	126.1	61.7 ***	166	0.080	0.183	0.103	0.042 **	128.5
Orchard Oriole	15	41	51	24.4	23.7	6	6	5	-16.7	91.4	16	0.146	0.098	-0.048	0.101	-33.0
Bullock's Oriole	60	183	176	-3.8	12.9	27	51	54	5.9	42.8	64	0.279	0.307	0.028	0.115	10.1
Baltimore Oriole	41	74	64	-13.5	20.1	19	34	28	-17.6	64.0	44	0.460	0.438	-0.022	0.338	-4.8
Purple Finch	49	221	237	7.2	13.2	33	100	54	-46.0	9.6 ***	54	0.453	0.228	-0.225	0.077 ***	-49.6
Cassin's Finch	34	47	80	70.2	53.3	13	11	17	54.5	61.2	34	0.234	0.213	-0.022	0.116	-9.2
House Finch	61	259	194	-25.1	11.0 *	45	245	178	-27.3	15.9	70	0.946	0.918	-0.028	0.285	-3.0
Pine Siskin	48	132	172	30.3	25.5	23	93	167	79.6	88.2	50	0.705	0.971	0.266	0.477	37.8
Lesser Goldfinch	42	187	156	-16.6	19.9	28	47	85	80.9	43.2 **	46	0.251	0.545	0.294	0.199	116.8
American Goldfinch	132	964	755	-21.7	5.2 ***	18	17	24	41.2	53.9	133	0.018	0.032	0.014	0.013	80.3
Evening Grosbeak	14	89	136	52.8	22.1	5	4	7	75.0	125.0	14	0.045	0.052	0.007	0.027	14.5
House Sparrow	13	18	35	94.4	46.9 *	4	29	16	-44.8	19.6	14	1.611	0.457	-1.154	0.488 **	-71.6
All species pooled	**349**	**34130**	**30624**	**-10.3**	**1.6 *** **	**348**	**13331**	**14547**	**9.1**	**5.4 ***	**349**	**0.391**	**0.475**	**0.084**	**0.028 *** **	**21.6**
	Number decreasing:86/128 (67%)***					Number increasing: 78/128 (61%)***					Number increasing: 84/128 (66%)***					
NORTHWEST MAPS REGION																
Red-naped Sapsucker	34	53	64	20.8	13.1 *	21	16	43	168.8	63.3 ***	36	0.302	0.672	0.370	0.158 **	122.6
Red-breasted Sapsucker	51	126	137	8.7	12.6	32	73	47	-35.6	16.2 *	52	0.579	0.343	-0.236	0.110 **	-40.8
Downy Woodpecker	52	53	67	26.4	23.4	33	38	38	0.0	24.8	56	0.717	0.567	-0.150	0.206	-20.9
Hairy Woodpecker	52	40	32	-20.0	17.9	25	18	11	-38.9	23.2	63	0.450	0.344	-0.106	0.176	-23.6

TABLE 2. Continued.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2002	2003	%chg.	SE[b]	n[c]	2002	2003	%chg.	SE[d]	n[e]	2002	2003	change	SE[f]	%chg.
Northern Flicker	36	31	40	29.0	36.9	27	19	22	15.8	37.6	49	0.613	0.550	-0.063	0.265	-10.3
Western Wood-Pewee	65	184	201	9.2	14.2	35	28	43	53.6	42.0	67	0.152	0.214	0.062	0.056	40.6
"Traill's" Flycatcher	69	252	239	-5.2	10.7	21	15	27	80.0	78.7	69	0.060	0.113	0.053	0.037	89.8
Hammond's Flycatcher	63	125	130	4.0	15.0	27	29	42	44.8	58.1	65	0.232	0.323	0.091	0.130	39.3
Dusky Flycatcher	67	306	280	-8.5	7.8	25	33	46	39.4	43.7	68	0.108	0.164	0.056	0.043	52.3
"Western" Flycatcher	59	156	160	2.6	13.2	43	63	55	-12.7	18.0	65	0.404	0.344	-0.060	0.108	-14.9
Cassin's Vireo	44	74	83	12.2	17.0	25	19	34	78.9	50.1 **	52	0.257	0.410	0.153	0.110	59.5
Warbling Vireo	96	498	472	-5.2	8.2	37	38	52	36.8	38.1	97	0.076	0.110	0.034	0.028	44.4
Black-capped Chickadee	43	173	162	-6.4	10.6	43	130	193	48.5	27.1 **	48	0.751	1.191	0.440	0.236 *	58.5
Mountain Chickadee	48	160	187	16.9	14.1	38	142	109	-23.2	21.4	53	0.888	0.583	-0.305	0.230	-34.3
Chestnut-backed Chick.	44	129	119	-7.8	11.7	31	73	93	27.4	39.6	46	0.566	0.781	0.216	0.245	38.1
Bushtit	26	62	61	-1.6	31.4	21	102	46	-54.9	25.7	30	1.645	0.754	-0.891	0.365 **	-54.2
Red-breasted Nuthatch	58	85	66	-22.4	13.4	42	72	94	30.6	48.3	68	0.847	1.424	0.577	0.471	68.1
Brown Creeper	51	63	82	30.2	19.1 *	60	77	96	24.7	20.1	71	1.222	1.171	-0.052	0.319	-4.2
Bewick's Wren	20	65	49	-24.6	14.7	21	95	86	-9.5	17.2	25	1.462	1.755	0.294	0.665	20.1
House Wren	27	154	143	-7.1	10.8	33	128	141	10.2	19.3	36	0.831	0.986	0.155	0.248	18.6
Winter Wren	26	62	80	29.0	16.6 *	26	27	68	151.9	76.6 ***	34	0.436	0.850	0.415	0.258	95.2
Golden-crowned Kinglet	42	110	105	-4.5	17.0	34	196	279	42.3	47.7	51	1.782	2.657	0.875	1.156	49.1
Ruby-crowned Kinglet	28	84	155	84.5	42.0 **	18	43	60	39.5	30.2 *	29	0.512	0.387	-0.125	0.244	-24.4
Swainson's Thrush	83	1019	941	-7.7	5.3	56	116	143	23.3	23.6	84	0.114	0.152	0.038	0.032	33.5
Hermit Thrush	37	63	62	-1.6	16.3	26	22	28	27.3	37.9	44	0.349	0.452	0.102	0.137	29.3
American Robin	114	516	537	4.1	7.1	66	130	176	35.4	27.0	118	0.252	0.328	0.076	0.069	30.1
Wrentit	17	54	65	20.4	20.9	17	58	61	5.2	24.3	19	1.074	0.939	-0.136	0.260	-12.6
Gray Catbird	17	166	224	34.9	20.7	13	49	87	77.6	45.5	17	0.295	0.388	0.093	0.135	31.6
Cedar Waxwing	38	243	200	-17.7	11.0	10	8	24	200.0	200.7	39	0.033	0.120	0.087	0.039 **	264.5
Orange-crowned Warbler	45	156	153	-1.9	20.1	30	94	92	-2.1	20.4	50	0.603	0.601	-0.001	0.262	-0.2
Nashville Warbler	26	89	74	-16.9	12.2	21	90	24	-73.3	8.0 ***	29	1.011	0.324	-0.687	0.367 *	-67.9
Virginia's Warbler	5	41	57	39.0	46.2	4	23	31	34.8	28.8	6	0.561	0.544	-0.017	0.332	-3.1
Yellow Warbler	71	957	943	-1.5	7.6	53	306	404	32.0	18.2 *	73	0.320	0.428	0.109	0.066 *	34.0
Yellow-rumped Warbler	75	483	394	-18.4	7.6 **	47	465	191	-58.9	20.4 ***	76	0.963	0.485	-0.478	0.480	-49.6
Townsend's Warbler	22	110	88	-20.0	12.9	13	65	130	100.0	79.2	22	0.591	1.477	0.886	0.659	150.0
Hermit Warbler	35	140	135	-3.6	19.0	24	128	36	-71.9	13.9 ***	37	0.914	0.267	-0.648	0.314 **	-70.8
American Redstart	12	79	64	-19.0	16.7	9	12	19	58.3	112.1	13	0.152	0.297	0.145	0.133	95.4
MacGillivray's Warbler	99	900	767	-14.8	4.7 ***	79	246	342	39.0	14.8 ***	104	0.273	0.446	0.173	0.057 ***	63.1
Common Yellowthroat	39	265	233	-12.1	10.6	21	137	200	46.0	55.2	40	0.517	0.858	0.341	0.449	66.0

TABLE 2. Continued.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2002	2003	%chg.	SE[b]	n[c]	2002	2003	%chg.	SE[d]	n[e]	2002	2003	change	SE[f]	%chg.
Wilson's Warbler	85	637	541	-15.1	10.4	47	99	147	48.5	36.0	88	0.155	0.272	0.116	0.071	74.8
Yellow-breasted Chat	21	99	111	12.1	13.3	12	43	26	-39.5	23.6	22	0.434	0.234	-0.200	0.188	-46.1
Western Tanager	90	296	245	-17.2	8.8 *	44	110	118	7.3	33.7	94	0.372	0.482	0.110	0.144	29.6
Green-tailed Towhee	22	62	59	-4.8	17.1	18	45	27	-40.0	21.1	27	0.726	0.458	-0.268	0.280	-36.9
Spotted Towhee	42	204	198	-2.9	9.4	41	132	146	10.6	16.1	49	0.647	0.737	0.090	0.196	14.0
Chipping Sparrow	51	153	149	-2.6	14.2	28	53	84	58.5	37.8 *	55	0.346	0.564	0.217	0.157	62.7
Brewer's Sparrow	17	55	43	-21.8	24.2	17	46	31	-32.6	25.9	22	0.836	0.721	-0.115	0.319	-13.8
Savannah Sparrow	10	94	57	-39.4	5.6 ***	6	11	11	0.0	69.0	10	0.117	0.193	0.076	0.165	64.9
Fox Sparrow	37	105	82	-21.9	11.9	15	15	17	13.3	59.3	40	0.143	0.207	0.064	0.090	45.1
Song Sparrow	98	953	942	-1.2	5.0	99	726	881	21.4	12.9 *	106	0.762	0.935	0.173	0.126	22.8
Lincoln's Sparrow	45	264	229	-13.3	7.7	38	109	99	-9.2	23.0	49	0.413	0.432	0.019	0.120	4.7
White-crowned Sparrow	18	76	74	-2.6	12.7	12	33	51	54.5	55.7	19	0.434	0.689	0.255	0.224	58.7
Dark-eyed Junco	79	766	553	-27.8	3.9 ***	76	491	425	-13.4	13.0	85	0.641	0.769	0.128	0.137	19.9
Black-headed Grosbeak	83	276	279	1.1	12.0	51	82	108	31.7	31.2	89	0.297	0.387	0.090	0.153	30.3
Lazuli Bunting	60	197	183	-7.1	12.7	24	53	41	-22.6	17.7	62	0.269	0.224	-0.045	0.093	-16.7
Red-winged Blackbird	24	124	129	4.0	15.9	9	13	11	-15.4	71.4	26	0.105	0.085	-0.020	0.078	-18.7
Brown-headed Cowbird	60	113	133	17.7	16.4	22	7	30	328.6	178.5 ***	63	0.062	0.226	0.164	0.074 **	264.1
Bullock's Oriole	29	120	96	-20.0	13.6	15	43	34	-20.9	37.6	32	0.358	0.354	-0.004	0.173	-1.2
Purple Finch	33	176	208	18.2	13.8	23	79	44	-44.3	11.0 **	36	0.449	0.212	-0.237	0.080 ***	-52.9
Cassin's Finch	34	47	80	70.2	53.3	13	11	17	54.5	61.2	34	0.234	0.213	-0.022	0.116	-9.2
House Finch	17	77	44	-42.9	12.9 ***	16	91	47	-48.4	15.6 ***	21	1.182	1.068	-0.114	0.272	-9.6
Pine Siskin	47	131	171	30.5	25.7	22	93	166	78.5	88.0	49	0.710	0.971	0.261	0.480	36.7
Lesser Goldfinch	17	50	86	72.0	37.7 *	12	31	54	74.2	34.5 *	18	0.620	0.628	0.008	0.415	1.3
American Goldfinch	30	183	221	20.8	12.5 *	9	11	16	45.5	73.2	30	0.060	0.072	0.012	0.046	20.4
Evening Grosbeak	14	89	136	52.8	22.1	5	4	7	75.0	125.0	14	0.045	0.052	0.007	0.027	14.5
All species pooled	**126**	**14161**	**13597**	**-4.0**	**2.2 ***	**126**	**6076**	**6547**	**7.8**	**8.9**	**126**	**0.429**	**0.482**	**0.052**	**0.048**	**12.2**
	Number decreasing: 38/64 (59%)*					Number increasing: 42/64 (66%)***					Number increasing: 40/64 (63%)**					
SOUTHWEST MAPS REGION																
Nuttall's Woodpecker	23	42	40	-4.8	27.4	21	37	38	2.7	23.3	25	0.881	0.950	0.069	0.403	7.8
Downy Woodpecker	23	33	30	-9.1	25.0	19	38	32	-15.8	28.5	23	1.152	1.067	-0.085	0.481	-7.4
Western Wood-Pewee	24	60	47	-21.7	17.1	5	4	3	-25.0	57.6	25	0.067	0.064	-0.003	0.059	-4.3
Dusky Flycatcher	8	60	25	-58.3	24.0 *	3	6	2	-66.7	25.5	8	0.100	0.080	-0.020	0.079	-20.0
"Western" Flycatcher	34	168	104	-38.1	11.1 **	19	47	48	2.1	23.4	35	0.280	0.462	0.182	0.173	65.0
Black Phoebe	19	31	30	-3.2	22.0	28	29	52	79.3	58.1 **	29	0.936	1.733	0.798	0.555	85.3

TABLE 2. Continued.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2002	2003	%chg.	SE[b]	n[c]	2002	2003	%chg.	SE[d]	n[e]	2002	2003	change	SE[f]	%chg.
Ash-throated Flycatcher	39	151	121	-19.9	12.9	11	8	20	150.0	127.8	40	0.053	0.165	0.112	0.045 **	212.0
Warbling Vireo	26	102	88	-13.7	19.0	12	15	25	66.7	75.9	29	0.147	0.284	0.137	0.134	93.2
Chestnut-backed Chick.	9	36	25	-30.6	18.9	9	74	61	-17.6	33.2	9	2.056	2.440	0.384	1.396	18.7
Oak Titmouse	15	39	32	-17.9	24.2	11	39	27	-30.8	23.9	16	1.000	0.844	-0.156	0.380	-15.6
Bushtit	37	291	118	-59.5	7.8 ***	33	168	122	-27.4	19.0	39	0.577	1.034	0.457	0.319	79.1
Bewick's Wren	47	254	277	9.1	11.1	47	299	319	6.7	18.7	49	1.177	1.152	-0.026	0.306	-2.2
House Wren	29	164	188	14.6	13.5	26	154	129	-16.2	14.4	31	0.939	0.686	-0.253	0.267	-26.9
Swainson's Thrush	18	286	207	-27.6	13.7 *	11	50	54	8.0	17.3	18	0.175	0.261	0.086	0.074	49.2
American Robin	22	69	67	-2.9	17.3	11	5	26	420.0	365.9	24	0.073	0.388	0.316	0.142 **	435.5
Wrentit	24	406	228	-43.8	7.5 ***	23	116	345	197.4	105.8 ***	24	0.286	1.513	1.227	0.338 ***	429.6
Orange-crowned Warbler	22	112	85	-24.1	21.4	20	50	106	112.0	129.7	23	0.446	1.247	0.801	0.590	179.3
Lucy's Warbler	13	115	103	-10.4	19.5	10	23	46	100.0	106.9	13	0.200	0.447	0.247	0.153	123.3
Yellow Warbler	32	162	122	-24.7	8.3 **	12	13	36	176.9	100.4	32	0.080	0.295	0.215	0.098 **	267.7
MacGillivray's Warbler	18	65	30	-53.8	17.4 ***	3	2	5	150.0	377.5	20	0.031	0.167	0.136	0.111	441.7
Common Yellowthroat	36	466	311	-33.3	5.5 ***	22	91	149	63.7	50.3	36	0.195	0.479	0.284	0.127 **	145.3
Wilson's Warbler	15	217	140	-35.5	12.0 **	10	124	165	33.1	21.2	15	0.571	1.179	0.607	0.309 *	106.3
Yellow-breasted Chat	23	240	155	-35.4	8.6 **	11	18	19	5.6	40.1	23	0.075	0.123	0.048	0.059	63.4
Summer Tanager	9	68	68	0.0	21.5	5	1	7	600.0	758.3	9	0.015	0.103	0.088	0.045 *	600.0
Western Tanager	15	50	31	-38.0	26.8	2	4	44	1000.0	50.0	15	0.080	1.419	1.339	0.942	1674.2
Spotted Towhee	40	305	251	-17.7	10.0 *	31	153	155	1.3	40.7	40	0.502	0.617	0.116	0.222	23.1
California Towhee	25	121	65	-46.3	12.8 **	18	7	67	857.1	518.8	27	0.058	1.031	0.973	0.236 ***	1681.8
Song Sparrow	41	556	417	-25.0	5.9 ***	39	414	442	6.8	18.1	42	0.745	1.060	0.315	0.176 *	42.4
Black-headed Grosbeak	38	212	166	-21.7	11.8 *	23	34	50	47.1	71.5	39	0.160	0.301	0.141	0.112	87.8
Blue Grosbeak	22	88	104	18.2	23.3	6	3	11	266.7	247.7	22	0.034	0.106	0.072	0.039 *	210.3
Lazuli Bunting	22	40	41	2.5	32.5	6	0	18	++++		22	0.000	0.439	0.439	0.209 **	++++
Brown-headed Cowbird	32	85	51	-40.0	11.9 **	6	4	3	-25.0	69.1	33	0.047	0.059	0.012	0.047	25.0
Bullock's Oriole	27	50	65	30.0	24.1	9	3	10	233.3	258.2	28	0.060	0.154	0.094	0.069	156.4
Purple Finch	10	35	24	-31.4	20.7	6	17	8	-52.9	24.5 *	10	0.486	0.333	-0.152	0.284	-31.4
House Finch	32	164	142	-13.4	15.0	22	147	124	-15.6	23.6	34	0.896	0.873	-0.023	0.393	-2.6
Lesser Goldfinch	25	137	70	-48.9	14.5 **	16	16	31	93.8	114.4	28	0.117	0.443	0.326	0.135 **	279.2
American Goldfinch	19	130	76	-41.5	8.7 ***	5	4	6	50.0	123.4	19	0.031	0.079	0.048	0.044	156.6
All species pooled	**52**	**6402**	**4740**	**-26.0**	**4.2 *****	**52**	**2391**	**3130**	**30.9**	**18.9 ** **	**52**	**0.374**	**0.660**	**0.287**	**0.086 *****	**76.8**
	Number decreasing: 31/37 (84%)***					Number increasing: 27/37 (73%)***					Number increasing: 29/37 (78%)***					

TABLE 2. Continued.

Species	ADULTS n[a]	2002	2003	%chg.	SE[b]	YOUNG n[c]	2002	2003	%chg.	SE[d]	REPRODUCTIVE INDEX n[e]	2002	2003	change	SE[f]	%chg.
NORTH-CENTRAL MAPS REGION																
Downy Woodpecker	16	22	31	40.9	32.5	15	31	33	6.5	23.1	19	1.409	1.065	-0.345	0.491	-24.5
"Traill's" Flycatcher	14	86	64	-25.6	24.1	4	4	9	125.0	179.1	14	0.047	0.141	0.094	0.070	202.3
Red-eyed Vireo	11	55	52	-5.5	21.2	3	2	2	0.0	150.0	11	0.036	0.039	0.002	0.042	5.8
Black-capped Chickadee	19	75	96	28.0	23.0	15	62	78	25.8	41.8	20	0.827	0.813	-0.014	0.336	-1.7
House Wren	14	89	102	14.6	16.3	13	45	69	53.3	44.7	15	0.506	0.677	0.171	0.331	33.8
American Robin	20	96	69	-28.1	18.0	14	47	52	10.6	21.3	20	0.490	0.754	0.264	0.248	53.9
Gray Catbird	18	353	302	-14.4	6.5 **	17	114	151	32.5	24.5	18	0.323	0.500	0.177	0.142	54.8
Cedar Waxwing	16	68	54	-20.6	27.2	2	1	2	100.0	400.0	16	0.015	0.037	0.022	0.044	151.9
Tennessee Warbler	5	11	49	345.5	157.5 *	3	1	5	400.0	458.3	5	0.091	0.102	0.011	0.081	12.2
Yellow Warbler	14	209	185	-11.5	7.6	13	35	83	137.1	82.0 *	15	0.168	0.449	0.281	0.106 **	167.9
American Redstart	12	69	68	-1.4	24.1	3	5	3	-40.0	36.0	12	0.073	0.044	-0.028	0.041	-39.1
Ovenbird	13	41	47	14.6	22.5	5	19	7	-63.2	17.8 **	13	0.463	0.149	-0.315	0.214	-67.9
Common Yellowthroat	19	223	216	-3.1	7.7	15	97	120	23.7	55.2	20	0.435	0.556	0.121	0.209	27.7
Clay-colored Sparrow	2	64	58	-9.4	0.8	3	15	41	173.3	50.7 *	3	0.234	0.707	0.473	0.312	201.6
Field Sparrow	12	61	54	-11.5	25.0	7	11	13	18.2	68.0	12	0.180	0.241	0.060	0.128	33.5
Grasshopper Sparrow	3	36	22	-38.9	24.1	2	52	10	-80.8	6.4	3	1.444	0.455	-0.990	0.816	-68.5
Song Sparrow	18	119	143	20.2	15.7	19	54	92	70.4	36.8 *	20	0.454	0.643	0.190	0.206	41.8
Northern Cardinal	14	56	65	16.1	19.9	9	17	14	-17.6	37.2	14	0.304	0.215	-0.088	0.121	-29.1
Indigo Bunting	14	59	61	3.4	17.8	3	1	3	200.0	458.3	14	0.017	0.049	0.032	0.042	190.2
Dickcissel	3	63	21	-66.7	6.0 ***	1	0	1	++++		3	0.000	0.048	0.048	0.065	++++
Red-winged Blackbird	12	86	79	-8.1	14.0	6	10	5	-50.0	49.0	12	0.116	0.063	-0.053	0.060	-45.6
Baltimore Oriole	14	39	32	-17.9	23.3	8	13	23	76.9	199.0	14	0.333	0.719	0.385	0.712	115.6
American Goldfinch	19	241	159	-34.0	9.6 **	0	0	0			19	0.000	0.000	0.000		
All species pooled	**24**	**2809**	**2611**	**-7.0**	**4.5**	**23**	**819**	**975**	**19.0**	**18.1**	**24**	**0.292**	**0.373**	**0.082**	**0.063**	**28.1**
	Number decreasing: 15/23 (65%)					Number increasing: 16/23 (70%)**					Number increasing: 16/23 (70%)**					
SOUTH-CENTRAL MAPS REGION																
Common Ground-Dove	6	31	47	51.6	45.5	2	1	12	1100.0	2000.0	6	0.032	0.255	0.223	0.063 **	691.5
Downy Woodpecker	11	25	18	-28.0	31.1	11	27	24	-11.1	20.3	12	1.080	1.333	0.253	0.571	23.5
Acadian Flycatcher	11	68	68	0.0	22.9	4	15	6	-60.0	9.5 **	12	0.221	0.088	-0.132	0.061 *	-60.0
White-eyed Vireo	22	176	174	-1.1	11.9	18	40	56	40.0	37.5	22	0.227	0.322	0.095	0.081	41.6
Carolina Chickadee	23	55	61	10.9	25.6	21	50	22	-56.0	16.4 ***	25	0.909	0.361	-0.548	0.292 *	-60.3
Tufted Titmouse	18	67	54	-19.4	17.9	17	64	53	-17.2	17.5	19	0.955	0.981	0.026	0.328	2.7
Black-crested Titmouse	9	25	22	-12.0	33.4	7	46	25	-45.7	17.7 **	9	1.840	1.136	-0.704	0.692	-38.2

TABLE 2. Continued.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2002	2003	%chg.	SE[b]	n[c]	2002	2003	%chg.	SE[d]	n[e]	2002	2003	change	SE[f]	%chg.
Carolina Wren	21	104	115	10.6	16.2	19	116	80	-31.0	14.8	21	1.115	0.696	-0.420	0.311	-37.6
Bewick's Wren	8	29	36	24.1	18.0	8	49	56	14.3	22.5	9	1.690	1.556	-0.134	1.100	-7.9
Prothonotary Warbler	8	70	79	12.9	28.0	8	9	23	155.6	118.9	8	0.129	0.291	0.163	0.132	126.4
Kentucky Warbler	12	74	88	18.9	21.3	13	35	28	-20.0	28.0	14	0.473	0.318	-0.155	0.154	-32.7
Hooded Warbler	4	31	28	-9.7	14.4	4	19	15	-21.1	7.8	4	0.613	0.536	-0.077	0.258	-12.6
Yellow-breasted Chat	7	70	56	-20.0	13.9	6	17	13	-23.5	30.2	8	0.243	0.232	-0.011	0.104	-4.4
Field Sparrow	10	42	44	4.8	20.9	6	19	23	21.1	31.7	10	0.452	0.523	0.070	0.352	15.6
Northern Cardinal	29	330	281	-14.8	11.6	27	202	149	-26.2	14.5	29	0.612	0.530	-0.082	0.137	-13.4
Indigo Bunting	13	166	154	-7.2	14.8	7	16	5	-68.8	21.2	13	0.096	0.033	-0.064	0.044	-66.3
Painted Bunting	19	138	148	7.2	9.0	15	70	37	-47.1	9.5 ***	20	0.507	0.250	-0.257	0.096 **	-50.7
Brown-headed Cowbird	20	44	31	-29.5	16.3	5	6	0	-100.0	0.0	20	0.136	0.000	-0.136	0.060 **	-100.0
All species pooled	**31**	**2033**	**2143**	**5.4**	**5.4**	**31**	**980**	**822**	**-16.1**	**8.5 ***	**31**	**0.482**	**0.384**	**-0.099**	**0.074**	**-20.4**
	Number increasing: 8/18 (44%)					Number decreasing: 13/18 (72%)**					Number decreasing: 12/18 (67%)					
NORTHEAST MAPS REGION																
Downy Woodpecker	52	79	53	-32.9	14.2 *	50	82	64	-22.0	13.4	62	1.038	1.208	0.170	0.313	16.3
"Traill's" Flycatcher	22	83	66	-20.5	16.5	10	2	8	300.0	333.3	22	0.024	0.121	0.097	0.039 **	403.0
Eastern Phoebe	27	41	29	-29.3	22.6	18	65	18	-72.3	9.7 ***	31	1.585	0.621	-0.965	0.487 **	-60.8
Red-eyed Vireo	54	175	127	-27.4	8.7 ***	13	14	9	-35.7	28.2	54	0.080	0.071	-0.009	0.039	-11.4
Blue Jay	35	47	47	0.0	22.8	13	10	23	130.0	149.9	36	0.213	0.489	0.277	0.195	130.0
Black-capped Chickadee	50	180	185	2.8	13.9	38	118	109	-7.6	16.7	54	0.656	0.589	-0.066	0.196	-10.1
Tufted Titmouse	43	61	55	-9.8	15.1	41	111	57	-48.6	9.6 ***	49	1.820	1.036	-0.783	0.459 *	-43.0
Carolina Wren	26	92	42	-54.3	10.6 ***	25	81	34	-58.0	13.6 ***	33	0.880	0.810	-0.071	0.284	-8.1
House Wren	19	54	48	-11.1	26.8	19	35	26	-25.7	29.8	22	0.648	0.542	-0.107	0.304	-16.4
Veery	40	235	197	-16.2	8.5 *	24	23	34	47.8	46.9	40	0.098	0.173	0.075	0.041 *	76.3
Hermit Thrush	18	64	29	-54.7	6.9 ***	15	20	12	-40.0	37.9	22	0.313	0.414	0.101	0.200	32.4
Wood Thrush	46	266	188	-29.3	6.7 ***	34	63	69	9.5	25.8	47	0.237	0.367	0.130	0.074 *	55.0
American Robin	53	243	266	9.5	16.7	39	133	113	-15.0	14.6	56	0.547	0.425	-0.123	0.146	-22.4
Gray Catbird	61	1030	937	-9.0	5.2 *	45	372	476	28.0	20.5	63	0.361	0.508	0.147	0.102	40.7
Cedar Waxwing	29	163	159	-2.5	20.5	2	2	5	150.0	500.0	29	0.012	0.031	0.019	0.028	156.3
Yellow Warbler	28	211	166	-21.3	6.1 ***	17	74	74	0.0	38.5	30	0.351	0.446	0.095	0.193	27.1
Chestnut-sided Warbler	18	51	48	-5.9	21.7	5	20	11	-45.0	16.9 *	18	0.392	0.229	-0.163	0.224	-41.6
Magnolia Warbler	14	38	40	5.3	36.3	6	15	5	-66.7	22.3 **	14	0.395	0.125	-0.270	0.169	-68.3
Black-thrtd. Green Warb.	15	39	26	-33.3	15.5 *	8	12	9	-25.0	27.5	18	0.308	0.346	0.039	0.294	12.5
Black-and-white Warbler	34	74	61	-17.6	14.2	20	21	35	66.7	53.6	39	0.284	0.574	0.290	0.164 *	102.2

TABLE 2. Continued.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2002	2003	%chg.	SE[b]	n[c]	2002	2003	%chg.	SE[d]	n[e]	2002	2003	change	SE[f]	%chg.
American Redstart	37	188	179	-4.8	20.5	18	61	59	-3.3	21.0	40	0.325	0.330	0.005	0.111	1.6
Worm-eating Warbler	25	54	72	33.3	27.8	12	46	46	0.0	22.5	27	0.852	0.639	-0.213	0.409	-25.0
Ovenbird	59	231	194	-16.0	9.3	39	70	101	44.3	30.1	62	0.303	0.521	0.218	0.105 **	71.8
Louisiana Waterthrush	16	27	24	-11.1	23.5	12	25	22	-12.0	22.6	18	0.926	0.917	-0.009	0.492	-1.0
Common Yellowthroat	47	300	304	1.3	9.7	28	51	75	47.1	32.1 *	48	0.170	0.247	0.077	0.055	45.1
Hooded Warbler	18	64	58	-9.4	19.2	8	15	20	33.3	36.2	19	0.234	0.345	0.111	0.191	47.1
Eastern Towhee	34	75	62	-17.3	16.9	20	32	22	-31.3	20.4	36	0.427	0.355	-0.072	0.132	-16.8
Chipping Sparrow	23	44	38	-13.6	15.9	12	9	15	66.7	91.9	26	0.205	0.395	0.190	0.196	93.0
Song Sparrow	33	216	167	-22.7	10.2 **	32	114	149	30.7	21.6	36	0.528	0.892	0.364	0.160 **	69.1
Swamp Sparrow	11	43	33	-23.3	20.4	7	26	38	46.2	55.7	13	0.605	1.152	0.547	0.465	90.4
Dark-eyed Junco	12	47	32	-31.9	8.4 **	11	51	103	102.0	105.1	14	1.085	3.219	2.134	1.461	196.6
Northern Cardinal	48	173	168	-2.9	9.5	31	31	58	87.1	49.8 ***	49	0.179	0.345	0.166	0.082 **	92.7
Indigo Bunting	30	81	67	-17.3	16.4	10	18	14	-22.2	36.9	31	0.222	0.209	-0.013	0.083	-6.0
Red-winged Blackbird	19	49	82	67.3	42.2 *	2	2	12	500.0	1200.0	19	0.041	0.146	0.106	0.120	258.5
Common Grackle	25	50	61	22.0	26.9	6	7	4	-42.9	36.6	25	0.140	0.066	-0.074	0.081	-53.2
Baltimore Oriole	25	33	31	-6.1	36.4	11	21	5	-76.2	15.0 ***	28	0.636	0.161	-0.475	0.195 **	-74.7
American Goldfinch	44	299	239	-20.1	6.3 **	2	2	0	-100.0	0.0	44	0.007	0.000	-0.007	0.004	-100.0
All species pooled	**76**	**5953**	**5225**	**-12.2**	**2.5 *** **	**76**	**2042**	**2132**	**4.4**	**7.1**	**76**	**0.343**	**0.408**	**0.065**	**0.040**	**19.0**
	Number decreasing: 29/37 (78%)***					Number increasing: 16/37 (43%)					Number increasing: 21/37 (57%)					
SOUTHEAST MAPS REGION																
Downy Woodpecker	23	29	31	6.9	27.4	16	37	28	-24.3	25.2	26	1.276	0.903	-0.373	0.470	-29.2
Acadian Flycatcher	24	109	111	1.8	14.2	7	5	3	-40.0	41.0	25	0.046	0.027	-0.019	0.026	-41.1
White-eyed Vireo	24	79	65	-17.7	10.5	18	32	20	-37.5	17.2 *	27	0.405	0.308	-0.097	0.144	-24.0
Red-eyed Vireo	26	128	140	9.4	14.3	5	2	6	200.0	193.6	26	0.016	0.043	0.027	0.029	174.3
Carolina Chickadee	29	79	29	-63.3	11.6 ***	22	61	36	-41.0	17.1 *	33	0.772	1.241	0.469	0.440	60.8
Tufted Titmouse	37	111	83	-25.2	12.1 *	25	88	51	-42.0	15.8 **	37	0.793	0.614	-0.178	0.191	-22.5
Carolina Wren	36	200	122	-39.0	6.4 ***	33	152	94	-38.2	12.2 **	37	0.760	0.771	0.011	0.252	1.4
Wood Thrush	27	214	162	-24.3	9.7 **	19	37	42	13.5	21.7	27	0.173	0.259	0.086	0.068	50.0
American Robin	9	22	23	4.5	32.2	8	20	31	55.0	141.1	10	0.909	1.348	0.439	0.909	48.3
Gray Catbird	15	58	34	-41.4	8.2 ***	5	56	38	-32.1	2.5 ***	17	0.966	1.118	0.152	0.655	15.8
Prairie Warbler	10	48	40	-16.7	19.3	8	12	18	50.0	51.2	12	0.250	0.450	0.200	0.128	80.0
Prothonotary Warbler	9	37	28	-24.3	16.0	1	14	1	-92.9		9	0.378	0.036	-0.343	0.199	-90.6
Worm-eating Warbler	18	47	38	-19.1	11.9	13	16	8	-50.0	25.2	19	0.340	0.211	-0.130	0.099	-38.2
Ovenbird	24	116	78	-32.8	12.8 **	16	34	30	-11.8	26.7	26	0.293	0.385	0.092	0.173	31.2

TABLE 2. Continued.

	ADULTS					YOUNG					REPRODUCTIVE INDEX					
Species	n[a]	2002	2003	%chg.	SE[b]	n[c]	2002	2003	%chg.	SE[d]	n[e]	2002	2003	change	SE[f]	%chg.
Louisiana Waterthrush	20	42	49	16.7	22.9	12	18	17	-5.6	41.5	21	0.429	0.347	-0.082	0.155	-19.0
Kentucky Warbler	15	62	55	-11.3	16.8	8	18	11	-38.9	33.3	15	0.290	0.200	-0.090	0.147	-31.1
Common Yellowthroat	24	100	80	-20.0	10.0	13	33	40	21.2	42.6	26	0.330	0.500	0.170	0.141	51.5
Hooded Warbler	18	72	68	-5.6	16.5	12	11	9	-18.2	39.8	19	0.153	0.132	-0.020	0.075	-13.4
Yellow-breasted Chat	10	54	43	-20.4	16.7	6	16	12	-25.0	21.0	10	0.296	0.279	-0.017	0.097	-5.8
Eastern Towhee	21	42	40	-4.8	17.7	10	7	10	42.9	67.3	23	0.167	0.250	0.083	0.132	50.0
Northern Cardinal	33	307	264	-14.0	9.9	29	117	103	-12.0	18.4	33	0.381	0.390	0.009	0.095	2.4
Indigo Bunting	24	109	98	-10.1	23.9	11	14	5	-64.3	25.3 **	25	0.128	0.051	-0.077	0.065	-60.3
American Goldfinch	14	90	47	-47.8	12.9 ***	2	0	2	++++		15	0.000	0.043	0.043	0.037	++++
All species pooled	**37**	**2609**	**2131**	**-18.3**	**3.4 *****	**37**	**942**	**748**	**-20.6**	**8.1 ****	**37**	**0.361**	**0.351**	**-0.010**	**0.056**	**-2.8**
	Number decreasing: 18/23 (78%)***					Number decreasing: 16/23 (70%)**					Number decreasing: 11/23 (48%)					
ALASKA AND BOREAL CANADA MAPS REGIONS																
Tennessee Warbler	3	13	5	-61.5	9.9 **	3	25	46	84.0	11.7	3	1.923	9.200	7.277	6.874	378.4
Yellow-rumped Warbler	3	14	14	0.0	61.9	3	5	77	1440.0	915.0	3	0.357	5.500	5.143	3.016	1440.0
All species pooled	**3**	**163**	**177**	**8.6**	**22.2**	**3**	**81**	**193**	**138.3**	**19.2 ****	**3**	**0.497**	**1.090**	**0.594**	**0.477**	**119.4**
	Number increasing: 0/2 (0%)					Number increasing: 2/2 (100%)					Number increasing: 2/2 (100%)					

[a] Number of stations at which at least one individual adult bird of the species was captured in either year.
[b] Standard error of the percent change in the number of adult birds captured.
[c] Number of stations at which at least one individual young bird of the species was captured in either year.
[d] Standard error of the percent change in the number of young birds captured.
[e] Number of stations at which at least one individual aged bird of the species was captured in either year.
[f] Standard error of the change in the reproductive index.
++++ Percent change undefined because no young were captured during the first year of the comparison.
* $0.05 \leq P < 0.10$; ** $0.01 \leq P < 0.05$; *** $P < 0.01$

program-wide, 64 species in the Northwest, 37 in the Southwest, 23 in the North-central, 18 in the South-central, 37 in the Northeast, 23 in the Southeast, and 2 in the combined Alaska and Boreal Canada regions.

(a) *Changes in adult populations* — Overall, the index of adult population size for all species pooled decreased substantially in 2003 in those regions where productivity was dramatically reduced during 2002. Indeed, the number of adults captured decreased between 2002 and 2003 in all regions except the South-central and Alaska/Boreal Canada regions (where it increased by non-significant 5.4% and 8.6%, respectively). The decreases in the Southwest (26.0%), Southeast (18.3%), and Northeast (12.2%) regions were highly significant, while the decreases in the Northwest (4.0%) and North-central (7.0%) regions were nearly significant and non-significant, respectively. Likewise, the proportions of decreasing species were highly significantly >50% in the Southwest (84%), Southeast (78%), and Northeast (78%) regions, and were nearly significantly and non-significantly >50% in the Northwest (59%) and North-central (65%) regions, respectively. This proportion was non significantly different from 50% in either the South-central or Alaska/Boreal Canada regions. Summing over these latter two regions, only one species showed a significant decrease in adult population size while no species showed a significant or nearly significant increase. In contrast, summing over the other five regions, 35 species had significant decreases in numbers of adults and an additional 10 species showed nearly significant decreases, while only eight species showed significant or nearly significant increases in numbers of adults.

Program-wide, the index for adult population size for all species pooled decreased by a highly significant 10.3%. The program-wide proportion of decreasing species (67%) was also highly significantly >50%. Program-wide, 20 species had significant decreases in numbers of adults and another 12 species had nearly significant decreases, while only four species showed significant or nearly significant increases.

(b) *Changes in productivity* — Overall, productivity generally increased in 2003 compared to 2002 in five of seven regions, but the only significant increase (30.9%) in number of young birds of all species pooled was in the Southwest Region. Non-significant increases in numbers of young birds of all species pooled in the other four regions ranged from 19.2% and 19.0% in the Alaska/Boreal Canada and North-central regions, respectively, to 7.8% and 4.4% in the Northwest and Northeast regions, respectively. In contrast, numbers of young birds of all species pooled showed significant and nearly significant decreases of 20.6% in the Southeast and 16.1% in the South-central regions, respectively. Changes in reproductive index for all species pooled generally paralleled changes in numbers of young with a highly significant 76.8% increase in the Southwest, non-significant increases in four other regions ranging from 12.2% in the Northwest to 28.1% in the North-central Region (and 119.4% in Alaska/Boreal Canada Region, which is based on only three stations in Boreal Canad(a), and non-significant decreases of 2.8% in the Southeast and 28.1% in the South-central regions, respectively. Although increases between 2002 and 2003 in the numbers of young and the reproductive index were generally not significant, the proportion of species with increasing numbers of young and the proportion of species with increasing reproductive indices were more often significantly >50%. Indeed, both proportions were highly significantly >50% for the Southwest (73% and 78% respectively), highly significantly and significantly greater for the Northwest (66% and 63%, respectively), nearly significantly and significantly greater, respectively, for the North-central region (both 70%), and non-significantly different than 50% for the Northeast (43% and 57%, respectively). Paralleling the decreases in numbers of young in the Southeast and South-central, the proportions of decreasing species there were significantly >50% (70% and 72% respectively). The proportions of species with decreasing reproductive indices in those regions, however, were not significantly different from 50%. Summing over the seven regions, 18 species had significant or nearly significant regional increases in numbers of young while 19 species had significant or nearly significant decreases. In contrast, again summing over the seven regions, 27 species had significant or nearly significant regional increases in reproductive index while only 12 species had significant or nearly significant decreases.

Program-wide, the number of young for all

species pooled increased by a nearly significant 9.1% while the reproductive index for all species pooled increased by a highly significant 21.6% from 0.391 in 2002 to 0.475 in 2003. The program-wide proportions of species with increasing numbers of young (61%) and increasing reproductive indices (66%) were both highly significantly >50%. Program-wide, 21 species had significant or nearly significant increases in numbers of young, while 13 species had significant or nearly significant decreases. Similarly, and again program-wide, 22 species had significant or nearly significant increases in reproductive indices, while only eight showed significant or nearly significant decreases.

3. *Twelve-year (1992-2003) program-wide trends* — Chained indices of adult population size (Fig. 3a) and productivity (Fig. 3b) for all species pooled at the program-wide scale showed a highly significant ($P < 0.001$) decreasing trend in adult population size of -1.86% per year, and a widely fluctuating temporal pattern in reproductive index with a decreasing tendency of -1.02% per year. Interestingly, all five decreases in productivity were followed by decreases in adult population size the next year, while three of the five increases in productivity were followed by increases in adult population size the next year. Moreover, seven of the eight significant or nearly significant changes in productivity were followed the next year by changes of adult population size of the same sign, while only one of two non-significant changes in productivity was followed the next year by a change of adult population size of the same sign.

SURVIVAL-RATE ESTIMATES

Maximum-likelihood estimates of time-constant annual adult apparent survival rates, recapture probabilities, and proportions of residents among the newly captured adults that were not recaptured seven or more days later during their first year of capture are presented in Table 3 for species that met survivorship selection criteria (see Methods - Data Analysis) for each of the seven MAPS regions and program-wide. These estimates were derived from 12 years (1992-2003) of mark-recapture data pooled over all stations in each region (or program-wide) that were operated for four or more consecutive years during this period. Data were thus pooled from 550 stations program-wide, and from 151 stations in the Northwest, 83 in the Southwest, 44 in the North-central, 71 in the South-central, 91 in the Northeast, 79 in the Southeast, and 31 in the Alaska/Boreal Canada region, for an average of 79 stations per region (Table 4). The regional increases for the 12-yr period (1992-2003) over the 10-yr period (1992-2001) in the number of stations contributing data to survivorship analyses ranged from 7% in the Alaska/Boreal Canada Region to 25% in the Northeast and averaged 15%, which was also the program-wide increase.

Tables 3 and 4 show that 184 species fulfilled selection criteria for survivorship analyses program-wide, while 81 species fulfilled these criteria in the Northwest Region, 86 in the Southwest, 54 in the North-central, 62 in the South-central, 75 in the Northeast, 45 in the Southeast, and 34 in the Alaska/Boreal Canada Region, for an average of 62 species per region. Changes in the number of species per region that fulfilled selection criteria for survivorship analyses ranged from -5.6% in the Alaska/Boreal Canada Region to 19.4% in the Southwest and averaged 5.4%; the program-wide change was an increase of 2.2%.

Also included in Table 3 for each species in each region are the number of stations from which data were pooled and the total number of individual adult birds captured during the 10 years, as well as the total number of captures and total number of returns of those individuals. The mean number of individual adult birds captured per station per species during the 12 years (1992-2003) was lowest for the Northeast (22.7) and Southeast (23.8) regions, higher for the South-central Region (32.2), higher still for the Southwest (35.4), North-central (36.7), and Northwest (36.8) regions, and highest for the Alaska/Boreal Canada Region (51.0). Altogether, the 550 stations included in these survivorship analysis were operated for an average of 7.70 years each (67 stations for four years, 109 for five, 44 for six, 58 for seven, 40 for eight, 66 for nine, 56 for 10, 40 for 11, and 70 for12 years) and produced an average capture rate of 4.23 adult individuals per station per species per year.

As in past years, the average total number of adult captures per individual per species (for species that met survivorship selection criteria) was remarkably constant over the seven regions,

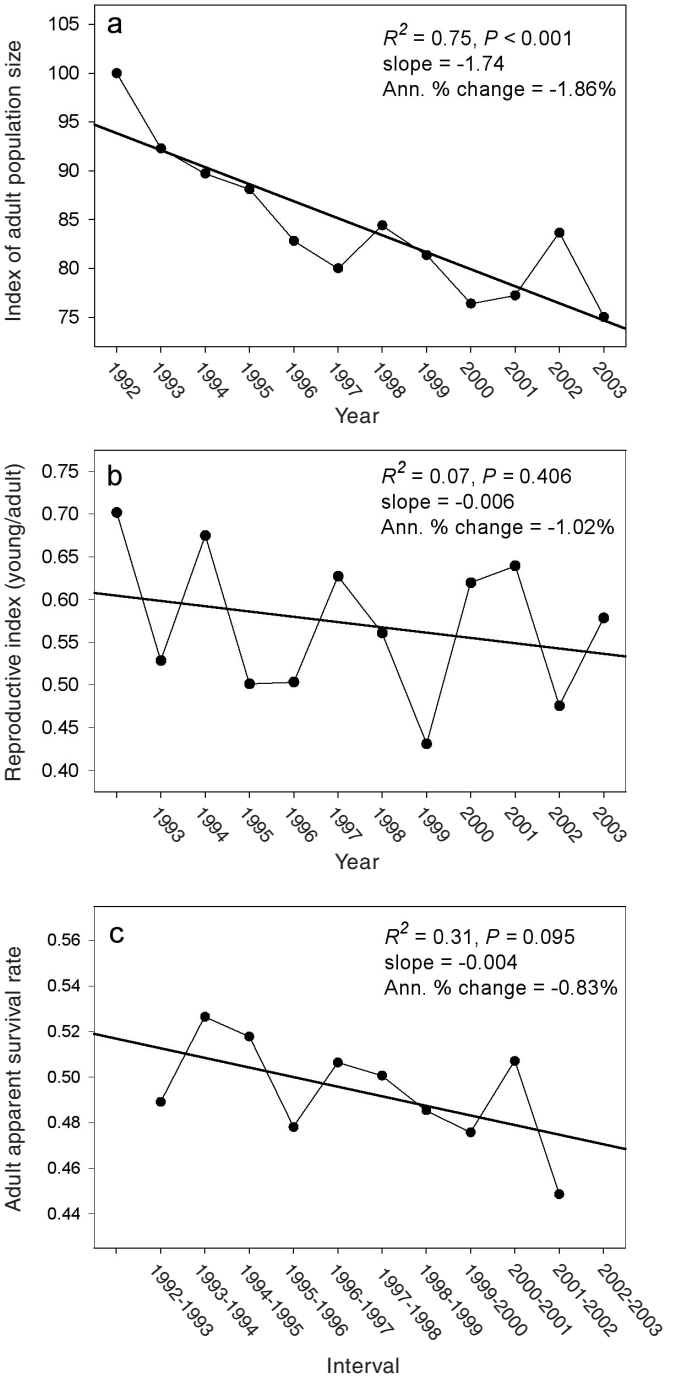

FIGURE 3. Program-wide 12-yr (1992-2003) trends for all species pooled for a) adult population size and b) productivity (reproductive index: young/adult) from chain indices of constant-effort year-to-year changes derived from the analysis of >722,000 captures of >527,000 aged individuals, and c) the program-wide 10-yr trend for all species pooled for adult annual apparent survival rate from the fully time-dependent CJS mark-recapture model applied to >319,000 capture histories of individual adult birds.

TABLE 3. Program-wide and regional time-constant estimates of annual adult apparent survival probability, recapture probability, and proportion of residents from modified Cormack-Jolly-Seber mark-recapture analyses[a] (using transient models[b]), and selected and equivalent time-dependent models from twelve years (1992-2003) of MAPS data.

					Survival				Recapture				Proportion of							
					Survival probability[h]				Recapture probability[j]				Proportion of residents[k]				Models selected[l]			
Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	p	SE(p)	CV(p)	$w(p_i)$[i]	τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	1	2	3	4
PROGRAM-WIDE																				
Common Ground-Dove†	10	479	536	12	0.453	0.154	34.0	0.003	0.042	0.043	101.2	0.002	1.000	0.952	95.2	0.001	...			
Yellow-billed Cuckoo	95	603	648	18	0.480	0.098	20.4	0.028	0.187	0.093	49.8	0.253	0.200	0.107	53.5	0.004	...			
Belted Kingfisher*†	9	28	43	5	0.299	0.174	58.2	0.000	0.435	0.347	79.7	0.000	1.000	0.993	99.3	0.000	...			
Acorn Woodpecker	11	70	84	8	0.463	0.177	38.1	0.000	0.727	0.229	31.5	0.000	0.234	0.146	62.7	0.000	...			
Golden-fronted Woodpecker*†	7	145	180	8	0.179	0.115	64.4	0.012	0.343	0.301	87.8	0.002	1.000	0.886	88.6	0.001	...			
Red-bellied Woodpecker	101	429	481	29	0.423	0.079	18.6	0.001	0.147	0.073	49.7	0.022	0.754	0.387	51.3	0.002	...			
Williamson's Sapsucker	14	189	248	17	0.382	0.095	24.9	0.006	0.260	0.119	45.6	0.774	0.560	0.267	47.7	0.002	.t.			
Yellow-bellied Sapsucker	16	143	197	19	0.486	0.098	20.2	0.017	0.335	0.124	37.0	0.011	0.522	0.233	44.6	0.042	...			
Red-naped Sapsucker	34	614	1090	155	0.479	0.032	6.8	0.001	0.537	0.050	9.3	0.011	0.505	0.072	14.2	0.001	...			
R.-naped x R.-breasted Hybrid	6	62	118	16	0.537	0.110	20.4	0.012	0.399	0.136	34.0	0.027	0.648	0.280	43.2	0.023	...			
Red-breasted Sapsucker	52	898	1448	156	0.456	0.033	7.3	0.007	0.410	0.047	11.5	0.018	0.561	0.081	14.4	0.011	...			
Ladder-backed Woodpecker	22	147	193	27	0.610	0.090	14.7	0.000	0.324	0.096	29.4	0.002	0.519	0.184	35.5	0.001	...			
Nuttall's Woodpecker	26	319	483	69	0.596	0.052	8.7	0.000	0.374	0.061	16.4	0.001	0.476	0.099	20.9	0.029	...			
Downy Woodpecker	264	2508	3239	316	0.509	0.024	4.7	0.000	0.354	0.030	8.5	0.001	0.376	0.039	10.4	0.001	...			
Hairy Woodpecker	171	800	1006	127	0.666	0.035	5.3	0.027	0.199	0.031	15.3	0.006	0.520	0.088	17.0	0.073	...			
Three-toed Woodpecker	4	28	40	6	0.775	0.120	15.5	0.000	0.335	0.156	46.7	0.000	0.101	0.104	102.2	0.000	...			
Northern Flicker	166	684	783	36	0.433	0.072	16.6	0.000	0.129	0.055	42.4	0.002	0.627	0.270	43.0	0.003	...			
Olive-sided Flycatcher	20	125	164	17	0.708	0.083	11.7	0.002	0.388	0.107	27.6	0.002	0.086	0.045	53.1	0.001	...			
Western Wood-Pewee	84	1859	2511	281	0.500	0.025	5.1	0.036	0.346	0.032	9.2	0.214	0.508	0.056	11.0	0.766	..t			
Eastern Wood-Pewee	115	811	1005	86	0.524	0.046	8.8	0.000	0.356	0.057	16.0	0.031	0.298	0.059	19.9	0.009	...			
Acadian Flycatcher	82	3205	4648	592	0.491	0.017	3.5	0.014	0.529	0.026	4.8	0.020	0.375	0.027	7.2	0.374	...	..t		
"Traill's" Flycatcher	88	3790	5444	498	0.482	0.018	3.8	0.011	0.501	0.027	5.5	0.002	0.271	0.022	8.0	0.018	...			
Least Flycatcher	31	1414	1891	150	0.400	0.034	8.4	0.013	0.433	0.053	12.3	0.271	0.374	0.057	15.2	0.002	...	.t.		
Hammond's Flycatcher	56	1353	1940	219	0.442	0.027	6.2	0.132	0.412	0.041	9.8	0.025	0.509	0.063	12.3	0.001	...			
Dusky Flycatcher	50	2527	3758	358	0.499	0.021	4.2	0.998	0.417	0.029	7.0	0.008	0.307	0.029	9.6	0.004	t..			
"Western" Flycatcher	75	3209	4059	307	0.503	0.023	4.7	0.769	0.325	0.029	8.9	0.189	0.299	0.032	10.6	0.284	t..	t.t		
Black Phoebe	26	268	325	27	0.486	0.081	16.7	0.002	0.411	0.113	27.6	0.031	0.278	0.098	35.1	0.001	...			
Eastern Phoebe	46	391	511	30	0.457	0.073	15.9	0.109	0.388	0.102	26.2	0.070	0.208	0.070	33.7	0.051	...			
Vermilion Flycatcher†	5	102	121	10	0.368	0.154	42.0	0.000	0.227	0.184	81.4	0.000	1.000	0.862	86.2	0.000	...			
Ash-throated Flycatcher	54	1172	1353	109	0.645	0.045	7.0	0.006	0.205	0.038	18.6	0.002	0.373	0.075	20.2	0.182	...			
Great Crested Flycatcher	114	699	796	64	0.644	0.050	7.8	0.453	0.188	0.044	23.1	0.040	0.332	0.084	25.3	0.062	...	t..		

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
Brown-crested Flycatcher	9	294	375	47	0.496	0.066	13.4	0.005	0.296	0.083	28.0	0.015	0.736	0.243	33.1	0.004	...			
Eastern Kingbird	39	251	288	16	0.459	0.108	23.5	0.270	0.435	0.159	36.5	0.003	0.200	0.096	48.2	0.027	...	t..		
White-eyed Vireo	89	3572	6343	808	0.504	0.014	2.8	0.077	0.513	0.021	4.1	0.270	0.427	0.027	6.3	0.005	...	.t.		
Bell's Vireo	18	650	1017	141	0.567	0.033	5.9	0.004	0.402	0.044	11.0	0.487	0.448	0.066	14.6	0.025	...	.t.		
Yellow-throated Vireo	18	60	68	6	0.617	0.173	28.1	0.000	0.161	0.144	89.0	0.000	0.494	0.488	98.9	0.000	...			
Plumbeous Vireo	10	95	129	19	0.616	0.103	16.7	0.002	0.441	0.126	28.7	0.001	0.354	0.140	39.6	0.000	...			
Cassin's Vireo	32	573	681	40	0.566	0.064	11.3	0.002	0.151	0.049	32.5	0.007	0.422	0.144	34.0	0.007	...			
Blue-headed Vireo	15	151	187	13	0.393	0.115	29.3	0.001	0.205	0.125	61.0	0.004	0.712	0.443	62.2	0.001	...			
Hutton's Vireo	20	133	185	20	0.568	0.096	16.9	0.001	0.282	0.100	35.5	0.018	0.457	0.188	41.3	0.024	...			
Warbling Vireo	133	6243	8817	877	0.490	0.014	2.8	0.003	0.414	0.019	4.6	0.003	0.352	0.021	6.1	1.000	..t			
Red-eyed Vireo	182	5774	7534	850	0.578	0.014	2.4	0.508	0.257	0.015	5.7	0.348	0.495	0.032	6.5	0.016	t..	...	.t.	
Gray Jay†	21	105	153	35	0.626	0.064	10.2	0.076	0.262	0.069	26.2	0.002	1.000	0.295	29.5	0.002	...			
Steller's Jay	63	365	429	45	0.713	0.055	7.8	0.001	0.166	0.044	26.8	0.499	0.413	0.119	28.8	0.002	...	.t.		
Blue Jay	158	1062	1164	72	0.645	0.049	7.6	0.004	0.111	0.032	29.2	0.018	0.441	0.134	30.5	0.498	...	..t		
Green Jay*†	3	28	32	3	0.940	0.268	28.5	0.000	0.034	0.083	247.9	0.000	1.000	2.428	242.8	0.000	...			
Western Scrub-Jay	36	181	210	21	0.554	0.090	16.3	0.002	0.225	0.094	41.8	0.000	0.501	0.231	46.1	0.100	...			
Mexican Jay*	3	38	46	3	0.366	0.223	60.9	0.000	0.289	0.312	108.0	0.000	0.486	0.560	115.1	0.000	...			
Tree Swallow	48	815	1053	65	0.392	0.050	12.8	0.003	0.276	0.066	23.8	0.001	0.517	0.134	25.9	0.004	...			
Violet-green Swallow	9	189	238	16	0.460	0.101	22.0	0.044	0.213	0.101	47.5	0.601	0.442	0.223	50.4	0.078	.t.	...		
N. Rough-winged Swallow	20	126	136	7	0.384	0.175	45.5	0.000	0.645	0.283	43.8	0.001	0.158	0.117	74.0	0.000	...			
Barn Swallow	15	406	492	37	0.478	0.063	13.2	0.329	0.186	0.061	32.7	0.329	0.543	0.188	34.6	0.017	...	t..	.t.	
Carolina Chickadee	135	1677	1972	137	0.491	0.037	7.4	0.001	0.198	0.035	17.6	0.004	0.502	0.094	18.8	0.000	...			
Black-capped Chickadee	168	3931	5550	619	0.471	0.017	3.6	0.029	0.366	0.023	6.2	0.004	0.559	0.041	7.4	0.007	...			
Mountain Chickadee	53	1484	1888	168	0.437	0.032	7.4	0.052	0.330	0.043	13.0	0.034	0.512	0.077	15.0	0.004	...			
Chestnut-backed Chickadee	52	1375	1801	174	0.421	0.033	7.8	0.008	0.378	0.047	12.4	0.050	0.525	0.077	14.7	0.017	...			
Boreal Chickadee	11	135	202	29	0.446	0.075	16.9	0.073	0.336	0.102	30.3	0.120	0.881	0.307	34.9	0.004	...			
Bridled Titmouse	6	40	56	10	0.642	0.161	25.2	0.000	0.256	0.143	55.9	0.000	0.845	0.498	58.9	0.000	...			
Oak Titmouse	20	278	418	50	0.529	0.058	11.0	0.000	0.395	0.076	19.2	0.001	0.423	0.107	25.3	0.029	...			
Juniper Titmouse	4	51	93	19	0.586	0.095	16.3	0.000	0.482	0.130	26.8	0.000	0.630	0.243	38.5	0.000	...			
Tufted Titmouse	161	2557	3522	450	0.465	0.020	4.3	0.997	0.405	0.028	7.0	0.018	0.574	0.050	8.7	0.003	t..			
Black-crested Titmouse	19	312	407	45	0.498	0.063	12.6	0.004	0.214	0.062	29.0	0.002	0.821	0.253	30.8	0.007	...			
Verdin*	5	71	88	5	0.522	0.221	42.3	0.000	0.126	0.137	108.7	0.000	0.658	0.695	105.5	0.000	...			
Bushtit	57	1945	2320	122	0.359	0.041	11.3	0.965	0.209	0.045	21.3	0.133	0.660	0.143	21.7	0.041	t..			
Red-breasted Nuthatch	87	728	808	31	0.337	0.077	22.9	0.002	0.117	0.069	58.5	0.002	0.835	0.493	59.1	0.008	...			

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival: Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture: Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of: Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
White-breasted Nuthatch	107	485	582	43	0.442	0.066	15.0	0.002	0.303	0.085	28.0	0.003	0.436	0.140	32.0	0.001	...			
Brown Creeper	66	839	1045	61	0.313	0.052	16.7	0.007	0.259	0.076	29.2	0.018	0.757	0.232	30.6	0.001	...			
Carolina Wren	138	3726	6075	664	0.379	0.015	3.9	1.000	0.595	0.027	4.6	0.018	0.470	0.033	7.0	0.007	t..			
Bewick's Wren	95	2485	4071	503	0.428	0.018	4.3	0.179	0.560	0.030	5.4	0.027	0.528	0.042	7.9	0.167	...			
House Wren	116	3793	5517	388	0.341	0.020	5.7	0.072	0.406	0.034	8.3	0.044	0.501	0.048	9.6	0.016	...			
Winter Wren	46	1101	1777	145	0.362	0.031	8.4	0.333	0.516	0.058	11.2	0.121	0.388	0.060	15.4	0.016	...	t..		
Golden-crowned Kinglet*	69	1188	1490	18	0.149	0.075	50.5	0.079	0.235	0.150	63.8	0.009	0.314	0.150	47.6	0.044	...			
Ruby-crowned Kinglet	34	1058	1322	51	0.302	0.055	18.4	0.733	0.252	0.076	30.2	0.180	0.480	0.144	30.1	0.023	t..			
Arctic Warbler	2	259	481	52	0.324	0.050	15.6	0.029	0.630	0.104	16.5	0.003	0.648	0.163	25.2	0.001	...			
Blue-gray Gnatcatcher	100	767	847	26	0.401	0.087	21.7	0.010	0.111	0.065	59.0	0.371	0.557	0.333	59.7	0.042	...	.t.		
Eastern Bluebird	40	255	352	17	0.404	0.096	23.8	0.014	0.274	0.115	42.2	0.081	0.323	0.148	46.0	0.018	...			
Western Bluebird	17	148	201	13	0.321	0.095	29.5	0.001	0.570	0.205	36.0	0.004	0.279	0.145	51.9	0.015	...			
Townsend's Solitaire*†	4	29	33	3	0.571	0.214	37.5	0.000	0.090	0.154	171.4	0.000	1.000	1.771	177.1	0.000	...			
Veery	61	2709	5246	1011	0.587	0.013	2.2	0.017	0.563	0.018	3.2	0.029	0.499	0.026	5.3	0.011	...			
Gray-cheeked Thrush	6	253	539	74	0.441	0.044	10.1	0.000	0.705	0.072	10.2	0.000	0.527	0.108	20.4	0.001	...			
Bicknell's Thrush	1	28	45	10	0.613	0.124	20.3	0.000	0.318	0.150	47.2	0.000	0.840	0.479	57.0	0.000	...			
Swainson's Thrush	115	12214	26195	4245	0.585	0.006	1.1	0.000	0.621	0.009	1.4	0.000	0.366	0.010	2.8	0.998	..t			
Hermit Thrush	82	2513	4428	629	0.467	0.016	3.4	0.280	0.609	0.026	4.2	0.074	0.468	0.033	7.0	0.032	...	t..		
Wood Thrush	138	6057	10153	1000	0.435	0.012	2.8	0.995	0.494	0.020	4.1	0.993	0.409	0.023	5.7	0.001	tt.			
American Robin	307	9936	12804	1206	0.508	0.012	2.4	0.998	0.267	0.013	5.0	0.003	0.516	0.029	5.6	0.002	t..			
Varied Thrush	41	551	718	57	0.431	0.052	12.1	0.122	0.375	0.076	20.2	0.547	0.356	0.087	24.6	0.001	.t.	...		
Wrentit	46	2232	4521	722	0.594	0.015	2.6	0.973	0.538	0.021	3.9	0.897	0.412	0.028	6.8	0.198	tt.			
Gray Catbird	137	12026	19272	2410	0.511	0.008	1.7	0.007	0.455	0.012	2.6	0.004	0.450	0.016	3.6	0.002	...			
Northern Mockingbird	34	539	658	18	0.286	0.088	31.0	0.077	0.197	0.106	53.8	0.015	0.418	0.213	51.0	0.066	...			
Brown Thrasher	60	756	974	94	0.572	0.041	7.2	0.001	0.235	0.041	17.6	0.049	0.462	0.091	19.8	0.001	...			
Long-billed Thrasher	4	176	237	34	0.582	0.083	14.2	0.004	0.381	0.097	25.3	0.141	0.626	0.204	32.6	0.000	...			
California Thrasher†	15	134	173	21	0.690	0.108	15.7	0.007	0.121	0.061	50.0	0.005	1.000	0.498	49.8	0.000	...			
European Starling*†	31	207	215	3	0.299	0.248	82.9	0.001	0.049	0.143	293.5	0.001	1.000	2.897	289.7	0.000	...			
Cedar Waxwing	92	4167	4582	23	0.530	0.093	17.5	0.001	0.024	0.013	53.2	0.002	0.231	0.116	50.1	0.015	...			
Blue-winged Warbler	35	1128	1646	189	0.523	0.029	5.6	0.001	0.382	0.039	10.1	0.007	0.402	0.052	13.0	0.001	...			
Orange-crowned Warbler	77	4652	6475	552	0.423	0.017	4.0	0.232	0.459	0.027	5.9	0.379	0.357	0.028	7.8	0.024	...	.t.	t..	
Nashville Warbler	34	1305	1575	70	0.339	0.047	13.9	0.077	0.354	0.075	21.3	0.562	0.301	0.071	23.7	0.034	.t.	...		
Virginia's Warbler	13	609	744	52	0.440	0.058	13.1	0.002	0.317	0.076	24.1	0.817	0.401	0.110	27.5	0.001	.t.			
Lucy's Warbler	8	401	505	48	0.466	0.065	13.9	0.004	0.317	0.080	25.1	0.000	0.567	0.160	28.3	0.002	...			

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival: Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture: Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of: Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
Northern Parula	45	475	542	32	0.358	0.073	20.3	0.002	0.515	0.131	25.5	0.007	0.247	0.084	34.1	0.023	...			
Yellow Warbler	151	12139	19262	2445	0.534	0.009	1.6	0.001	0.474	0.012	2.5	0.002	0.401	0.014	3.5	0.120	...			
Chestnut-sided Warbler	22	929	1551	189	0.448	0.029	6.4	0.110	0.506	0.046	9.0	0.019	0.518	0.067	12.9	0.119	...			
Magnolia Warbler	17	655	1039	101	0.391	0.039	10.0	0.995	0.659	0.071	10.8	0.008	0.320	0.058	18.1	0.000	t..			
Black-throated Blue Warbler	8	134	184	22	0.492	0.089	18.1	0.001	0.451	0.127	28.2	0.000	0.409	0.155	38.0	0.007	...			
Yellow-rumped Warbler	99	5162	6340	466	0.453	0.020	4.3	0.001	0.263	0.023	8.6	0.077	0.464	0.044	9.5	0.001	...			
Black-throated Gray Warbler	20	174	200	7	0.441	0.165	37.5	0.006	0.066	0.072	108.8	0.004	0.911	0.960	105.4	0.001	...			
Black-throated Green Warbler	23	486	730	85	0.391	0.045	11.5	0.002	0.546	0.078	14.3	0.017	0.515	0.101	19.6	0.047	...			
Townsend's Warbler	29	1191	1482	109	0.437	0.040	9.2	0.002	0.205	0.042	20.5	0.004	0.665	0.144	21.6	0.004	...			
Hermit Warbler	32	1275	1399	43	0.597	0.063	10.6	0.018	0.099	0.033	33.7	0.004	0.271	0.093	34.4	0.004	...			
Blackburnian Warbler	5	46	57	5	0.566	0.189	33.5	0.000	0.106	0.111	104.4	0.000	0.899	0.946	105.2	0.000	...			
Pine Warbler	35	245	287	12	0.345	0.128	37.1	0.001	0.292	0.175	59.7	0.008	0.363	0.228	62.9	0.001	...			
Prairie Warbler	28	676	908	82	0.457	0.048	10.5	0.007	0.299	0.057	19.0	0.047	0.526	0.112	21.4	0.001	...			
Blackpoll Warbler	8	184	280	23	0.302	0.068	22.4	0.000	0.733	0.152	20.7	0.000	0.320	0.124	38.8	0.003	...			
Black-and-white Warbler	82	1346	1758	179	0.530	0.032	5.9	0.170	0.312	0.037	11.9	0.018	0.436	0.061	14.1	0.064	...			
American Redstart	69	3913	5666	569	0.502	0.017	3.4	0.221	0.346	0.022	6.3	0.093	0.445	0.034	7.7	0.769	..t	...	t.t	
Prothonotary Warbler	23	711	923	74	0.457	0.048	10.5	0.011	0.237	0.053	22.2	0.004	0.613	0.147	23.9	0.002	...			
Worm-eating Warbler	31	946	1339	148	0.547	0.034	6.3	0.004	0.421	0.045	10.8	0.029	0.337	0.049	14.5	0.002	...			
Swainson's Warbler	9	149	249	22	0.525	0.090	17.1	0.029	0.305	0.102	33.4	0.855	0.529	0.208	39.4	0.018	.t.			
Ovenbird	126	4655	6833	866	0.552	0.014	2.5	0.004	0.426	0.019	4.4	0.004	0.380	0.023	6.0	0.003	...			
Northern Waterthrush	23	615	936	107	0.503	0.039	7.8	0.254	0.581	0.059	10.1	0.058	0.282	0.049	17.2	0.025	...	t..		
Louisiana Waterthrush	38	697	1218	152	0.505	0.034	6.7	0.004	0.608	0.050	8.3	0.032	0.353	0.050	14.3	0.002	...			
Kentucky Warbler	60	2266	4051	629	0.537	0.016	3.0	0.011	0.571	0.024	4.1	0.004	0.415	0.029	7.0	0.004	...			
Mourning Warbler	9	272	460	59	0.445	0.052	11.6	0.053	0.439	0.079	18.0	0.023	0.701	0.163	23.2	0.001	...			
MacGillivray's Warbler	99	7431	14402	1787	0.483	0.010	2.0	0.857	0.600	0.015	2.5	0.005	0.404	0.017	4.2	0.118	t..			
Common Yellowthroat	213	11335	19082	2069	0.478	0.009	1.8	0.022	0.504	0.014	2.7	0.002	0.382	0.015	3.9	0.263	...	..t		
Hooded Warbler	53	1556	2687	305	0.470	0.023	4.9	0.016	0.537	0.036	6.7	0.002	0.390	0.040	10.2	0.118	...			
Wilson's Warbler	85	10861	16282	1278	0.405	0.011	2.6	0.026	0.532	0.019	3.5	0.116	0.277	0.014	5.1	1.000	..t			
Canada Warbler	11	380	571	58	0.456	0.053	11.6	0.091	0.531	0.084	15.7	0.003	0.329	0.077	23.5	0.245	...	..t		
Yellow-breasted Chat	80	4003	6742	893	0.489	0.014	2.8	0.900	0.482	0.020	4.2	0.120	0.492	0.029	5.9	0.146	t..			
Summer Tanager	69	883	1179	138	0.535	0.038	7.1	0.071	0.355	0.045	12.8	0.028	0.474	0.074	15.6	0.069	...			
Scarlet Tanager	93	750	855	44	0.557	0.063	11.2	0.007	0.090	0.035	39.1	0.007	0.625	0.246	39.3	0.048	...			
Western Tanager	89	2296	2528	134	0.521	0.038	7.3	0.000	0.136	0.030	22.3	0.001	0.510	0.119	23.4	0.000	...			
Olive Sparrow	4	241	465	75	0.511	0.048	9.4	0.002	0.757	0.065	8.6	0.004	0.503	0.099	19.8	0.007	...			

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival: Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture: Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of: Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
Green-tailed Towhee	18	431	639	81	0.616	0.048	7.8	0.007	0.307	0.051	16.5	0.007	0.477	0.094	19.7	0.002	...			
Spotted Towhee	100	3474	5196	707	0.500	0.016	3.2	0.071	0.435	0.022	5.2	0.178	0.560	0.037	6.6	0.002	...			
Eastern Towhee	114	1140	1612	197	0.469	0.030	6.4	0.002	0.355	0.040	11.1	0.003	0.623	0.083	13.3	0.001	...			
Canyon Towhee*†	4	56	69	3	0.926	0.290	31.3	0.000	0.025	0.036	143.5	0.000	1.000	1.392	139.2	0.000	...			
California Towhee	32	713	991	142	0.562	0.037	6.6	0.006	0.329	0.042	12.9	0.005	0.607	0.092	15.1	0.878	..t			
Abert's Towhee	5	131	173	16	0.486	0.126	25.9	0.000	0.390	0.157	40.3	0.000	0.389	0.189	48.7	0.001	...			
Rufous-crowned Sparrow	19	269	402	43	0.528	0.065	12.3	0.076	0.320	0.076	23.7	0.002	0.508	0.139	27.5	0.003	...			
American Tree Sparrow	7	203	338	35	0.460	0.063	13.8	0.001	0.548	0.104	19.0	0.001	0.335	0.103	30.6	0.002	...			
Chipping Sparrow	93	1802	2273	159	0.427	0.033	7.7	0.018	0.216	0.036	16.5	0.018	0.645	0.112	17.4	0.011	...			
Clay-colored Sparrow	7	365	446	21	0.465	0.101	21.7	0.011	0.340	0.120	35.4	0.041	0.209	0.087	41.6	0.004	...			
Field Sparrow	76	2365	3409	377	0.443	0.021	4.6	0.010	0.346	0.028	8.1	0.810	0.621	0.059	9.6	0.001	.t.			
Vesper Sparrow	5	67	87	13	0.736	0.098	13.3	0.003	0.263	0.104	39.5	0.003	0.331	0.158	47.8	0.001	...			
Lark Sparrow	18	482	523	23	0.453	0.090	19.9	0.018	0.259	0.104	40.2	0.019	0.242	0.107	44.0	0.006	...			
Black-throated Sparrow*	11	175	186	5	0.597	0.202	33.7	0.002	0.087	0.092	106.1	0.005	0.291	0.309	106.3	0.004	...			
Sage Sparrow*†	2	99	104	3	0.496	0.277	55.8	0.001	0.037	0.093	254.1	0.000	1.000	2.485	248.5	0.000	...			
Savannah Sparrow	15	609	838	120	0.574	0.043	7.4	0.018	0.372	0.048	13.0	0.011	0.486	0.080	16.5	0.000	...			
Grasshopper Sparrow	9	236	350	35	0.438	0.069	15.7	0.068	0.360	0.096	26.6	0.471	0.564	0.176	31.3	0.003	...	.t.		
Fox Sparrow	42	1157	1956	239	0.523	0.026	4.9	0.432	0.489	0.037	7.6	0.235	0.375	0.043	11.6	0.577	t.t	.t.	..t	...
Song Sparrow	217	13799	26064	3314	0.478	0.007	1.5	0.266	0.540	0.011	2.0	0.075	0.485	0.015	3.1	0.012	...	t..		
Lincoln's Sparrow	54	2912	6752	819	0.428	0.013	3.1	0.119	0.610	0.023	3.8	0.012	0.581	0.037	6.3	0.010	...			
Swamp Sparrow	16	440	784	88	0.447	0.042	9.3	0.904	0.677	0.068	10.1	0.027	0.309	0.061	19.7	0.097	t..			
White-throated Sparrow	22	1176	1965	159	0.342	0.029	8.5	0.009	0.504	0.056	11.1	0.335	0.509	0.074	14.6	0.127	...	.t.		
White-crowned Sparrow	31	1416	2377	294	0.450	0.023	5.0	0.004	0.464	0.035	7.6	0.007	0.557	0.058	10.4	0.029	...			
Golden-crowned Sparrow	5	281	539	76	0.498	0.043	8.6	0.006	0.522	0.067	12.9	0.118	0.522	0.107	20.4	0.001	...			
Dark-eyed Junco	127	7781	13192	1622	0.436	0.010	2.3	0.923	0.505	0.016	3.2	0.085	0.536	0.024	4.4	0.002	t..			
Northern Cardinal	205	7990	11797	1684	0.546	0.010	1.9	0.577	0.380	0.013	3.4	0.084	0.543	0.023	4.3	0.003	t..	...		
Pyrrhuloxia*	2	129	134	3	0.955	0.252	26.4	0.000	0.230	0.206	89.7	0.000	0.035	0.032	91.9	0.000	...			
Rose-breasted Grosbeak	54	859	1013	60	0.448	0.056	12.5	0.006	0.238	0.062	25.9	0.617	0.414	0.118	28.4	0.009	.t.	...		
Black-headed Grosbeak	119	4824	6191	636	0.539	0.017	3.1	0.340	0.290	0.019	6.5	0.031	0.441	0.033	7.5	0.076	...	t..		
Blue Grosbeak	31	405	481	36	0.431	0.076	17.7	0.025	0.281	0.093	33.1	0.002	0.554	0.205	37.0	0.009	...			
Lazuli Bunting	52	2111	2660	179	0.489	0.031	6.3	0.007	0.284	0.035	12.3	0.009	0.310	0.044	14.1	0.271	...	..t		
Indigo Bunting	130	4927	6958	774	0.475	0.015	3.1	0.420	0.384	0.020	5.3	0.182	0.488	0.032	6.5	0.007	...	t..		
Varied Bunting*†	2	69	80	5	0.365	0.282	77.4	0.000	0.208	0.315	151.6	0.000	1.000	1.630	163.0	0.000	...			
Painted Bunting	34	2013	2745	331	0.548	0.024	4.3	0.028	0.456	0.032	7.0	0.044	0.330	0.032	9.6	0.171	...			

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
Dickcissel	15	697	784	29	0.438	0.073	16.6	0.004	0.230	0.084	36.7	0.007	0.285	0.116	40.6	0.028	...			
Red-winged Blackbird	94	2647	2950	161	0.586	0.036	6.2	0.666	0.166	0.028	16.7	0.303	0.331	0.058	17.6	0.252	t..			
Eastern Meadowlark	12	55	65	5	0.590	0.168	28.4	0.000	0.347	0.213	61.4	0.000	0.219	0.175	80.2	0.000	...			
Common Grackle	57	1192	1236	26	0.426	0.085	19.9	0.011	0.098	0.067	68.6	0.053	0.349	0.249	71.4	0.025	...			
Bronzed Cowbird	4	84	104	10	0.444	0.141	31.7	0.000	0.319	0.190	59.7	0.000	0.614	0.440	71.6	0.000	...			
Brown-headed Cowbird	254	2766	3844	451	0.489	0.020	4.1	0.006	0.413	0.027	6.6	0.029	0.472	0.040	8.5	0.018	...			
Orchard Oriole	23	330	390	24	0.433	0.085	19.7	0.027	0.158	0.079	50.2	0.002	0.750	0.389	51.9	0.177	...			
Bullock's Oriole	51	1500	1892	130	0.442	0.037	8.4	0.011	0.333	0.049	14.6	0.018	0.355	0.060	16.8	0.001	...			
Baltimore Oriole	55	876	1076	79	0.482	0.047	9.8	0.032	0.275	0.055	20.1	0.859	0.400	0.091	22.6	0.004	.t.			
Pine Grosbeak	10	144	172	11	0.401	0.130	32.3	0.002	0.284	0.178	62.6	0.016	0.489	0.354	72.3	0.002	...			
Purple Finch	57	4029	5075	448	0.461	0.020	4.3	0.118	0.324	0.026	7.9	0.004	0.424	0.039	9.2	0.010	...			
Cassin's Finch	25	667	714	19	0.468	0.093	19.9	0.001	0.070	0.051	72.6	0.130	0.516	0.375	72.7	0.023	...			
House Finch	61	1514	1598	31	0.508	0.081	16.0	0.002	0.090	0.046	51.5	0.004	0.283	0.147	51.8	0.006	...			
Common Redpoll	14	1631	2035	18	0.385	0.098	25.4	0.003	0.026	0.018	68.7	0.006	0.780	0.489	62.8	0.000	...			
Pine Siskin	52	2652	2832	20	0.394	0.095	24.1	0.023	0.015	0.016	105.0	0.006	0.870	0.889	102.2	0.015	...			
Lesser Goldfinch	44	1625	1758	51	0.385	0.063	16.4	0.006	0.092	0.043	46.2	0.002	0.653	0.300	45.8	0.047	...			
American Goldfinch	165	8850	10720	736	0.432	0.016	3.6	0.204	0.263	0.018	7.0	0.125	0.463	0.035	7.6	0.125	...	t..		
Mean (184 species)[m]	55	1732	2590	277	0.487	0.069	15.0	0.118	0.340	0.075	33.7	0.093	0.500	0.228	37.7	0.065				
Mean (159 better-estimated sp.)[m,n]	62	1976	2964	319	0.487	0.052	10.8	0.135	0.359	0.061	22.1	0.107	0.466	0.125	26.1	0.074				
NORTHWEST MAPS REGION																				
Williamson's Sapsucker	9	93	126	9	0.292	0.121	41.5	0.002	0.348	0.218	62.5	0.028	0.679	0.453	66.6	0.003	...			
Red-naped Sapsucker	30	465	798	92	0.422	0.042	9.9	0.004	0.506	0.068	13.5	0.001	0.546	0.102	18.6	0.001	...			
R.-naped x R.-breasted Hybrid	6	62	118	16	0.537	0.110	20.4	0.012	0.399	0.136	34.0	0.027	0.648	0.280	43.2	0.023	...			
Red-breasted Sapsucker	50	868	1409	151	0.449	0.034	7.5	0.004	0.413	0.049	11.8	0.011	0.571	0.084	14.7	0.018	...			
Downy Woodpecker	46	435	547	45	0.340	0.061	18.0	0.017	0.406	0.104	25.6	0.867	0.542	0.162	29.9	0.001	.t.			
Hairy Woodpecker	60	311	392	58	0.611	0.055	9.1	0.122	0.238	0.054	22.7	0.011	0.635	0.164	25.9	0.330	...	..t		
Northern Flicker†	58	230	253	8	0.414	0.158	38.2	0.001	0.062	0.076	122.8	0.001	1.000	1.210	121.0	0.001	...			
Olive-sided Flycatcher*†	15	59	72	3	0.830	0.202	24.3	0.000	0.017	0.025	150.0	0.000	1.000	1.455	145.5	0.000	...			
Western Wood-Pewee	62	1354	1803	199	0.509	0.031	6.0	0.077	0.344	0.037	10.9	0.100	0.475	0.062	13.1	0.804	..t			
"Traill's" Flycatcher	34	1446	2171	241	0.527	0.027	5.1	0.094	0.486	0.038	7.9	0.010	0.312	0.036	11.5	0.860	..t			
Least Flycatcher	3	43	64	6	0.587	0.168	28.6	0.000	0.716	0.234	32.7	0.000	0.139	0.107	76.9	0.000	...			
Hammond's Flycatcher	55	1345	1932	219	0.442	0.027	6.2	0.194	0.412	0.041	9.9	0.020	0.512	0.063	12.3	0.001	...			

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival: Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture: Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of: Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
Dusky Flycatcher	43	2355	3561	349	0.500	0.021	4.2	0.998	0.413	0.029	7.1	0.008	0.321	0.031	9.7	0.007	t..			
"Western" Flycatcher	51	1889	2532	235	0.496	0.026	5.3	0.083	0.331	0.033	10.0	0.028	0.386	0.047	12.1	0.021	...			
Cassin's Vireo	32	573	681	40	0.566	0.064	11.3	0.002	0.151	0.049	32.5	0.007	0.422	0.144	34.0	0.007	...			
Hutton's Vireo	8	33	48	8	0.607	0.153	25.2	0.000	0.368	0.178	48.4	0.000	0.515	0.316	61.4	0.000	...			
Warbling Vireo	92	4473	6635	743	0.489	0.015	3.1	0.029	0.407	0.021	5.1	0.002	0.439	0.029	6.6	0.798	..t			
Red-eyed Vireo	7	142	214	20	0.646	0.089	13.8	0.078	0.210	0.073	34.8	0.019	0.360	0.147	40.8	0.002	...			
Gray Jay	9	51	74	19	0.727	0.080	11.1	0.002	0.222	0.078	35.2	0.002	0.799	0.310	38.9	0.000	...			
Steller's Jay	54	244	266	18	0.667	0.095	14.2	0.000	0.116	0.065	55.7	0.001	0.433	0.251	57.9	0.002	...			
Western Scrub-Jay	11	48	56	6	0.622	0.145	23.3	0.000	0.204	0.144	70.3	0.000	0.405	0.314	77.6	0.000	...			
Tree Swallow	19	468	652	50	0.424	0.058	13.7	0.004	0.283	0.073	25.8	0.002	0.645	0.184	28.5	0.003	...			
Violet-green Swallow*†	4	76	86	3	0.307	0.240	78.3	0.001	0.097	0.184	190.7	0.000	1.000	1.874	187.4	0.000	...			
N. Rough-winged Swallow*	10	78	83	3	0.525	0.261	49.6	0.000	0.460	0.360	78.1	0.000	0.095	0.102	107.3	0.000	...			
Barn Swallow	5	322	402	35	0.498	0.065	13.0	0.273	0.191	0.062	32.6	0.273	0.582	0.202	34.7	0.003	...	t..	.t.	
Black-capped Chickadee	52	1111	1611	202	0.480	0.030	6.3	0.309	0.402	0.041	10.3	0.492	0.588	0.075	12.7	0.005	...	tt.	.t.	
Mountain Chickadee	43	1189	1499	132	0.454	0.037	8.2	0.029	0.340	0.048	14.2	0.121	0.454	0.076	16.7	0.004	...			
Chestnut-backed Chickadee	45	1026	1203	82	0.333	0.048	14.5	0.002	0.203	0.060	29.4	0.048	0.959	0.297	30.9	0.002	...			
Bushtit†	13	210	251	11	0.420	0.140	33.4	0.007	0.094	0.082	87.4	0.023	1.000	0.854	85.4	0.004	...			
Red-breasted Nuthatch	67	629	705	28	0.361	0.081	22.6	0.001	0.113	0.067	58.8	0.003	0.807	0.479	59.3	0.005	...			
Brown Creeper	48	603	763	54	0.332	0.056	17.0	0.002	0.269	0.080	29.9	0.011	0.798	0.255	31.9	0.000	...			
Bewick's Wren	18	277	463	60	0.423	0.051	12.1	0.007	0.521	0.086	16.6	0.011	0.614	0.141	22.9	0.002	...			
House Wren	27	796	1154	85	0.339	0.043	12.7	0.001	0.371	0.071	19.1	0.000	0.619	0.132	21.3	0.000	...			
Winter Wren	35	1053	1721	144	0.361	0.031	8.5	0.426	0.527	0.058	11.0	0.151	0.395	0.061	15.4	0.041	...	t..	.t.	
Golden-crowned Kinglet*	56	1057	1315	14	0.111	0.072	64.7	0.006	0.322	0.243	75.4	0.004	0.260	0.138	53.3	0.013	...			
Ruby-crowned Kinglet	18	829	1061	47	0.329	0.059	17.8	0.694	0.263	0.078	29.8	0.277	0.475	0.145	30.4	0.015	t..	.t.		
Veery	6	181	404	76	0.570	0.049	8.7	0.001	0.726	0.067	9.3	0.086	0.414	0.087	21.1	0.085	...			
Swainson's Thrush	81	8784	20182	3545	0.592	0.007	1.1	0.002	0.625	0.010	1.5	0.000	0.422	0.013	3.0	0.269	...	..t		
Hermit Thrush	36	927	1430	173	0.433	0.030	6.9	0.001	0.551	0.050	9.1	0.029	0.428	0.058	13.5	0.003	...			
American Robin	130	5092	6840	761	0.544	0.015	2.8	0.998	0.258	0.016	6.2	0.002	0.588	0.041	6.9	0.013	t..			
Varied Thrush	31	436	582	52	0.453	0.054	12.0	0.171	0.385	0.078	20.3	0.766	0.346	0.088	25.4	0.001	.t.			
Wrentit	21	613	1440	241	0.550	0.025	4.6	0.895	0.638	0.038	5.9	0.143	0.428	0.054	12.6	0.103	t..			
Gray Catbird	14	841	1315	170	0.556	0.035	6.4	0.009	0.390	0.042	10.8	0.001	0.545	0.073	13.5	0.267	...	..t		
Cedar Waxwing	32	1967	2273	19	0.480	0.105	22.0	0.005	0.039	0.022	55.4	0.001	0.288	0.148	51.5	0.028	...			
Orange-crowned Warbler	38	1617	2272	229	0.449	0.027	6.1	0.020	0.470	0.042	8.9	0.020	0.382	0.046	11.9	0.007	...			
Nashville Warbler	21	829	1009	50	0.332	0.056	16.7	0.004	0.428	0.099	23.2	0.007	0.279	0.076	27.3	0.018	...			

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival: Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture: Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of: Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
Virginia's Warbler†	2	265	300	20	0.407	0.104	25.5	0.005	0.157	0.103	65.3	0.584	1.000	0.685	68.5	0.001	.t.	...		
Yellow Warbler	64	6225	10298	1388	0.561	0.011	2.0	0.402	0.496	0.016	3.2	0.028	0.389	0.018	4.7	0.761	..t	t..	t.t	
Yellow-rumped Warbler	62	3689	4415	299	0.482	0.025	5.2	0.041	0.208	0.024	11.6	0.786	0.484	0.060	12.3	0.003	.t.			
Black-throated Gray Warbler	18	143	165	5	0.454	0.189	41.6	0.007	0.077	0.087	112.2	0.002	0.612	0.665	108.7	0.001	...			
Townsend's Warbler	25	1032	1283	101	0.457	0.042	9.2	0.002	0.198	0.042	21.4	0.003	0.689	0.155	22.5	0.003	...			
Hermit Warbler	32	1275	1399	43	0.597	0.063	10.6	0.018	0.099	0.033	33.7	0.004	0.271	0.093	34.4	0.004	...			
American Redstart	7	366	629	65	0.452	0.048	10.6	0.006	0.519	0.078	14.9	0.116	0.357	0.081	22.7	0.026	...			
Northern Waterthrush	7	177	262	29	0.621	0.083	13.4	0.909	0.443	0.098	22.2	0.012	0.205	0.070	34.3	0.007	t..			
MacGillivray's Warbler	91	7258	14191	1776	0.485	0.010	2.0	0.898	0.601	0.015	2.5	0.005	0.409	0.017	4.2	0.076	t..			
Common Yellowthroat	31	2000	3831	480	0.501	0.018	3.6	0.004	0.543	0.028	5.1	0.004	0.395	0.033	8.3	0.076	...			
Wilson's Warbler	57	4386	6951	679	0.428	0.015	3.5	0.023	0.535	0.025	4.7	0.002	0.345	0.024	7.0	0.715	..t	...		
Yellow-breasted Chat	18	1092	2033	278	0.505	0.023	4.6	0.895	0.520	0.036	6.9	0.071	0.423	0.047	11.1	0.174	t..			
Western Tanager	76	1842	2022	108	0.516	0.043	8.4	0.000	0.121	0.033	27.0	0.004	0.594	0.167	28.1	0.000	...			
Green-tailed Towhee	12	350	546	77	0.657	0.050	7.6	0.002	0.305	0.051	16.6	0.002	0.503	0.099	19.8	0.003	...			
Spotted Towhee	52	1436	2181	286	0.492	0.025	5.1	0.822	0.451	0.036	7.9	0.040	0.522	0.054	10.4	0.009	t..			
Chipping Sparrow	40	1027	1276	84	0.432	0.046	10.6	0.010	0.201	0.047	23.4	0.016	0.626	0.154	24.5	0.116	...			
Vesper Sparrow	3	56	73	11	0.754	0.110	14.6	0.000	0.265	0.114	43.1	0.002	0.328	0.170	51.7	0.000	...			
Savannah Sparrow	4	421	591	100	0.621	0.049	7.9	0.011	0.333	0.050	14.9	0.004	0.585	0.107	18.2	0.001	...			
Fox Sparrow	27	662	1152	136	0.535	0.035	6.6	0.566	0.437	0.048	10.9	0.071	0.395	0.061	15.4	0.089	t..	...		
Song Sparrow	109	7478	15446	2036	0.477	0.009	1.8	0.928	0.579	0.014	2.4	0.859	0.500	0.020	4.0	0.001	tt.			
Lincoln's Sparrow	37	2428	5701	744	0.433	0.014	3.3	0.333	0.610	0.024	4.0	0.016	0.641	0.042	6.5	0.121	...	t..		
White-crowned Sparrow	15	704	1215	167	0.463	0.030	6.6	0.007	0.534	0.048	9.1	0.002	0.495	0.068	13.7	0.007	...			
Dark-eyed Junco	88	6308	10836	1396	0.453	0.011	2.4	0.996	0.502	0.017	3.4	0.006	0.525	0.025	4.7	0.018	t..			
Black-headed Grosbeak	75	2622	3416	371	0.554	0.022	3.9	0.003	0.263	0.023	8.8	0.002	0.512	0.051	10.0	0.011	...			
Lazuli Bunting	31	1479	1901	143	0.517	0.035	6.7	0.001	0.263	0.037	13.9	0.001	0.359	0.056	15.7	0.076	...			
Red-winged Blackbird	28	1064	1192	77	0.676	0.059	8.7	0.068	0.139	0.035	24.9	0.068	0.372	0.094	25.2	0.042	...			
Brown-headed Cowbird	72	999	1479	196	0.485	0.030	6.2	0.004	0.457	0.044	9.6	0.047	0.514	0.065	12.6	0.007	...			
Bullock's Oriole	24	841	1086	96	0.462	0.044	9.5	0.007	0.391	0.061	15.6	0.011	0.387	0.074	19.1	0.001	...			
Pine Grosbeak*†	3	57	63	3	0.325	0.251	77.2	0.000	0.131	0.269	204.8	0.000	1.000	2.157	215.7	0.000	...			
Purple Finch	36	2795	3473	287	0.437	0.025	5.6	0.011	0.334	0.033	10.0	0.020	0.414	0.048	11.6	0.005	...			
Cassin's Finch	22	548	584	14	0.524	0.109	20.9	0.001	0.078	0.058	73.6	0.105	0.330	0.243	73.6	0.007	...			
House Finch†	5	328	368	15	0.436	0.109	24.9	0.028	0.070	0.066	93.3	0.017	1.000	0.940	94.0	0.003	...			
Pine Siskin	45	2529	2704	20	0.268	0.093	34.7	0.046	0.027	0.029	107.1	0.011	0.828	0.847	102.2	0.029	...			
Lesser Goldfinch†	7	343	369	9	0.389	0.153	39.4	0.000	0.056	0.075	134.4	0.000	1.000	1.323	132.3	0.001	...			

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival: Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture: Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of: Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
American Goldfinch	22	1855	2485	227	0.476	0.027	5.7	0.380	0.326	0.034	10.6	0.988	0.440	0.054	12.4	0.012	.t.	tt.		
Mean (81 species)[m]	35	1403	2227	253	0.485	0.067	15.3	0.161	0.333	0.070	35.0	0.093	0.531	0.251	38.3	0.076				
Mean (68 better-estimated sp.)[m,n]	38	1590	2562	300	0.501	0.049	9.7	0.190	0.369	0.056	19.9	0.101	0.478	0.112	23.8	0.090				
SOUTHWEST MAPS REGION																				
Common Ground-Dove*†	3	81	93	2	0.697	0.698	100.1	0.000	0.024	0.058	248.3	0.000	1.000	2.126	212.6	0.000	...			
Acorn Woodpecker	8	58	72	8	0.464	0.177	38.1	0.000	0.726	0.230	31.6	0.000	0.279	0.174	62.4	0.000	...			
Williamson's Sapsucker	5	96	122	8	0.469	0.142	30.3	0.001	0.208	0.136	65.4	0.004	0.456	0.312	68.5	0.000	...			
Red-naped Sapsucker	4	149	292	63	0.576	0.050	8.8	0.002	0.583	0.072	12.3	0.018	0.526	0.116	22.1	0.002	...			
Red-breasted Sapsucker	2	30	39	5	0.688	0.178	25.9	0.000	0.454	0.220	48.4	0.000	0.261	0.192	73.5	0.000	...			
Ladder-backed Woodpecker*†	9	48	63	7	0.512	0.205	40.0	0.000	0.222	0.185	83.5	0.000	1.000	0.899	89.9	0.000	...			
Nuttall's Woodpecker	26	319	483	69	0.596	0.052	8.7	0.000	0.374	0.061	16.4	0.001	0.476	0.099	20.9	0.029	...			
Downy Woodpecker	27	332	507	65	0.623	0.052	8.3	0.000	0.373	0.061	16.3	0.003	0.355	0.077	21.7	0.003	...			
Hairy Woodpecker	11	102	144	19	0.794	0.082	10.3	0.001	0.184	0.062	34.0	0.017	0.357	0.143	40.1	0.001	...			
Northern Flicker	25	175	206	15	0.412	0.113	27.4	0.011	0.153	0.105	68.6	0.040	0.909	0.659	72.5	0.009	...			
Olive-sided Flycatcher	2	59	85	14	0.832	0.083	10.0	0.000	0.706	0.121	17.2	0.001	0.025	0.025	99.9	0.000	...			
Western Wood-Pewee	18	332	445	45	0.516	0.061	11.8	0.006	0.286	0.070	24.5	0.004	0.564	0.158	28.0	0.075	...			
"Traill's" Flycatcher	5	63	75	6	0.483	0.196	40.5	0.000	0.328	0.237	72.3	0.000	0.427	0.333	78.1	0.000	...			
Dusky Flycatcher	7	172	197	9	0.428	0.154	36.0	0.001	0.701	0.236	33.7	0.003	0.108	0.065	60.2	0.001	...			
"Western" Flycatcher	24	1320	1527	72	0.520	0.051	9.8	0.258	0.308	0.058	18.9	0.980	0.177	0.040	22.5	0.040	.t.	tt.		
Black Phoebe	23	208	249	20	0.545	0.096	17.6	0.001	0.323	0.112	34.5	0.003	0.282	0.116	41.0	0.000	...			
Vermilion Flycatcher*†	3	56	67	7	0.476	0.205	43.0	0.000	0.199	0.193	96.8	0.000	1.000	1.079	107.9	0.000	...			
Ash-throated Flycatcher	48	1089	1268	107	0.644	0.045	7.0	0.003	0.206	0.038	18.6	0.002	0.391	0.079	20.3	0.269	...	..t		
Brown-crested Flycatcher*	5	42	49	4	0.621	0.241	38.8	0.000	0.614	0.309	50.3	0.000	0.163	0.140	86.0	0.000	...			
Bell's Vireo	6	163	269	35	0.574	0.072	12.5	0.001	0.473	0.097	20.6	0.000	0.415	0.122	29.5	0.003	...			
Plumbeous Vireo	7	62	96	19	0.621	0.104	16.8	0.001	0.432	0.127	29.5	0.000	0.603	0.232	38.5	0.000	...			
Hutton's Vireo	12	100	137	12	0.560	0.125	22.4	0.001	0.242	0.117	48.5	0.054	0.424	0.231	54.4	0.005	...			
Warbling Vireo	18	1507	1876	114	0.526	0.039	7.3	0.001	0.458	0.054	11.8	0.004	0.144	0.024	16.8	1.000	..t			
Steller's Jay	9	121	163	27	0.738	0.067	9.0	0.001	0.189	0.058	30.5	0.817	0.586	0.197	33.6	0.000	.t.			
Western Scrub-Jay†	23	113	129	10	0.494	0.143	28.9	0.003	0.114	0.107	93.3	0.001	1.000	0.960	96.0	0.010	...			
Mexican Jay*	3	38	46	3	0.366	0.223	60.9	0.000	0.289	0.312	108.0	0.000	0.486	0.560	115.1	0.000	...			
Tree Swallow	11	104	123	6	0.520	0.159	30.7	0.005	0.286	0.182	63.7	0.002	0.150	0.114	76.0	0.006	...			
Violet-green Swallow	5	113	152	13	0.500	0.110	22.0	0.002	0.247	0.117	47.2	0.973	0.416	0.218	52.5	0.000	.t.			

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival: Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture: Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of: Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
Black-capped Chickadee	5	105	175	21	0.400	0.087	21.8	0.001	0.574	0.150	26.1	0.000	0.676	0.261	38.6	0.000	...			
Mountain Chickadee	10	295	389	36	0.381	0.066	17.5	0.451	0.292	0.092	31.6	0.451	0.798	0.275	34.4	0.001	t..	.t.		
Chestnut-backed Chickadee	7	349	598	92	0.494	0.044	8.9	0.087	0.477	0.063	13.3	0.885	0.633	0.114	18.0	0.000	.t.			
Bridled Titmouse	6	40	56	10	0.642	0.161	25.2	0.000	0.256	0.143	55.9	0.000	0.845	0.498	58.9	0.000	...			
Oak Titmouse	19	272	412	50	0.530	0.058	11.0	0.000	0.395	0.076	19.3	0.001	0.435	0.110	25.3	0.018	...			
Juniper Titmouse	4	51	93	19	0.586	0.095	16.3	0.000	0.482	0.130	26.8	0.000	0.630	0.243	38.5	0.000	...			
Verdin*†	3	42	55	2	0.422	0.334	79.3	0.000	0.092	0.186	200.7	0.000	1.000	1.910	191.0	0.000	...			
Bushtit	44	1735	2069	111	0.358	0.042	11.8	0.884	0.237	0.050	21.2	0.239	0.588	0.129	21.9	0.302	t..	tt.	t.t	
White-breasted Nuthatch	20	155	200	20	0.459	0.103	22.4	0.060	0.384	0.139	36.1	0.007	0.507	0.221	43.5	0.054	...			
Brown Creeper*	7	188	229	5	0.231	0.170	73.6	0.054	0.191	0.227	119.0	0.013	0.614	0.669	109.0	0.005	...			
Bewick's Wren	55	1630	2738	336	0.438	0.023	5.2	0.796	0.559	0.037	6.6	0.032	0.532	0.051	9.6	0.715	t.t	t..		
House Wren	34	1358	1974	144	0.384	0.034	8.7	0.003	0.401	0.053	13.2	0.003	0.457	0.071	15.5	0.001	...			
Golden-crowned Kinglet*	5	49	70	4	0.312	0.194	62.1	0.000	0.315	0.320	101.5	0.000	0.695	0.755	108.6	0.000	...			
Blue-gray Gnatcatcher*†	11	117	142	4	0.254	0.205	80.8	0.001	0.123	0.217	176.6	0.001	1.000	1.739	173.9	0.000	...			
Western Bluebird	12	113	154	9	0.318	0.119	37.3	0.000	0.409	0.221	54.1	0.004	0.419	0.264	63.0	0.002	...			
Swainson's Thrush	10	2354	4226	437	0.588	0.020	3.3	0.791	0.612	0.027	4.5	0.061	0.171	0.015	9.0	1.000	t.t			
Hermit Thrush	7	494	767	123	0.477	0.038	8.0	0.115	0.403	0.053	13.2	0.043	0.828	0.135	16.4	0.001	...			
American Robin	30	785	1008	114	0.490	0.040	8.2	0.585	0.265	0.046	17.3	0.053	0.685	0.132	19.2	0.362	t..	..t		
Wrentit	25	1619	3081	481	0.618	0.019	3.1	0.431	0.494	0.025	5.1	0.377	0.408	0.033	8.1	0.654	..t	tt.		
California Thrasher†	15	134	173	21	0.690	0.108	15.7	0.007	0.121	0.061	50.0	0.005	1.000	0.498	49.8	0.000	...			
Orange-crowned Warbler	22	1651	2072	130	0.422	0.038	8.9	0.149	0.346	0.052	14.9	0.055	0.352	0.061	17.4	0.149	...			
Virginia's Warbler	11	344	444	32	0.451	0.069	15.3	0.007	0.388	0.101	25.9	0.396	0.281	0.092	32.6	0.007	...	.t.		
Lucy's Warbler	8	401	505	48	0.466	0.065	13.9	0.004	0.317	0.080	25.1	0.000	0.567	0.160	28.3	0.002	...			
Yellow Warbler	19	1009	1378	127	0.513	0.037	7.2	0.813	0.412	0.050	12.2	0.005	0.305	0.049	15.9	0.211	t..			
Yellow-rumped Warbler†	6	360	417	22	0.392	0.091	23.3	0.592	0.124	0.083	66.5	0.105	1.000	0.689	68.9	0.254	t..	..t		
Black-throated Gray Warbler*†	2	31	35	2	0.447	0.351	78.6	0.000	0.091	0.192	212.4	0.000	1.000	2.050	205.0	0.000	...			
MacGillivray's Warbler	8	173	211	11	0.369	0.121	32.7	0.003	0.334	0.179	53.5	0.032	0.334	0.196	58.7	0.005	...			
Common Yellowthroat	32	2445	3821	388	0.512	0.023	4.4	0.943	0.435	0.030	7.0	0.002	0.393	0.036	9.1	0.030	t..			
Wilson's Warbler	12	3554	4571	249	0.441	0.025	5.7	0.011	0.460	0.039	8.5	0.942	0.178	0.021	11.6	1.000	.tt			
Yellow-breasted Chat	18	1020	1783	248	0.518	0.028	5.3	0.136	0.497	0.039	7.8	0.050	0.509	0.056	11.1	0.015	...			
Summer Tanager	9	236	392	69	0.562	0.058	10.3	0.076	0.435	0.070	16.1	0.002	0.763	0.156	20.4	0.001	...			
Western Tanager	11	449	501	26	0.537	0.080	14.9	0.002	0.185	0.073	39.7	0.003	0.325	0.140	43.1	0.000	...			
Spotted Towhee	48	2038	3015	421	0.504	0.021	4.2	0.024	0.425	0.029	6.8	0.170	0.585	0.050	8.6	0.063	...			
California Towhee	31	704	979	140	0.563	0.037	6.6	0.004	0.332	0.043	12.9	0.007	0.596	0.091	15.2	0.923	..t			

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival: Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture: Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of: Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
Abert's Towhee	5	131	173	16	0.486	0.126	25.9	0.000	0.390	0.157	40.3	0.000	0.389	0.189	48.7	0.001	...			
Rufous-crowned Sparrow	12	179	263	26	0.581	0.090	15.6	0.002	0.254	0.084	32.9	0.005	0.513	0.183	35.7	0.000	...			
Chipping Sparrow†	7	145	166	10	0.493	0.134	27.3	0.001	0.087	0.088	100.3	0.001	1.000	1.025	102.5	0.001	...			
Lark Sparrow	8	304	332	17	0.427	0.102	23.9	0.009	0.342	0.143	41.8	0.007	0.229	0.112	48.9	0.004	...			
Black-throated Sparrow*	10	136	145	4	0.593	0.220	37.1	0.000	0.114	0.120	105.1	0.001	0.217	0.236	108.8	0.002	...			
Sage Sparrow*†	2	99	104	3	0.496	0.277	55.8	0.001	0.037	0.093	254.1	0.000	1.000	2.485	248.5	0.000	...			
Fox Sparrow	2	84	140	19	0.531	0.082	15.5	0.000	0.548	0.128	23.4	0.000	0.327	0.144	44.0	0.000	...			
Song Sparrow	36	3195	5377	759	0.537	0.016	2.9	0.887	0.474	0.022	4.5	0.275	0.477	0.030	6.3	0.283	t..	t.t	tt.	
Lincoln's Sparrow	2	110	380	35	0.437	0.057	13.0	0.000	0.876	0.080	9.1	0.000	0.176	0.101	57.3	0.000	...			
White-crowned Sparrow	3	63	83	8	0.668	0.118	17.6	0.000	0.162	0.098	60.3	0.000	0.483	0.317	65.6	0.000	...			
Dark-eyed Junco	8	428	650	69	0.356	0.047	13.2	0.002	0.532	0.088	16.6	1.000	0.621	0.137	22.1	0.001	.t.			
Northern Cardinal	2	47	73	8	0.394	0.151	38.5	0.000	0.637	0.272	42.7	0.000	0.460	0.290	63.0	0.000	...			
Black-headed Grosbeak	43	2133	2681	258	0.517	0.026	5.1	0.084	0.338	0.032	9.6	0.019	0.357	0.041	11.5	0.923	..t			
Blue Grosbeak	21	324	391	33	0.467	0.083	17.8	0.002	0.311	0.100	32.0	0.000	0.505	0.186	36.9	0.002	...			
Lazuli Bunting	20	629	756	36	0.372	0.063	17.0	0.168	0.418	0.108	25.8	0.557	0.200	0.063	31.5	0.015	.t.	...		
Varied Bunting*†	2	69	80	5	0.365	0.282	77.4	0.000	0.208	0.315	151.6	0.000	1.000	1.630	163.0	0.000	...			
Red-winged Blackbird†	13	326	359	17	0.714	0.150	21.0	0.005	0.035	0.032	90.4	0.004	1.000	0.869	86.9	0.005	...			
Brown-headed Cowbird	39	452	678	93	0.530	0.045	8.6	0.002	0.462	0.061	13.3	0.004	0.454	0.082	18.1	0.001	...			
Bullock's Oriole	25	568	698	30	0.391	0.075	19.2	0.001	0.280	0.094	33.6	0.000	0.294	0.105	35.7	0.000	...			
Purple Finch	9	1082	1411	145	0.522	0.036	6.8	0.347	0.307	0.041	13.3	0.571	0.430	0.067	15.6	0.016	.t.	t..		
Cassin's Finch*†	3	119	130	5	0.318	0.171	53.8	0.000	0.098	0.157	159.3	0.000	1.000	1.621	162.1	0.000	...			
House Finch	40	994	1027	14	0.660	0.144	21.8	0.028	0.136	0.078	57.4	0.010	0.085	0.052	61.7	0.066	...			
Lesser Goldfinch	36	1270	1377	42	0.389	0.069	17.8	0.012	0.113	0.052	46.2	0.001	0.532	0.246	46.1	0.373	...	..t		
American Goldfinch	19	961	1061	43	0.495	0.071	14.4	0.002	0.139	0.051	36.4	0.015	0.403	0.151	37.3	0.011	...			
Mean (86 species)	15	549	770	75	0.504	0.111	23.7	0.103	0.336	0.112	50.5	0.109	0.526	0.370	56.9	0.104				
Mean (59 better-estimated sp.)[n]	19	749	1062	106	0.525	0.067	12.9	0.139	0.375	0.079	24.8	0.155	0.448	0.138	31.9	0.146				
NORTH-CENTRAL MAPS REGION																				
Red-bellied Woodpecker	10	54	60	5	0.424	0.187	44.1	0.000	0.273	0.248	90.9	0.000	0.607	0.624	102.9	0.000	...			
Downy Woodpecker†	26	354	460	45	0.382	0.062	16.3	0.000	0.251	0.081	32.1	0.001	1.000	0.347	34.7	0.001	...			
Hairy Woodpecker	18	79	91	10	0.427	0.144	33.8	0.012	0.769	0.201	26.1	0.000	0.229	0.128	55.9	0.000	...			
Northern Flicker*	20	89	111	4	0.321	0.185	57.7	0.001	0.313	0.277	88.5	0.001	0.236	0.227	95.9	0.000	...			
Western Wood-Pewee†	2	89	153	25	0.445	0.083	18.7	0.166	0.392	0.119	30.4	0.675	1.000	0.362	36.2	0.001	.t.			

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival: Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture: Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of: Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
Eastern Wood-Pewee	16	179	216	12	0.478	0.117	24.6	0.018	0.309	0.142	46.1	0.026	0.226	0.122	54.0	0.004	...			
"Traill's" Flycatcher	14	795	1208	115	0.476	0.037	7.8	0.007	0.495	0.057	11.5	0.029	0.341	0.056	16.6	0.018	...			
Least Flycatcher	15	1099	1526	139	0.397	0.035	8.8	0.002	0.448	0.056	12.5	0.880	0.438	0.069	15.7	0.001	.t.			
Great Crested Flycatcher	17	114	136	19	0.840	0.079	9.4	0.000	0.234	0.074	31.5	0.001	0.234	0.088	37.7	0.000	...			
White-eyed Vireo	2	32	74	11	0.509	0.104	20.4	0.000	0.578	0.172	29.7	0.000	0.334	0.238	71.2	0.000	...			
Warbling Vireo	9	126	138	8	0.505	0.150	29.8	0.005	0.275	0.174	63.3	0.039	0.243	0.181	74.3	0.001	...			
Red-eyed Vireo	26	761	1010	98	0.542	0.041	7.5	0.071	0.401	0.054	13.5	0.900	0.306	0.055	18.0	0.291	.t.	.tt		
Blue Jay†	23	215	239	17	0.524	0.101	19.4	0.004	0.087	0.068	78.2	0.005	1.000	0.805	80.5	0.001	...			
Black-capped Chickadee	33	872	1152	107	0.413	0.040	9.6	0.002	0.461	0.063	13.7	0.004	0.418	0.074	17.8	0.011	...			
Tufted Titmouse	11	201	282	45	0.524	0.062	11.8	0.003	0.456	0.087	19.0	0.001	0.498	0.129	25.9	0.007	...			
White-breasted Nuthatch	17	89	102	6	0.537	0.163	30.4	0.000	0.187	0.141	75.4	0.001	0.312	0.251	80.6	0.000	...			
Carolina Wren	7	91	135	15	0.339	0.090	26.5	0.231	0.651	0.186	28.5	0.040	0.418	0.197	47.1	0.000	...			
House Wren	22	1065	1610	113	0.298	0.033	11.2	0.632	0.459	0.068	14.9	0.088	0.516	0.091	17.7	0.239	t..	..t		
Veery	12	476	836	153	0.602	0.034	5.6	0.002	0.555	0.045	8.1	0.029	0.489	0.065	13.2	0.002	...			
Wood Thrush	13	366	578	64	0.417	0.052	12.5	0.001	0.402	0.078	19.3	0.002	0.731	0.167	22.9	0.007	...			
American Robin	31	978	1192	72	0.420	0.049	11.5	0.104	0.395	0.071	18.0	0.103	0.254	0.057	22.2	0.039	...			
Gray Catbird	28	2859	4737	573	0.503	0.017	3.4	0.087	0.474	0.025	5.2	0.808	0.438	0.032	7.4	0.137	.t.			
Brown Thrasher	6	107	142	20	0.672	0.086	12.8	0.000	0.187	0.073	38.8	0.002	0.652	0.280	42.9	0.060	...			
Blue-winged Warbler	5	166	295	30	0.620	0.074	12.0	0.002	0.327	0.081	24.9	0.029	0.366	0.119	32.4	0.007	...			
Nashville Warbler	4	208	240	9	0.401	0.129	32.3	0.003	0.352	0.193	54.9	0.001	0.210	0.138	65.5	0.004	...			
Yellow Warbler	20	1720	2728	374	0.549	0.021	3.9	0.000	0.402	0.028	6.9	0.001	0.484	0.044	9.0	0.003	...			
Chestnut-sided Warbler	5	413	720	84	0.385	0.042	11.0	0.047	0.614	0.076	12.3	0.006	0.621	0.120	19.3	0.004	...			
Yellow-rumped Warbler*†	1	37	45	2	0.374	0.277	74.1	0.000	0.102	0.242	238.3	0.000	1.000	2.453	245.3	0.000	...			
Black-and-white Warbler	7	131	170	19	0.485	0.091	18.8	0.031	0.543	0.141	26.0	0.003	0.237	0.097	41.1	0.001	...			
American Redstart	13	722	1020	70	0.441	0.048	10.8	0.001	0.312	0.061	19.4	0.075	0.412	0.093	22.5	0.017	...			
Ovenbird	10	462	609	61	0.577	0.053	9.2	0.195	0.339	0.063	18.6	0.067	0.345	0.080	23.2	0.331	...	..t	t..	
Northern Waterthrush†	2	65	84	7	0.314	0.147	46.7	0.000	0.270	0.228	84.6	0.000	1.000	0.912	91.2	0.000	...			
Kentucky Warbler	2	104	204	46	0.604	0.062	10.3	0.007	0.584	0.083	14.3	0.007	0.599	0.141	23.6	0.018	...			
Mourning Warbler	3	136	249	37	0.460	0.068	14.8	0.031	0.585	0.106	18.1	0.006	0.638	0.180	28.1	0.001	...			
Common Yellowthroat	30	1887	3303	324	0.451	0.022	5.0	0.030	0.520	0.036	6.8	0.048	0.407	0.041	10.0	0.994	..t			
Scarlet Tanager*	12	75	84	4	0.341	0.197	57.8	0.000	0.387	0.345	89.1	0.000	0.269	0.288	107.3	0.000	...			
Eastern Towhee	10	73	110	12	0.408	0.119	29.2	0.027	0.579	0.202	34.9	0.029	0.460	0.237	51.6	0.001	...			
Chipping Sparrow†	10	189	236	13	0.380	0.110	28.9	0.005	0.134	0.098	72.8	0.026	1.000	0.733	73.3	0.001	...			
Clay-colored Sparrow	7	365	446	21	0.465	0.101	21.7	0.011	0.340	0.120	35.4	0.041	0.209	0.087	41.6	0.004	...			

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival: Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture: Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of: Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
Field Sparrow	11	716	1060	112	0.430	0.038	8.8	0.016	0.331	0.051	15.4	0.073	0.663	0.116	17.6	0.027	...			
Savannah Sparrow*	3	39	49	3	0.466	0.203	43.6	0.000	0.460	0.326	70.9	0.000	0.113	0.130	115.1	0.000	...			
Song Sparrow	29	1417	2372	269	0.441	0.024	5.4	0.143	0.512	0.039	7.6	0.626	0.482	0.052	10.9	0.007	.t.	...		
Lincoln's Sparrow	2	48	90	10	0.426	0.115	26.9	0.000	0.786	0.183	23.3	0.000	0.233	0.146	62.8	0.000	...			
Swamp Sparrow	7	248	454	42	0.411	0.056	13.5	0.001	0.774	0.095	12.3	0.000	0.213	0.067	31.4	0.002	...			
White-throated Sparrow	3	320	647	60	0.380	0.045	11.8	0.058	0.623	0.087	13.9	0.026	0.496	0.119	23.9	0.005	...			
Northern Cardinal	22	736	984	118	0.499	0.038	7.6	0.002	0.366	0.050	13.7	0.007	0.498	0.084	16.8	0.011	...			
Rose-breasted Grosbeak	22	400	463	24	0.341	0.089	26.0	0.007	0.249	0.120	48.0	0.541	0.548	0.285	52.0	0.013	.t.	...		
Black-headed Grosbeak	1	69	94	7	0.454	0.169	37.1	0.006	0.221	0.165	74.6	0.000	0.673	0.525	78.0	0.001	...			
Indigo Bunting	21	972	1319	130	0.481	0.036	7.5	0.628	0.303	0.044	14.4	0.232	0.507	0.083	16.4	0.007	t..	.t.		
Red-winged Blackbird†	14	514	547	13	0.454	0.124	27.4	0.002	0.038	0.052	137.5	0.001	1.000	1.387	138.7	0.001	...			
Brown-headed Cowbird	26	296	402	40	0.488	0.064	13.1	0.007	0.412	0.090	21.9	0.003	0.351	0.100	28.5	0.029	...			
Bullock's Oriole*	1	58	75	4	0.605	0.208	34.4	0.000	0.057	0.064	112.7	0.000	0.936	1.043	111.5	0.000	...			
Baltimore Oriole	17	367	449	43	0.554	0.065	11.7	0.009	0.175	0.057	32.2	0.810	0.644	0.222	34.4	0.001	.t.			
American Goldfinch	26	2198	2764	226	0.358	0.028	7.7	0.621	0.326	0.041	12.6	0.026	0.646	0.090	13.9	0.390	t..	..t		
Mean (54 species)	13	486	713	72	0.464	0.089	20.4	0.060	0.390	0.113	40.1	0.117	0.503	0.275	48.7	0.050				
Mean (38 better-estimated sp.)[n]	15	632	943	98	0.479	0.061	13.2	0.080	0.442	0.086	21.2	0.148	0.437	0.119	29.4	0.071				
SOUTH-CENTRAL MAPS REGION																				
Common Ground-Dove	7	398	443	10	0.433	0.160	36.9	0.001	0.048	0.052	109.6	0.001	0.936	0.969	103.6	0.001	...			
Yellow-billed Cuckoo	52	492	534	17	0.505	0.101	20.0	0.022	0.196	0.096	49.1	0.107	0.207	0.111	53.6	0.003	...			
Golden-fronted Woodpecker*†	7	145	180	8	0.179	0.115	64.4	0.012	0.343	0.301	87.8	0.002	1.000	0.886	88.6	0.001	...			
Red-bellied Woodpecker	19	116	127	5	0.535	0.179	33.4	0.002	0.100	0.107	106.5	0.003	0.407	0.434	106.6	0.000	...			
Ladder-backed Woodpecker	13	99	130	20	0.642	0.099	15.4	0.000	0.361	0.111	30.6	0.001	0.420	0.165	39.3	0.001	...			
Downy Woodpecker	34	370	457	49	0.585	0.058	9.8	0.018	0.254	0.060	23.7	0.018	0.444	0.120	27.1	0.004	...			
Eastern Wood-Pewee	18	151	172	12	0.702	0.130	18.5	0.002	0.344	0.135	39.1	0.001	0.151	0.078	51.7	0.002	...			
Acadian Flycatcher	13	844	1255	180	0.502	0.031	6.1	0.001	0.546	0.046	8.4	0.003	0.399	0.052	13.0	0.004	...			
Great Crested Flycatcher	22	163	192	18	0.529	0.098	18.6	0.094	0.185	0.098	53.1	0.283	0.606	0.352	58.0	0.024	...	.t.		
Brown-crested Flycatcher	4	252	326	43	0.478	0.068	14.3	0.002	0.264	0.085	32.1	0.008	0.897	0.334	37.2	0.001	...			
Eastern Kingbird*	11	70	76	2	0.733	0.247	33.7	0.000	0.218	0.223	102.5	0.000	0.050	0.064	127.1	0.000	...			
White-eyed Vireo	31	2024	3548	461	0.539	0.019	3.5	0.015	0.513	0.027	5.3	0.078	0.386	0.032	8.3	0.056	...			
Bell's Vireo	12	487	748	106	0.564	0.038	6.7	0.008	0.380	0.049	13.0	0.994	0.464	0.078	16.9	0.005	.t.			
Red-eyed Vireo	21	468	559	56	0.554	0.056	10.1	0.003	0.166	0.048	29.1	0.011	0.758	0.234	30.8	0.011	...			

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival: Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture: Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of: Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
Green Jay*†	3	28	32	3	0.940	0.268	28.5	0.000	0.034	0.083	247.9	0.000	1.000	2.428	242.8	0.000	...			
Carolina Chickadee	44	752	864	43	0.489	0.063	12.9	0.004	0.122	0.045	36.9	0.075	0.593	0.221	37.3	0.002	...			
Black-capped Chickadee	6	138	169	12	0.407	0.117	28.7	0.229	0.232	0.138	59.5	0.023	0.557	0.348	62.5	0.062	...			
Tufted Titmouse	29	591	786	101	0.430	0.043	10.1	0.543	0.348	0.060	17.3	0.010	0.793	0.161	20.3	0.124	t..	...		
Black-crested Titmouse	19	312	407	45	0.498	0.063	12.6	0.004	0.214	0.062	29.0	0.002	0.821	0.253	30.8	0.007	...			
Verdin*	2	29	33	3	0.658	0.283	43.0	0.000	0.211	0.225	106.7	0.000	0.298	0.324	108.7	0.000	...			
Carolina Wren	37	1406	2395	310	0.407	0.022	5.3	0.764	0.624	0.038	6.2	0.152	0.495	0.050	10.2	0.088	t..			
Bewick's Wren	22	578	870	107	0.406	0.038	9.3	0.491	0.582	0.066	11.4	0.966	0.479	0.083	17.2	0.500	tt.	.tt		
House Wren	5	162	207	18	0.350	0.092	26.3	0.000	0.569	0.177	31.1	0.001	0.369	0.162	43.9	0.004	...			
Blue-gray Gnatcatcher	32	333	360	12	0.597	0.120	20.1	0.009	0.088	0.065	73.8	0.041	0.350	0.260	74.3	0.002	...			
Wood Thrush†	8	137	200	19	0.325	0.089	27.3	0.001	0.328	0.146	44.4	0.005	1.000	0.483	48.3	0.000	...			
Gray Catbird	8	795	1185	168	0.559	0.031	5.5	0.010	0.466	0.043	9.3	0.982	0.373	0.050	13.3	0.815	.tt			
Northern Mockingbird	18	377	469	16	0.316	0.092	29.3	0.024	0.223	0.116	52.0	0.009	0.392	0.203	51.9	0.031	...			
Brown Thrasher	15	312	394	31	0.377	0.071	18.8	0.014	0.553	0.127	23.0	0.054	0.300	0.100	33.3	0.005	...			
Long-billed Thrasher	4	176	237	34	0.582	0.083	14.2	0.004	0.381	0.097	25.3	0.141	0.626	0.204	32.6	0.000	...			
Blue-winged Warbler	4	280	420	61	0.549	0.053	9.6	0.002	0.519	0.075	14.4	0.002	0.328	0.074	22.4	0.000	...			
Northern Parula*†	10	61	67	3	0.315	0.240	76.3	0.000	0.127	0.230	181.1	0.000	1.000	1.811	181.1	0.000	...			
Yellow Warbler	3	108	156	28	0.502	0.079	15.6	0.003	0.375	0.107	28.5	0.029	0.754	0.264	35.0	0.002	...			
Prairie Warbler	3	155	204	22	0.550	0.097	17.6	0.220	0.193	0.078	40.4	0.085	0.737	0.324	44.0	0.001	...			
Black-and-white Warbler	13	214	239	12	0.607	0.119	19.6	0.004	0.232	0.113	48.6	0.004	0.187	0.103	55.1	0.083	...			
American Redstart	1	73	91	10	0.582	0.127	21.8	0.000	0.258	0.133	51.4	0.000	0.440	0.254	57.8	0.000	...			
Prothonotary Warbler	8	313	413	27	0.415	0.081	19.5	0.005	0.193	0.080	41.2	0.001	0.766	0.317	41.5	0.021	...			
Worm-eating Warbler	2	80	103	9	0.535	0.133	24.8	0.001	0.497	0.192	38.6	0.001	0.177	0.107	60.3	0.001	...			
Swainson's Warbler	3	79	153	15	0.405	0.107	26.4	0.006	0.551	0.181	32.8	0.045	0.586	0.271	46.2	0.001	...			
Ovenbird	5	88	124	17	0.593	0.094	15.8	0.000	0.360	0.117	32.4	0.001	0.365	0.157	42.9	0.000	...			
Louisiana Waterthrush	5	86	130	15	0.456	0.109	23.8	0.029	0.478	0.163	34.1	0.637	0.446	0.207	46.5	0.002	.t.	...		
Kentucky Warbler	17	696	1129	173	0.596	0.030	5.1	0.000	0.506	0.042	8.3	0.000	0.338	0.045	13.3	0.029	...			
Common Yellowthroat	16	519	804	88	0.453	0.041	9.0	0.024	0.468	0.064	13.8	0.265	0.413	0.079	19.1	0.007	...	.t.		
Hooded Warbler	6	196	273	20	0.376	0.090	24.0	0.001	0.391	0.140	35.9	0.004	0.482	0.203	42.2	0.003	...			
Yellow-breasted Chat	10	993	1612	231	0.510	0.027	5.3	0.047	0.414	0.037	8.9	0.926	0.599	0.069	11.5	0.011	.t.			
Summer Tanager	24	344	422	45	0.546	0.062	11.4	0.002	0.255	0.066	26.1	0.011	0.501	0.148	29.5	0.002	...			
Olive Sparrow	4	241	465	75	0.511	0.048	9.4	0.002	0.757	0.065	8.6	0.004	0.503	0.099	19.8	0.007	...			
Eastern Towhee†	13	69	87	8	0.484	0.144	29.8	0.000	0.154	0.123	80.0	0.001	1.000	0.832	83.2	0.000	...			
Rufous-crowned Sparrow	7	90	139	17	0.454	0.096	21.1	0.278	0.454	0.147	32.4	0.002	0.509	0.220	43.2	0.000	...	t..		

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival: Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture: Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of: Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
Field Sparrow	32	1210	1750	207	0.484	0.027	5.6	0.007	0.331	0.035	10.7	0.874	0.607	0.077	12.7	0.015	.t.			
Lark Sparrow*†	7	142	152	4	0.532	0.236	44.3	0.000	0.033	0.072	214.8	0.000	1.000	2.139	213.9	0.000	...			
Grasshopper Sparrow	6	224	337	35	0.439	0.069	15.7	0.040	0.358	0.095	26.7	0.333	0.607	0.189	31.2	0.001	...	.t.		
Northern Cardinal	56	3416	5052	735	0.547	0.015	2.8	0.932	0.376	0.019	5.1	0.715	0.551	0.036	6.5	0.001	tt.	t..		
Pyrrhuloxia*	2	129	134	3	0.955	0.252	26.4	0.000	0.230	0.206	89.7	0.000	0.035	0.032	91.9	0.000	...			
Blue Grosbeak*†	7	72	81	3	0.299	0.226	75.6	0.001	0.131	0.218	166.2	0.000	1.000	1.615	161.5	0.000	...			
Indigo Bunting	28	1826	2665	313	0.464	0.023	5.0	0.040	0.441	0.034	7.7	0.002	0.480	0.049	10.1	0.176	...			
Painted Bunting	32	1949	2644	312	0.541	0.024	4.4	0.046	0.459	0.033	7.2	0.045	0.324	0.032	9.9	0.770	..t			
Dickcissel	15	697	784	29	0.438	0.073	16.6	0.004	0.230	0.084	36.7	0.007	0.285	0.116	40.6	0.028	...			
Eastern Meadowlark	11	54	64	5	0.589	0.167	28.4	0.000	0.349	0.214	61.2	0.000	0.223	0.179	80.1	0.000	...			
Bronzed Cowbird	2	73	92	10	0.454	0.143	31.4	0.000	0.350	0.197	56.3	0.000	0.639	0.451	70.7	0.000	...			
Brown-headed Cowbird	42	630	828	92	0.491	0.043	8.7	0.003	0.275	0.050	18.4	0.815	0.658	0.137	20.9	0.004	.t.			
Orchard Oriole	15	226	270	17	0.390	0.099	25.3	0.023	0.288	0.137	47.4	0.002	0.496	0.263	53.1	0.226	...			
American Goldfinch	19	561	658	39	0.360	0.064	17.7	0.107	0.188	0.072	38.5	0.106	0.732	0.291	39.8	0.006	...			
Mean (62 species)	15	453	644	74	0.504	0.099	20.6	0.066	0.324	0.106	48.5	0.143	0.538	0.330	53.7	0.051				
Mean (49 better-estimated sp.)[n]	17	543	779	92	0.498	0.072	14.8	0.083	0.363	0.089	28.9	0.181	0.489	0.162	34.7	0.064				
NORTHEAST MAPS REGION																				
Red-bellied Woodpecker†	19	70	81	7	0.547	0.158	28.8	0.000	0.112	0.115	102.7	0.001	1.000	1.046	104.6	0.000	...			
Yellow-bellied Sapsucker	12	119	161	16	0.467	0.108	23.2	0.005	0.370	0.145	39.3	0.012	0.502	0.244	48.7	0.011	...			
Downy Woodpecker	62	547	714	67	0.443	0.050	11.4	0.007	0.529	0.081	15.2	0.007	0.283	0.062	22.0	0.002	...			
Hairy Woodpecker	38	170	218	24	0.807	0.073	9.0	0.000	0.098	0.039	39.8	0.004	0.598	0.239	39.9	0.002	...			
Northern Flicker	36	126	145	9	0.553	0.140	25.3	0.000	0.164	0.117	71.2	0.001	0.446	0.337	75.4	0.004	...			
Eastern Wood-Pewee	35	212	275	25	0.497	0.081	16.3	0.002	0.313	0.098	31.3	0.168	0.399	0.148	37.1	0.010	...			
Acadian Flycatcher	13	167	216	13	0.592	0.112	19.0	0.000	0.286	0.118	41.1	0.016	0.215	0.110	51.4	0.001	...			
"Traill's" Flycatcher	20	808	1074	84	0.457	0.044	9.6	0.014	0.549	0.070	12.8	0.061	0.189	0.037	19.9	0.197	...			
Least Flycatcher*†	11	222	245	3	0.555	0.227	40.9	0.003	0.014	0.035	244.5	0.000	1.000	2.438	243.8	0.004	...			
Eastern Phoebe	27	272	376	28	0.507	0.075	14.8	0.047	0.426	0.105	24.7	0.018	0.215	0.073	34.2	0.001	...			
Great Crested Flycatcher	35	181	202	14	0.654	0.106	16.2	0.002	0.124	0.071	57.6	0.007	0.434	0.260	60.0	0.015	...			
Eastern Kingbird	9	50	70	9	0.528	0.136	25.7	0.000	0.511	0.196	38.4	0.000	0.367	0.212	57.7	0.000	...			
White-eyed Vireo	13	342	551	71	0.457	0.049	10.7	0.002	0.415	0.070	17.0	0.001	0.646	0.137	21.2	0.000	...			
Yellow-throated Vireo*	4	34	39	4	0.566	0.226	39.9	0.000	0.314	0.255	81.4	0.000	0.372	0.374	100.5	0.000	...			
Blue-headed Vireo	15	151	187	13	0.393	0.115	29.3	0.001	0.205	0.125	61.0	0.004	0.712	0.443	62.2	0.001	...			

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival: Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture: Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of: Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
Warbling Vireo	10	100	128	10	0.368	0.121	32.9	0.000	0.528	0.223	42.3	0.005	0.322	0.189	58.8	0.000	...			
Red-eyed Vireo	64	1777	2338	252	0.555	0.027	4.8	0.069	0.270	0.028	10.5	0.112	0.505	0.061	12.0	0.002	...			
Blue Jay	55	375	407	23	0.770	0.085	11.0	0.000	0.174	0.064	36.6	0.001	0.170	0.071	41.9	0.622	..t	...		
Carolina Chickadee	20	230	267	23	0.517	0.100	19.3	0.002	0.310	0.117	37.9	0.012	0.385	0.174	45.2	0.006	...			
Black-capped Chickadee	61	1454	2048	232	0.513	0.028	5.4	0.712	0.298	0.032	10.7	0.014	0.594	0.073	12.3	0.014	t..	...		
Tufted Titmouse	49	561	754	76	0.378	0.049	12.9	0.029	0.298	0.067	22.4	0.004	0.901	0.221	24.5	0.001	...			
White-breasted Nuthatch	29	126	159	14	0.414	0.115	27.8	0.003	0.280	0.150	53.7	0.009	0.675	0.405	60.0	0.001	...			
Carolina Wren	24	488	667	46	0.365	0.061	16.6	0.269	0.447	0.101	22.7	0.014	0.334	0.092	27.4	0.007	...	t..		
House Wren	24	345	477	23	0.276	0.078	28.3	0.010	0.376	0.147	39.1	0.006	0.455	0.185	40.6	0.019	...			
Eastern Bluebird	12	96	158	11	0.465	0.120	25.9	0.002	0.245	0.126	51.3	0.006	0.547	0.308	56.2	0.001	...			
Veery	43	2052	4006	782	0.581	0.014	2.5	0.091	0.558	0.020	3.6	0.150	0.508	0.031	6.0	0.091	...			
Bicknell's Thrush	1	28	45	10	0.613	0.124	20.3	0.000	0.318	0.150	47.2	0.000	0.840	0.479	57.0	0.000	...			
Swainson's Thrush	6	124	249	57	0.602	0.062	10.4	0.174	0.628	0.080	12.8	0.009	0.625	0.130	20.9	0.039	...			
Hermit Thrush	29	449	848	142	0.475	0.036	7.5	0.457	0.644	0.055	8.6	0.742	0.541	0.079	14.6	0.152	.t.	t..	tt.	.tt
Wood Thrush	59	2340	3571	303	0.426	0.022	5.3	0.117	0.401	0.034	8.4	0.105	0.405	0.043	10.5	0.233	...	..t		
American Robin	67	2022	2570	202	0.461	0.031	6.7	0.009	0.293	0.037	12.5	0.007	0.469	0.066	14.1	0.007	...			
Gray Catbird	62	6331	10265	1337	0.516	0.011	2.2	0.008	0.455	0.016	3.5	0.973	0.470	0.023	4.8	0.007	.t.			
Brown Thrasher	15	120	167	17	0.500	0.102	20.3	0.002	0.180	0.091	50.6	0.007	0.997	0.529	53.1	0.017	...			
Cedar Waxwing*†	38	1537	1595	2	0.715	0.282	39.4	0.002	0.001	0.004	477.2	0.002	1.000	4.735	473.5	0.001	...			
Blue-winged Warbler	17	369	465	42	0.403	0.062	15.4	0.016	0.382	0.095	24.9	0.099	0.454	0.138	30.4	0.166	...			
Nashville Warbler	8	257	312	11	0.348	0.127	36.5	0.010	0.134	0.104	78.0	0.257	0.659	0.499	75.7	0.001	...			
Northern Parula	7	136	174	15	0.484	0.107	22.1	0.003	0.518	0.162	31.2	0.075	0.212	0.099	46.8	0.011	...			
Yellow Warbler	33	1842	2773	358	0.500	0.023	4.5	0.001	0.486	0.032	6.6	0.002	0.432	0.040	9.3	0.999	..t			
Chestnut-sided Warbler	17	516	831	105	0.495	0.039	7.8	0.045	0.444	0.056	12.6	0.047	0.449	0.078	17.3	0.009	...			
Magnolia Warbler	12	517	810	83	0.409	0.045	11.0	0.978	0.605	0.077	12.8	0.024	0.350	0.069	19.7	0.001	t..			
Black-throated Blue Warbler	7	124	172	22	0.500	0.090	17.9	0.000	0.457	0.127	27.9	0.000	0.423	0.160	37.7	0.003	...			
Yellow-rumped Warbler	12	331	495	64	0.455	0.052	11.4	0.007	0.461	0.078	17.0	0.001	0.510	0.114	22.4	0.002	...			
Black-throated Green Warbler	19	445	683	84	0.395	0.046	11.5	0.004	0.568	0.079	13.9	0.071	0.533	0.104	19.5	0.071	...			
Blackburnian Warbler	5	46	57	5	0.566	0.189	33.5	0.000	0.106	0.111	104.4	0.000	0.899	0.946	105.2	0.000	...			
Pine Warbler*	8	107	141	9	0.222	0.130	58.4	0.000	0.404	0.301	74.4	0.000	0.913	0.694	76.0	0.000	...			
Blackpoll Warbler	2	80	109	6	0.338	0.128	37.9	0.000	0.577	0.281	48.7	0.000	0.076	0.081	106.6	0.000	...			
Black-and-white Warbler	40	746	1042	126	0.518	0.037	7.2	0.139	0.330	0.046	13.9	0.136	0.536	0.090	16.7	0.174	...			
American Redstart	40	2325	3326	352	0.511	0.022	4.4	0.007	0.340	0.028	8.1	0.004	0.459	0.045	9.8	0.981	..t			
Worm-eating Warbler	12	499	699	66	0.501	0.051	10.2	0.011	0.394	0.069	17.6	0.011	0.364	0.082	22.4	0.011	...			

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival: Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture: Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of: Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
Ovenbird	61	2134	3147	433	0.570	0.020	3.5	0.001	0.414	0.026	6.2	0.001	0.403	0.034	8.4	0.119	...			
Northern Waterthrush	4	96	127	12	0.400	0.110	27.4	0.000	0.500	0.188	37.7	0.000	0.384	0.203	52.8	0.002	...			
Louisiana Waterthrush	12	222	394	37	0.468	0.061	13.0	0.005	0.679	0.101	14.9	0.000	0.186	0.063	34.1	0.109	...			
Kentucky Warbler	4	63	95	13	0.558	0.114	20.4	0.000	0.423	0.153	36.2	0.000	0.347	0.170	49.1	0.001	...			
Mourning Warbler	3	58	91	7	0.637	0.147	23.1	0.000	0.110	0.079	71.2	0.000	0.748	0.532	71.2	0.000	...			
Common Yellowthroat	58	2768	4390	522	0.493	0.018	3.6	0.001	0.504	0.026	5.2	0.002	0.376	0.029	7.7	0.001	...			
Hooded Warbler	15	601	1034	121	0.430	0.037	8.6	0.017	0.645	0.061	9.5	0.001	0.395	0.064	16.1	0.047	...			
Canada Warbler	7	131	163	12	0.374	0.116	31.0	0.001	0.576	0.209	36.3	0.003	0.239	0.127	53.2	0.002	...			
Yellow-breasted Chat	6	233	332	41	0.462	0.063	13.7	0.002	0.397	0.091	22.9	0.001	0.520	0.147	28.2	0.004	...			
Scarlet Tanager	42	360	410	18	0.564	0.098	17.5	0.002	0.052	0.038	73.7	0.012	0.927	0.676	73.0	0.004	...			
Eastern Towhee	44	662	938	120	0.483	0.039	8.0	0.002	0.372	0.051	13.7	0.001	0.575	0.096	16.7	0.001	...			
Chipping Sparrow	24	317	428	37	0.413	0.070	16.9	0.000	0.310	0.091	29.2	0.001	0.629	0.203	32.3	0.000	...			
Song Sparrow	40	1518	2561	217	0.369	0.026	7.2	0.692	0.478	0.046	9.7	0.082	0.527	0.065	12.4	0.728	t.t	t..	..t	
Swamp Sparrow	9	192	330	46	0.483	0.061	12.7	0.978	0.601	0.094	15.6	0.002	0.415	0.107	25.8	0.005	t..			
White-throated Sparrow	15	595	923	75	0.263	0.040	15.0	0.064	0.604	0.097	16.1	0.068	0.573	0.125	21.8	0.771	..t			
Dark-eyed Junco	16	391	564	44	0.399	0.061	15.3	0.003	0.346	0.086	25.0	0.044	0.522	0.147	28.2	0.100	...			
Northern Cardinal	51	1123	1592	227	0.610	0.029	4.7	0.801	0.371	0.033	9.0	0.186	0.457	0.053	11.5	0.011	t..			
Rose-breasted Grosbeak	28	433	518	33	0.488	0.073	15.0	0.001	0.254	0.079	31.0	0.076	0.336	0.117	34.9	0.001	...			
Indigo Bunting	31	596	834	87	0.427	0.043	10.2	0.362	0.556	0.072	13.0	0.055	0.346	0.066	19.2	0.004	...	t..		
Red-winged Blackbird	24	604	698	50	0.552	0.060	10.9	0.156	0.314	0.071	22.5	0.245	0.257	0.069	27.0	0.003	...	.t.		
Common Grackle	24	402	426	14	0.338	0.117	34.5	0.005	0.257	0.167	65.1	0.004	0.309	0.224	72.4	0.079	...			
Brown-headed Cowbird	39	223	262	18	0.315	0.102	32.5	0.003	0.356	0.177	49.8	0.000	0.583	0.346	59.3	0.063	...			
Orchard Oriole*†	2	31	36	3	0.522	0.277	53.0	0.000	0.100	0.169	168.8	0.000	1.000	1.684	168.4	0.000	...			
Baltimore Oriole	29	404	511	32	0.373	0.070	18.7	0.129	0.470	0.122	26.0	0.217	0.288	0.096	33.5	0.035	...			
Purple Finch†	10	128	167	16	0.319	0.100	31.2	0.354	0.340	0.174	51.1	0.056	1.000	0.594	59.4	0.008	...	t..		
American Goldfinch	54	2409	2761	138	0.416	0.037	8.9	0.019	0.211	0.039	18.5	0.101	0.436	0.086	19.7	0.797	..t			
Mean (75 species)	25	654	948	102	0.479	0.084	18.2	0.091	0.368	0.098	42.7	0.058	0.509	0.312	48.9	0.091				
Mean (61 better-estimated sp.)[n]	28	749	1104	124	0.489	0.066	13.7	0.106	0.390	0.083	25.8	0.066	0.472	0.155	31.3	0.109				
SOUTHEAST MAPS REGION																				
Red-bellied Woodpecker	53	189	213	12	0.312	0.120	38.4	0.005	0.282	0.189	67.0	0.059	0.570	0.418	73.4	0.010	...			
Downy Woodpecker	67	461	545	45	0.621	0.062	10.0	0.001	0.331	0.070	21.1	0.000	0.204	0.054	26.7	0.011	...			
Hairy Woodpecker	35	121	143	15	0.524	0.113	21.5	0.001	0.141	0.095	67.0	0.001	0.991	0.701	70.8	0.000	...			

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival: Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture: Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of: Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
Eastern Wood-Pewee	46	269	342	37	0.522	0.075	14.4	0.002	0.442	0.098	22.2	0.018	0.333	0.100	30.0	0.000	...			
Acadian Flycatcher	53	2163	3144	398	0.483	0.021	4.3	0.005	0.535	0.032	5.9	0.003	0.380	0.033	8.8	0.268	...	..t		
Great Crested Flycatcher	40	241	266	13	0.459	0.120	26.2	0.001	0.224	0.127	56.7	0.007	0.311	0.191	61.3	0.002	...			
White-eyed Vireo	43	1174	2170	265	0.461	0.024	5.2	0.018	0.537	0.039	7.2	0.003	0.456	0.050	11.0	0.007	...			
Red-eyed Vireo	61	2592	3373	422	0.599	0.020	3.3	0.290	0.238	0.020	8.2	0.034	0.532	0.049	9.2	0.014	...	t..		
Blue Jay	60	396	440	31	0.672	0.075	11.1	0.001	0.105	0.046	43.9	0.093	0.487	0.219	44.9	0.388	...	..t		
Carolina Chickadee	71	695	841	71	0.499	0.051	10.3	0.000	0.228	0.052	22.8	0.001	0.511	0.126	24.6	0.000	...			
Tufted Titmouse	72	1204	1700	228	0.498	0.028	5.6	0.996	0.447	0.039	8.8	0.004	0.469	0.055	11.7	0.002	t..			
Carolina Wren	70	1741	2878	293	0.358	0.022	6.1	0.999	0.589	0.043	7.2	0.001	0.507	0.054	10.6	0.030	t..			
House Wren	4	67	95	5	0.478	0.177	37.0	0.000	0.151	0.129	85.8	0.000	0.536	0.465	86.7	0.000	...			
Wood Thrush	58	3214	5804	614	0.449	0.016	3.5	0.071	0.558	0.026	4.7	0.071	0.392	0.029	7.3	0.017	...			
American Robin	20	560	602	21	0.431	0.093	21.5	0.048	0.123	0.072	58.9	0.581	0.472	0.283	60.0	0.002	.t.	...		
Gray Catbird	24	1187	1745	161	0.421	0.031	7.3	0.484	0.451	0.049	10.9	0.025	0.381	0.055	14.3	0.009	...	t..		
Brown Thrasher	24	217	271	26	0.713	0.077	10.8	0.001	0.159	0.056	35.3	0.076	0.410	0.151	36.9	0.001	...			
Blue-winged Warbler	9	313	466	56	0.540	0.053	9.9	0.004	0.285	0.060	21.0	0.007	0.565	0.137	24.3	0.000	...			
Northern Parula	24	270	293	14	0.220	0.098	44.8	0.001	0.670	0.258	38.5	0.002	0.308	0.187	60.6	0.001	...			
Yellow Warbler†	1	59	76	8	0.418	0.155	37.1	0.000	0.235	0.179	76.2	0.001	1.000	0.803	80.3	0.000	...			
Pine Warbler*	24	133	141	3	0.650	0.281	43.3	0.000	0.230	0.220	95.8	0.000	0.065	0.073	111.7	0.000	...			
Prairie Warbler	20	492	671	59	0.421	0.055	13.1	0.004	0.353	0.076	21.5	0.029	0.497	0.124	24.9	0.002	...			
Black-and-white Warbler	18	189	227	18	0.654	0.110	16.8	0.001	0.114	0.065	57.1	0.001	0.723	0.428	59.1	0.001	...			
American Redstart*†	3	51	59	5	0.485	0.201	41.4	0.000	0.123	0.167	136.1	0.000	1.000	1.407	140.7	0.000	...			
Prothonotary Warbler	14	385	495	46	0.487	0.061	12.5	0.011	0.282	0.072	25.5	0.002	0.518	0.151	29.2	0.002	...			
Worm-eating Warbler	17	367	537	73	0.594	0.050	8.3	0.004	0.436	0.063	14.4	0.003	0.355	0.072	20.2	0.011	...			
Swainson's Warbler	6	70	96	7	0.678	0.146	21.5	0.000	0.119	0.089	74.9	0.000	0.549	0.426	77.5	0.000	...			
Ovenbird	47	1847	2791	346	0.525	0.022	4.2	0.001	0.467	0.031	6.7	0.003	0.374	0.035	9.5	0.004	...			
Louisiana Waterthrush	20	379	670	94	0.531	0.045	8.5	0.014	0.600	0.063	10.6	0.050	0.404	0.071	17.7	0.006	...			
Kentucky Warbler	37	1403	2623	397	0.503	0.020	4.0	0.002	0.614	0.031	5.0	0.047	0.444	0.039	8.8	0.002	...			
Common Yellowthroat	44	1691	2875	264	0.420	0.023	5.5	0.617	0.532	0.040	7.5	0.030	0.340	0.039	11.4	0.101	t..	...		
Hooded Warbler	32	759	1380	164	0.508	0.031	6.0	0.011	0.495	0.046	9.3	0.002	0.387	0.055	14.1	0.007	...			
Yellow-breasted Chat	26	640	953	95	0.335	0.039	11.5	0.623	0.565	0.077	13.7	0.380	0.516	0.097	18.8	0.001	t..	.t.		
Summer Tanager	32	276	334	22	0.441	0.094	21.2	0.099	0.299	0.116	38.8	0.005	0.412	0.181	43.9	0.012	...			
Scarlet Tanager	39	315	361	22	0.588	0.088	15.0	0.000	0.105	0.054	51.1	0.003	0.574	0.299	52.0	0.001	...			
Eastern Towhee	47	336	477	57	0.451	0.055	12.3	0.004	0.322	0.072	22.5	0.047	0.739	0.190	25.7	0.001	...			
Chipping Sparrow*	6	44	49	2	0.887	0.286	32.2	0.000	0.157	0.172	109.6	0.000	0.078	0.104	132.4	0.000	...			

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival: Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture: Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of: Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
Field Sparrow	18	264	380	45	0.351	0.061	17.3	0.001	0.522	0.110	21.1	0.817	0.633	0.176	27.8	0.001	.t.			
Song Sparrow	2	189	305	32	0.380	0.066	17.4	0.408	0.529	0.120	22.7	0.226	0.412	0.134	32.6	0.005	t..	...	.t.	
Northern Cardinal	74	2668	4096	596	0.532	0.017	3.2	0.003	0.391	0.022	5.7	0.011	0.587	0.042	7.2	0.001	...			
Indigo Bunting	50	1533	2140	244	0.501	0.027	5.3	0.499	0.319	0.032	10.2	0.500	0.565	0.067	11.9	0.002	...	tt.		
Painted Bunting	2	64	101	19	0.709	0.127	17.9	0.000	0.384	0.121	31.3	0.000	0.460	0.176	38.2	0.000	...			
Common Grackle†	20	632	651	11	0.257	0.126	49.0	0.007	0.052	0.109	210.6	0.026	1.000	2.148	214.8	0.007	...			
Brown-headed Cowbird	36	166	195	12	0.394	0.118	30.1	0.036	0.457	0.193	42.2	0.125	0.334	0.185	55.6	0.002	...			
American Goldfinch	25	866	991	63	0.528	0.053	10.1	0.003	0.150	0.042	27.9	0.003	0.498	0.145	29.2	0.001	...			
Mean (45 species)	33	731	1089	121	0.500	0.081	16.8	0.117	0.341	0.086	38.7	0.073	0.495	0.245	43.7	0.021				
Mean (36 better-estimated sp.)[n]	37	869	1312	149	0.511	0.058	11.2	0.145	0.361	0.063	24.4	0.086	0.483	0.145	28.1	0.025				
ALASKA AND BOREAL CANADA MAPS REGIONS																				
Western Wood-Pewee	2	84	110	12	0.430	0.122	28.5	0.000	0.664	0.190	28.6	0.000	0.323	0.165	51.1	0.000	...			
"Traill's" Flycatcher	14	585	820	50	0.375	0.050	13.5	0.007	0.517	0.094	18.2	0.002	0.236	0.062	26.2	0.005	...			
Gray Jay†	11	53	78	16	0.522	0.098	18.8	0.000	0.400	0.135	33.8	0.000	1.000	0.424	42.4	0.000	...			
Tree Swallow*†	1	77	91	6	0.213	0.143	67.2	0.000	0.326	0.334	102.3	0.000	1.000	1.145	114.5	0.000	...			
Black-capped Chickadee	11	251	395	45	0.412	0.056	13.5	0.125	0.384	0.086	22.4	0.324	0.805	0.218	27.1	0.043	...	.t.		
Boreal Chickadee	10	133	200	29	0.445	0.075	16.9	0.056	0.337	0.102	30.3	0.107	0.897	0.313	34.9	0.003	...			
Arctic Warbler	2	259	481	52	0.324	0.050	15.6	0.029	0.630	0.104	16.5	0.003	0.648	0.163	25.2	0.001	...			
Gray-cheeked Thrush	6	253	539	74	0.441	0.044	10.1	0.000	0.705	0.072	10.2	0.000	0.527	0.108	20.4	0.001	...			
Swainson's Thrush	17	900	1483	206	0.457	0.028	6.0	0.061	0.583	0.044	7.6	0.101	0.492	0.060	12.1	0.101	...			
Hermit Thrush	10	643	1383	191	0.487	0.028	5.7	0.499	0.777	0.040	5.2	0.004	0.342	0.047	13.8	0.011	...	t..		
American Robin†	16	392	469	29	0.305	0.073	24.1	0.027	0.192	0.096	50.0	0.002	1.000	0.517	51.7	0.000	...			
Varied Thrush*†	10	115	136	5	0.218	0.166	75.9	0.001	0.202	0.290	143.3	0.001	1.000	1.478	147.8	0.000	...			
Orange-crowned Warbler	16	1377	2123	193	0.393	0.026	6.7	0.040	0.529	0.048	9.0	0.176	0.374	0.049	13.1	0.002	...			
Yellow Warbler	11	1176	1853	162	0.413	0.030	7.2	0.121	0.501	0.050	10.1	0.009	0.385	0.055	14.2	0.011	...			
Yellow-rumped Warbler	18	745	968	79	0.364	0.044	12.2	0.001	0.446	0.077	17.3	0.004	0.445	0.097	21.9	0.004	...			
Townsend's Warbler*	4	159	199	8	0.197	0.112	56.7	0.000	0.430	0.309	71.7	0.000	0.492	0.385	78.2	0.001	...			
Blackpoll Warbler	5	98	164	17	0.300	0.084	28.2	0.001	0.814	0.163	20.0	0.000	0.513	0.223	43.5	0.001	...			
American Redstart	4	373	535	65	0.561	0.051	9.1	0.008	0.313	0.060	19.1	0.993	0.534	0.120	22.5	0.002	.t.			
Ovenbird	3	124	162	9	0.423	0.144	34.1	0.000	0.484	0.226	46.8	0.000	0.211	0.130	61.5	0.000	...			
Northern Waterthrush	10	277	463	59	0.509	0.052	10.3	0.004	0.710	0.076	10.6	0.002	0.280	0.065	23.3	0.000	...			
Mourning Warbler	3	78	120	15	0.335	0.100	29.7	0.000	0.478	0.187	39.1	0.000	0.909	0.449	49.4	0.000	...			

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival: Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture: Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of: Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l] 1	2	3	4
Wilson's Warbler	15	2919	4758	350	0.344	0.018	5.3	0.019	0.595	0.038	6.4	0.860	0.297	0.030	10.1	0.664	.tt	.t.		
Canada Warbler	3	195	340	41	0.482	0.063	13.2	0.002	0.483	0.094	19.5	0.000	0.514	0.141	27.5	0.011	...			
American Tree Sparrow	7	203	338	35	0.460	0.063	13.8	0.001	0.548	0.104	19.0	0.001	0.335	0.103	30.6	0.002	...			
Chipping Sparrow	5	67	99	9	0.328	0.127	38.8	0.000	0.391	0.226	57.7	0.000	0.789	0.515	65.3	0.000	...			
Savannah Sparrow	6	130	166	12	0.294	0.111	37.6	0.000	0.738	0.218	29.6	0.000	0.340	0.188	55.3	0.000	...			
Fox Sparrow	13	411	664	84	0.511	0.042	8.3	0.179	0.568	0.065	11.5	0.021	0.353	0.068	19.3	0.802	..t			
Lincoln's Sparrow	12	320	575	30	0.401	0.066	16.4	0.000	0.315	0.091	28.8	0.004	0.387	0.134	34.7	0.001	...			
White-throated Sparrow	4	261	395	24	0.470	0.085	18.0	0.174	0.198	0.074	37.4	0.006	0.576	0.225	39.0	0.003	...			
White-crowned Sparrow	13	649	1079	119	0.411	0.035	8.5	0.049	0.417	0.056	13.3	0.592	0.678	0.113	16.6	0.001	.t.	...		
Golden-crowned Sparrow	5	281	539	76	0.498	0.043	8.6	0.006	0.522	0.067	12.9	0.118	0.522	0.107	20.4	0.001	...			
Dark-eyed Junco	15	654	1142	113	0.302	0.032	10.6	0.002	0.632	0.072	11.4	0.001	0.694	0.118	17.0	0.001	...			
Pine Grosbeak	7	87	109	8	0.445	0.150	33.8	0.001	0.362	0.214	59.2	0.004	0.389	0.286	73.5	0.000	...			
Common Redpoll	14	1631	2035	18	0.385	0.098	25.4	0.003	0.026	0.018	68.7	0.006	0.780	0.489	62.8	0.000	...			
Mean (34 species)	9	469	736	66	0.396	0.074	21.4	0.042	0.477	0.121	32.0	0.098	0.561	0.259	40.2	0.049				
Mean (25 better-estimated sp.)[n]	10	590	940	86	0.420	0.055	13.7	0.055	0.508	0.083	19.7	0.133	0.514	0.149	27.1	0.067				

[a] Using the computer program TMSURVIV (Hines et al. 2003), a modification of SURVIV (White 1983) to accommodate transient models.

[b] These models, developed by Pradel et. al (1997), modified by Nott and DeSante (2002), and fully formulated by Hines et al. (2003), include both between- and within-year information on transients and permit the estimation of three parameters: apparent survival probability (φ), recapture probability (p), and proportion of residents among those newly-banded adults that were not recaptured at least seven days later during their first year of capture (τ). In the time-constant model, each of these three parameters is constrained to be constant over all years.

[c] Species included are those for which (a) an average of at least 2.5 individual adult birds were captured per year over the twelve years 1992-2003 (30 year-unique records), (b) at least two returns were recorded during the twelve years from all stations pooled, and (c) survival and recapture probabilities were neither 1.000 nor 0.000. Data for any given species were only included from stations where the species was a regular or usual breeder and summer resident (i.e., attempted to breed during all or more than half of the years, respectively, that the station was operated).

[d] Number of super-stations that were operated for a least four consecutive years during the twelve-year period 1992-2003 at which (a) at least one adult individual of the species was captured and (b) the species was a regular or usual breeder. A super-station includes all stations within one km of each other.

[e] Total number of individual adult birds captured during the twelve years 1992-2003 at stations where the species was a regular or usual breeder; thus the number of capture histories upon which the estimates of survival probability, recapture probability, and proportion of residents were based.

[f] Total number of captures of adults of the species during the twelve years 1992-2003 at stations where the species was a regular or usual breeder.

[g] Total number of returns during the twelve years 1992-2003 at stations where the species was a regular or usual breeder. A return is defined as the first capture of an individual adult birds in any year other than the year during which it was initially banded.

[h] Defined as the probability of an adult bird surviving to and returning in a particular year (breeding season) to the area where it was present in the previous year (breeding season). The estimated probability (φ), standard error of the estimate (SE(φ)), and coefficient of variation (CV(φ)=100*SE(φ)/φ) are presented.

[i] The amount of support for time-dependence for each of the three parameters is provided by summing the w_i for all models in which time dependence of the

TABLE 3. Continued.

Species[c]	No. stn.[d]	No. indv.[e]	No. capt.[f]	No. btwn. year recap.[g]	Survival: Survival probability[h] φ	SE(φ)	CV(φ)	$w(\varphi_i)$[i]	Recapture: Recapture probability[j] p	SE(p)	CV(p)	$w(p_i)$[i]	Proportion of: Proportion of residents[k] τ	SE(τ)	CV(τ)	$w(\tau_i)$[i]	Models selected[l]: 1	2	3	4

parameter of interest occurred (w_i; Burnham and Anderson 1998). w_i={exp(-ΔQAIC$_C$/2)}/Σ{exp(-ΔQAIC$_C$/2)} where QAIC$_C$ is the Akaike Information Criterion for model i, modified for small sample sizes and overdispersion of data, and ΔQAIC$_C$ is the difference between the QAIC$_C$ of model i and the model with the lowest QAIC$_C$. Values of w_i greater than 0.50 indicate strong support for time dependence in the parameter, while 0.5>w_i>0.25 suggest some support for time dependence in the parameter. Despite substantial support for time-dependence in one or more parameters, all parameter estimates presented in this table are for the time-constant model.

[j] Defined as the conditional probability of recapturing an adult bird at least once in a particular year (breeding season), given that it did survive and return to the area where it was present in the previous year (breeding season). Again, the estimated probability (p), standard error of the estimate (SE(p)), and coefficient of variation (CV(p)) are presented.

[k] The estimated proportion of residents among those newly-banded adults that were not recaptured seven or more days later during their first year of capture. Again, the estimated proportion (τ), standard error of the estimate (SE(τ)), and coefficient of variation (CV(τ)) are presented.

[l] Models involving time dependence were selected according to modified Akaike's Information Criterion (QAIC$_C$), with the selected model (Model 1) being the one with the lowest QAIC$_C$. All equivalent models (models with a QAIC$_C$ within 2.0 units of the selected model) are shown and listed in order (Models 2-5) of increasing QAIC$_C$. Despite time-dependence in one or more parameters (e.g., φ_t) being selected for a number of species, all parameter estimates presented in this summary are for the time-constant model. Models are designated as follows: ...=$\varphi p \tau$; t..=$\varphi_t p \tau$; .t.=$\varphi p_t \tau$; ..t=$\varphi p \tau_t$; tt.=$\varphi_t p_t \tau$; t.t=$\varphi_t p \tau_t$; .tt=$\varphi p_t \tau_t$; ttt=$\varphi_t p_t \tau_t$, where φ is the survival probability, p is the recapture probability, and τ is the proportion of residents among those newly-captured adults that were not recaptured seven or more days later during their first year of capture.

[m] Includes Red-naped x Red-breasted Sapsucker hybrid.

[n] Better-estimated species are those for which CV(φ)<30.0% and φ is not qualified by the use of * or †.

* The estimate for survival probability should be viewed with caution because it is based on fewer than five between-year recaptures or the estimate is very imprecise (SE(φ) ≥ 0.200 or CV(φ) ≥ 50.0%)

† The estimate for survival probability, recapture probability, or both may be biased low because the estimate for τ was 1.00.

TABLE 4. Comparison of numbers of stations contributing data to survivorship analyses, numbers of species for which survivorship could be estimated, and precision of the survivorship estimates using data from the ten years, 1992-2001, and the twelve years, 1992-2003.

	No. stations		No. species		Mean CV(φ)		Number (proportion) of species with CV(φ)<30%		CV(φ)<20%		CV(φ)<10%	
Region	10-YR	12-YR	10-YR	12-YR	10-YR	12-YR	10-YR	12-YR	10-YR	12-YR	10-YR	12-YR
PROGRAM-WIDE	479	550	180	184	17.1%	15.0%	146 (0.811)	163 (0.886)	122 (0.678)	140 (0.761)	75 (0.417)	86 (0.467)
NORTHWEST	136	151	77	81	16.4%	15.3%	67 (0.870)	71 (0.877)	58 (0.753)	61 (0.753)	34 (0.442)	42 (0.519)
SOUTHWEST	68	83	72	86	22.3%	23.7%	57 (0.792)	64 (0.744)	40 (0.556)	50 (0.581)	17 (0.236)	25 (0.291)
NORTH-CENTRAL	38	44	54	54	23.0%	20.4%	38 (0.704)	43 (0.796)	32 (0.593)	33 (0.611)	10 (0.185)	15 (0.278)
SOUTH-CENTRAL	62	71	60	62	23.4%	20.6%	44 (0.733)	53 (0.855)	28 (0.467)	36 (0.581)	12 (0.200)	17 (0.274)
NORTHEAST	73	91	71	75	19.2%	18.3%	55 (0.775)	62 (0.827)	45 (0.634)	48 (0.640)	16 (0.225)	20 (0.267)
SOUTHEAST	73	79	41	45	18.7%	16.8%	34 (0.829)	36 (0.800)	27 (0.659)	31 (0.689)	13 (0.317)	16 (0.356)
ALASKA/BOREAL CANADA	29	31	36	34	22.8%	21.4%	27 (0.750)	27 (0.794)	20 (0.556)	22 (0.647)	8 (0.222)	9 (0.265)
Mean of regions	68	79	59	62	20.8%	19.5%	46 (0.779)	51 (0.813)	36 (0.603)	40 (0.643)	16 (0.261)	21 (0.321)

ranging from 1.33±0.20 in the South-central Region to 1.54±0.25 in the Alaska/Boreal Canada Region, and averaging 1.38±0.25 overall. Similarly, the average total number of returns per individual per species also remained remarkably constant over the seven regions, ranging from 0.132±0.069 in the South-central Region to 0.154±0.074 in the Alaska/Boreal Canada Region, and averaging 0.135±0.077 overall.

The precision of the estimates of annual adult survival rate using 12 years of data (1992-2003) from a total of 550 stations increased over that obtained from 10 years of data (1992-2001) from a total of 479 stations (Table 4). The mean coefficient of variation in survival probability, CV(φ), for all species in each region ranged from 15.3% in the Northwest Region to 23.7% in the Southwest Region and averaged 19.5±2.9% over the seven regions; the mean program-wide CV(φ) was 15.0%. These figures compare to a range from 16.4% in the Northwest Region to 23.4% in the South-central Region, an average of 20.8±2.7% over the seven regions, and 17.1% program-wide for 1992-2001 data, and represent only a 6% average improvement going from 10 to 12 years of data (Table 4), compared to an 8% average improvement going from seven to 10 years of data and a 28% average improvement going from five to seven years of data. Another measure of the increased precision provided by 12, rather than 10, years of data is the mean numbers of species over the seven regions having CV(φ)<30%, which increased by 11% from 46 species with 10 years of data to 51 species with 12 years of data. Similarly, the mean number of species per region having CV(φ)<20% also increased by 11% from 36 to 40 species; and the mean number having CV(φ)<10% increased by 31% from 16 to 21 species (Table 4). The analogous program-wide increases in the numbers of species were 11%, 15%, and 15%. The mean proportions of species over the seven regions having CV(φ)<30%, <20%, and <10% also increased with 12, rather than 10, years of data (by 4%, 7%, and 23%, respectively; Table 4). The analogous program-wide increases in the proportions of species were 9%, 12%, and 12%.

Mean regional survival probabilities for all species in each region (Table 3) ranged from 0.396 (Alaska/Boreal Canada) to 0.504 (both Southwest and South-central) and averaged 0.476±0.038 for the seven regions; the mean program-wide survival probability was 0.487. Mean recapture probabilities ranged from 0.324 (South-central) to 0.477 (Alaska/Boreal Canada) and averaged 0.367±0.054; the mean program-wide recapture probability was 0.340. The mean proportion of residents among newly-captured adults ranged from 0.495 (Southeast) to 0.561 (Alaska/Boreal Canada) and averaged 0.522±0.023; the mean program-wide proportion of residents was 0.500.

As in previous years, mean regional survival and recapture probabilities increased and mean regional proportion of residents decreased when consideration was limited in each region to species for which survival was "better estimated" (see Methods). Indeed, when consideration was limited to these better-estimated species, mean regional survival probabilities ranged from 0.420 (Alaska/Boreal Canada) to 0.525 (Southwest) and averaged 0.488±0.037 for the seven regions; the mean program-wide survival probability was 0.487. Mean recapture probabilities ranged from 0.361 (Southeast) to 0.508 (Alaska/Boreal Canada) and averaged 0.401±0.055; the mean program-wide recapture probability was 0.359. The mean proportion of residents among newly-captured adults ranged from 0.437 (North-central) to 0.514 (Alaska/Boreal Canada) and averaged 0.474±0.026; the mean program-wide proportion of residents was 0.466.

Again, as in previous years, mean regional survival rates for better-estimated species were higher for the three more southerly regions (Southwest: 0.525±0.067; Southeast: 0.511±0.058; South-central: 0.498±0.072) than for the three more northerly regions (Northwest: 0.501±0.049; Northeast: 0.489±0.066; North-central: 0.479±0.061), and were lowest for the far northern Alaska/Boreal Canada region (0.420±0.055). Moreover, mean regional survival rates for better-estimated species were higher for the two western regions, lower for two eastern regions, and lowest for the two central regions. In contrast, mean regional recapture probabilities for these same species tended to show the opposite pattern with respect to latitude, being lower in the Southeast (0.361±0.063) and South-central (0.363±0.089) regions than in the Northeast (0.390±0.083) and North-central (0.442±0.086) regions, and highest of all in the Alaska/Boreal Canada region (0.508±0.083).

Breaking this pattern, however, were the western regions, where recapture probabilities were slightly lower in the Northwest (0.369±0.056) than Southwest Region (0.375±0.079). Mean regional proportion of residents among newly captured adults for these same species showed relatively little variation and no distinct pattern, being lowest for the North-central and Southwest regions (0.437±0.119 and 0.448±0.138, respectively), and highest for the Alaska/Boreal Canada region (0.514±0.149).

In general, mean regional survival probabilities from 12 years of data (1992-2003) were lower than those from 10 years of data (1992-2001), both for all species for which survival was estimated [by an average of 0.008 (1.84%)] and for better-estimated species [by an average of 0.009 (1.86%)]. The only exceptions to this rule were the Northwest and Southeast regions for all species for which survival was estimated, and the Southwest Region for the better-estimated species. To control for potential differences in the species being compared, we ran matched-pairs *t*-tests between survival estimates from 12 and 10 years of data for those species-region combinations for which survival for the species was estimated with CV(φ)<30% for both sets of data. We found that regional survival estimates were lower for 12 than for 10 years of data for each of the seven regions, significantly so by 0.017 (3.9%) for the Alaska & Boreal Canada (t = 3.99, n = 26, P = 0.001), by 0.019 (3.6%) for the South-central (t = 2.46, n = 44, P = 0.018), and by 0.015 (2.9%) for the Northeast (t = 2.62, n = 55, P = 0.012) regions. For all 318 species-region combinations with CV(φ)<30% for both sets of data, survival estimates were highly significantly (t = 3.26, n = 318, P = 0.001) lower by 0.008 (1.6%) for 12 than for 10 years of data.

For each species in each region, we also modeled all possible combinations of time dependence in the three parameters, φ, p, τ. The selected model (the one having the lowest QAIC$_C$) and up to four equivalent models (those having a QAIC$_C$ within 2.0 QAIC$_C$ units of the QAIC$_C$ of the selected model) are presented for each species in each region in Table 3. The numbers and proportions of species in each region having time-dependent survival or showing time-dependence in any of the three parameters are presented in Table 5. We detected time-dependence in at least one parameter (by having a time-dependent model that was at least an equivalent model) for 114 (26.1%) of the 437 species-region combinations and for 56 (30.4%) of the 184 species program-wide. We found that time-dependence in at least one parameter was the selected model (by having a QAIC$_C$ that was at least 2.0 QAIC$_C$ units lower than the QAIC$_C$ of the fully time-independent model) for 73 (16.7%) of the 437 species-region combinations and for 25 (13.6%) of the 184 species program-wide. Time dependence in survival rate was detected for 56 (12.8%) of the 437 species-region combinations and for 30 (16.3%) of the 184 species program-wide, and was found to be the selected model for 22 (5.0%) of the species-region combinations and for 15 (8.2%) of the 184 species program-wide. In general, these proportions were slightly higher than analogous proportions using 10 years of data (Table 5 in this report versus Table 6 in DeSante and Kaschube 2006).

Finally, we examined all nine combinations of time-constant, time-dependent, and linear trend models for *program-wide* survival (φ) and recapture (p) probabilities for *all species pooled*. The selected model, which had 100% of the QAIC$_C$ weight (w_i), was the one whereby both survival and recapture probabilities varied with time, suggesting that survival varied substantially over the study period (Fig. 3c; note that survival probability from 2002-2003 and recapture probability in 2003 are confounded in the fully time-dependent model, so only 10 survival estimates were available over the 12-yr period). Although we found little statistical support for linear trend models compared to the more general time-varying models, the estimated slope for the best linear trend model was significantly negative (Beta = -0.021, $P < 0.05$), and suggested an annual decline in survival of -0.62%. A negative trend in survival was supported by a regression fit to annual survival estimates derived from the best time-varying model (P = 0.095). This model suggested a similar annual decline in survival (-0.83%). Of further interest was that seven of nine annual changes in survival rate (Fig.3c) were associated with annual changes in productivity of the same sign (Fig. 3b); indeed, annual survival from years t to t+1 tended to be correlated with the reproductive index in year t+1 (Fig. 4; r = 0.54, P = 0.10).

TABLE 5. Number (proportion) of species in each region for which time-dependence in survival rate, φ_t, or time-dependence in any parameter, φ_t, ρ_t, or τ_t was detected using modified Cormack-Jolly-Seber mark-recapture analyses from twelve years (1992-2003) of MAPS data.

	Number (proportion) of species								
Model	Program-wide	Northwest	Southwest	North-central	South-central	Northeast	Southeast	Ak/Bor.Can.	All regions
φ_t selected[a]	15 (0.082)	9 (0.111)	6 (0.070)	0 (0.000)	2 (0.032)	3 (0.040)	2 (0.044)	0 (0.000)	22 (0.050)
φ_t equivalent[b]	15 (0.082)	8 (0.099)	6 (0.070)	4 (0.074)	3 (0.048)	6 (0.080)	6 (0.133)	1 (0.029)	34 (0.077)
φ_t detected[c]	30 (0.163)	17 (0.210)	12 (0.140)	4 (0.074)	5 (0.081)	9 (0.120)	8 (0.178)	1 (0.029)	56 (0.128)
φ_t time-independent[d]	154 (0.867)	64 (0.790)	74 (0.860)	50 (0.926)	57 (0.919)	66 (0.880)	37 (0.822)	33 (0.971)	381 (0.872)
Total	184	81	86	54	62	75	45	34	437
φ_t, ρ_t, or τ_t selected[e]	25 (0.136)	18 (0.222)	20 (0.233)	9 (0.167)	9 (0.145)	10 (0.133)	4 (0.089)	3 (0.088)	73 (0.167)
φ_t, ρ_t, or τ_t equivalent[e]	31 (0.168)	10 (0.123)	4 (0.047)	3 (0.056)	6 (0.097)	7 (0.0933)	8 (0.178)	3 (0.088)	41 (0.094)
φ_t, ρ_t, or τ_t detected[e]	56 (0.304)	28 (0.346)	24 (0.279)	12 (0.222)	15 (0.242)	17 (0.227)	12 (0.267)	6 (0.176)	114 (0.261)
φ, ρ, and τ each time-independent[e]	128 (0.696)	53 (0.654)	62 (0.721)	42 (0.778)	47 (0.758)	58 (0.773)	33 (0.733)	28 (0.824)	323 (0.739)
Total	184	81	86	54	62	75	45	34	437

[a] One or more models with time-dependent survival had $QAIC_C$ more than 2.0 units lower than all models with time-independent survival.

[b] One or more models with time-dependent survival had $QAIC_C$ within 2.0 units of the time-independent survival model with the lowest $QAIC_C$.

[c] All models that fulfilled either of the above two conditions.

[d] All time-dependent survival models had $QAIC_C$ more than 2.0 units higher than the model with the lowest $QAIC_C$.

[e] Same as corresponding criteria above but applied to any parameter, φ_t, ρ_t, or τ_t.

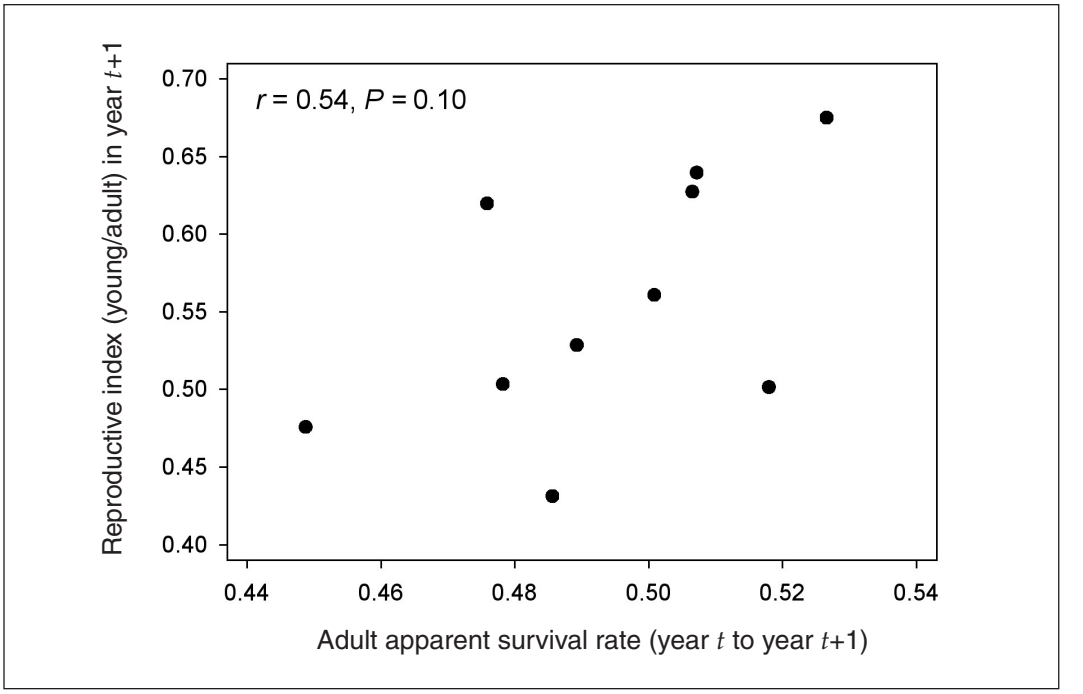

FIGURE 4. Scatterplot of the program-wide correlation between productivity in year *t*+1 and annual adult apparent survival rate from year *t* to year *t* +1 for all species pooled.

DISCUSSION

Useable MAPS data from 2002 and 2003 were received in time to be included in this report from 497 and 444 stations, respectively. Continuity of station operation remained high during 2002 (90.4%) but dropped during 2003 (79.2%). The sharp decrease in stations that occurred in 2003 (the first year ever during which the number of MAPS stations decreased) resulted primarily from the completion of several 8- to 10-yr contracts between IBP and various federal agencies; the number of independent stations (those not operated by IBP under federal contracts) decreased in 2003 by only seven stations. Although coverage of North America north of Mexico during 2002 and 2003 was generally widespread, there still were gaps, most notably in the Great Plains, Great Basin, southwest deserts, and most of Canada.

PATTERNS OF POPULATION SIZE AND PRODUCTIVITY

Adult population sizes for all species pooled and for many individual species *increased* substantially and significantly between 2001 and 2002 at the program-wide scale and in both the Northwest and Southwest regions. Similar, but generally non-significant increases were found in all of the remaining regions except the Alaska/Boreal Canada Region, where adult population sizes generally showed non-significant decreases. In sharp contrast, productivity for all species pooled and for many individual species *decreased* substantially and significantly between 2001 and 2002 at the program-wide scale and in all regions except the Alaska/Boreal Canada and South-central regions, where it tended to increase non-significantly.

The patterns of changes in both adult population size and productivity between 2002 and 2003 were nearly exactly reversed from those between 2001 and 2002. Thus, there were substantial and generally significant *decreases* in adult population size program-wide and in all regions except the Alaska/Boreal Canada and South-central regions, where adult populations tended to increase non-significantly. And, again in contrast to adult populations, there were substantial and significant *increases* in productivity program-wide and in the Southwest

Region, generally non-significant increases in productivity in four of the remaining regions, and generally non-significant decreases in productivity in the South-central and Southeast regions.

Thus, exactly out-of phase alternating patterns of changes in productivity and adult population size occurred program-wide and in the Northwest, Southwest, North-central, and Northeast regions, with increases in adults and decreases in productivity in 2002 followed by decreases in adults and increases in productivity in 2003. The same pattern also occurred in the Southeast Region, except that productivity continued to decline in 2003. Eighteen of the 24 changes in these five regions or at the program-wide scale were significant, either in terms of all species pooled or the proportion of species increasing or decreasing. The opposite pattern (decreases in adults and increases in productivity in 2002 and subsequent increases in adults and decreases in productivity in 2003) tended to occur in the two remaining regions, except that adults increased in 2002 in the South-central Region and productivity continued to increase in the Alaska/Boreal Canada Region in 2003, but none of the eight changes in these two regions were significant.

The pattern of regional changes in productivity often being followed by changes in adult population size of the same sign has been noted in previous MAPS reports (e.g., DeSante and Kaschube 2006). Indeed, 31 of 42 (74%; $P = 0.001$, binomial test) annual changes in reproductive index in the various regions during the 8-yr period 1996-2003 (when the size of the MAPS program was relatively stable at about 474 stations per year) were followed the next year in those regions by changes in adult population size that had the same sign. This same pattern also held at the program-wide scale over the entire 12 years (1992-2003; Fig. 3a-b), where 8 of 10 (80%; $P = 0.044$, binomial test; 6 of 6 since 1996) changes in productivity were followed the next year by changes in adult population size of the same sign. Moreover, the increasing and decreasing changes in productivity seen in MAPS data at the regional level often follow an alternating two-year cycle. These generally alternating, out-of-phase patterns in productivity and population size suggest density-dependent population regulation (Rodenhouse et al. 2003, Sillett et al. 2004) in which (a) increased productivity in a given year leads to increased population sizes the following year through increased recruitment of young birds, and (b) the increased population sizes suppress productivity through increased competition for food or other resources needed for reproduction. That these patterns of changes have not been consistent in all regions in all years suggests that density-independent factors may also drive changes in productivity and that other factors besides productivity (e.g., survival of young and adult birds) also drive year-to-year changes in adult population size.

SURVIVAL-RATE ESTIMATES

Increasing the number of years of data from 10 to 12 provided the following increases, all of which, perhaps, were expected: (a) the mean number of stations per region operated for at least four consecutive years (the minimum number of years necessary to be included in survivorship analyses) increased by an average of 15%, from 68 to 79 stations; (b) the mean number of years per region over which stations were operated increased by 10.5% from 6.97 to 7.70 years; and (c) the mean number of species per region that met selection criteria for survivorship analyses increased by an average of 5.4% from 59 to 62 species. Interestingly, however, the mean total number of adult captures per individual per species per region tended to decrease from 1.41 in the 10-yr data set to 1.38 in the 12-yr data set, as did the mean number of returns per individual adult per species per region, from 0.140 to 0.135. This, perhaps, suggests that survival rates (or recapture rates) might be declining. The increase in the length of the study and in the number of stations available for survivorship analyses (thus producing an increase in the total number of capture histories and the average number of years over which they were captured) resulted in a continued increase in the precision of the parameter estimates obtained from the mark-recapture analyses. Thus, the mean number of species per region with $CV(\varphi)<30\%$, $<20\%$, and $<10\%$ increased by 11% (from 46 species with 10 years of data to 51 species with 12 years of data), by 11% (from 36 to 40 species), and by 31% (from 16 to 21 species), respectively. These were considerably smaller increases than occurred when going

from seven to 10 years of data.

Again, as in previous years, a pattern of survivorship was detected in which mean regional annual adult survival probabilities tended to be lower at more northerly regions. This may well be an expected result due to the longer migration routes of more northerly nesting migratory species and the more severe winter weather faced by more northerly nesting permanent residents. Perhaps also as expected, the lowest survival rates at the highest latitudes (Alaska/Boreal Canada Region) appeared to be compensated by the highest productivity indices (0.747 for all species pooled in 2003), but this compensation did not always continue at lower latitudes where, for example, 2003 reproductive indices for all species pooled were higher in the South-central and Southeast than in the North-central and Northeast regions, respectively. Future analyses of MAPS data will test these hypotheses by modeling survival and productivity using latitude (and perhaps altitude) covariates.

Survival rates for better-estimated species were lower in each of the seven regions for the 12-yr, than for the 10-yr, data set, continuing the pattern noted in previous reports in which survival rates for better-estimated species in each of the seven regions tended to be lower for the 10-yr and 7-yr data sets than for the 7-yr and 5-yr data sets, respectively. The resulting conclusion that regional survival rates tended to be decreasing was confirmed, at least for all species pooled at the program-wide scale, by modeling survival both as time-dependent and as a linear function of time (year).

PROGRAM-WIDE, ALL-SPECIES-POOLED TRENDS IN POPULATION SIZE AND VITAL RATES

Chain indices of adult population size for all species pooled at the program-wide scale (Fig. 3a) have shown a severe and highly significant linear decline of -1.86% per year over the 12 years 1992-2003, resulting in a total decrease in population size of nearly 20%. It is important to note that vital rates (productivity and survival) do not need to be declining to result in a population decline. All that is needed is for productivity to be too low to balance mortality (or, stated alternatively, for survival to be too low to maintain a stable population in the face of a given productivity rate). However, program-wide results for all species pooled suggest that both productivity (Fig. 3b) and adult survival (Fig. 3c) declined, a situation that will make it increasingly difficult to reverse the population declines.

It is also interesting that survival from year t to year t+1 (measured from breeding season to breeding season) tends to be correlated with productivity in year t+1 (Fig.4). It seems likely that variations in annual survival may be driven by weather and habitat conditions on the wintering grounds (especially in late winter when food resources may be at a minimum), even in those situations for migratory species in which most mortality occurs during migration (Sillett and Holmes 2002). If so, then the correlation (albeit weak) shown in Fig. 4 suggests that some of the same factors that drive annual variations in survival might also drive variations in productivity, and that these factors may act during the non-breeding season. This is consistent with analyses of MAPS data that showed that annual variations in productivity of Nearctic-Neotropical migratory species breeding in the Pacific Northwest are driven by late-winter/early-spring weather conditions on their wintering grounds (Nott et al. 2002).

We point out that the results presented in Fig. 3c derive from the modeling of >319,000 individual adult capture histories, while the results presented in Figs. 3a and 3b derive from the analysis of >722,000 captures of >527,000 aged individuals. We hasten to add, however, that these results are based on pooling data from all species over all regions and, as such, likely obscure many important spatial patterns and individual species relationships. Indeed, as is clear from the results on individual species presented in Tables 1-3, there exists considerable variation among the vital rates (productivity and survival) of these many species. This presumably arises in response to such factors as body mass, life history strategy, migration strategy, nest location, and foraging behavior. Moreover the vital rates of these many different species are likely to be affected differently by various weather and habitat conditions, which in turn vary greatly over the different regions of the continent, within which the pool of species itself tends to differ. Considering all these sources of heterogeneity when data from all these species

are pooled over the entire continent, it is remarkable that such a consistent pattern of results emerges.

RECENT RESULTS AND CURRENT DIRECTIONS RELATED TO RESEARCH AND MANAGEMENT GOALS OF MAPS

One of the major goals of MAPS is to determine whether population declines are driven by processes affecting productivity or by processes affecting survival. BBS results demonstrate that the direction and intensity of population trends can vary dramatically from region to region; even species with overall declining populations often show increasing populations in some portions of their ranges (Sauer et al. 2007). This spatial variation in population trends provides a template for determining proximate demographic causes of declines. In a recent paper, Saracco et al. (in press) provide an example of such an analysis using 1992-2003 MAPS data for Yellow Warbler and recently-developed modeling techniques. They show that spatial variation in population trends in this species, as estimated by MAPS capture-recapture data, can largely be explained by spatial variation in adult and first-year survival, rather than by spatial variation in productivity. This inference was also supported by a spatial comparison of MAPS productivity indices and survival-rate estimates with BBS estimates of population trends for 15 BBS Physiographic Strata. We are in the process of completing similar analyses for other species in the MAPS database.

One of the greatest strengths of MAPS is that it provides spatially-explicit data on bird populations from across the continent. Yet, our ability to harness this spatial information has been hindered by a lack of appropriate analytical techniques. Through collaboration with researchers at the USGS Patuxent Wildlife Research Center in Laurel, MD, IBP researchers are making great strides in developing analytical methods that can provide visualizations of spatial patterns in demographic rates across species' ranges, including areas for which we currently have few (or no) MAPS stations. Over the next year we hope to develop these analyses further to incorporate BBS data in a 'joint model' to provide even more robust inferences regarding demographic causes of population trends in landbirds. If we are successful in rigorously linking MAPS and BBS data, we hope to apply similar techniques to link MAPS and the extensive spatially-explicit encounter data being amassed by the Avian Knowledge Network (http://avianknowledge.net).

Other major goals of MAPS are to (1) determine ultimate causes of the observed spatial variation in demographic parameters, by modeling them in relation to spatial variations in habitat and weather characteristics, (2) formulate management strategies based upon those models, and (3) evaluate the effectiveness of management action actually implemented in an adaptive management framework (Nott et al. 2003, 2005). To facilitate these goals in the Pacific Northwest, we have created a website (http://www.birdpop.org/usfsr6/usfspnwr6.htm) which presents results of GIS-based landscape-scale analyses of 16 years (1992-2007) of MAPS data on 45 stations operated on six national forests in Oregon and Washington (based on Nott et al. 2005) and provides decision support tools that allow land managers, in collaboration with GIS specialists, to assess the effects of management on the demographics of 13 landbird species of conservation concern.

Finally, the decrease in stations that occurred in 2003 is cause for concern. We suggest that the optimal way to maintain and grow the MAPS Program is by incorporating it into a comprehensive Coordinated Bird Monitoring (CBM) effort for North America (Bart and Ralph 2005). To begin this process we have begun integrating MAPS into Coordinated Bird Monitoring in the Northeast (USFWS Region 5, comprised of the 13 northeastern states south through West Virginia and Virginia) by a five-step process: (1) identifying target species for each Bird Conservation Region (BCR) based on their being listed as priority or focal species in the various Bird Conservation Plans and their being monitorable by MAPS; (2) determining how well each of the target species are currently being monitored by MAPS; (3) determining the effectiveness of all current and discontinued MAPS stations at monitoring the target species; (4) identifying geographic and habitat gaps in MAPS coverage; and (5) making recommendations for the role of the various federal and state agencies and private sector in continuing current stations, re-establishing discontinued stations, and establishing new stations to effectively monitor the target

species in each BCR. We look forward to implementing this process throughout the United States and southern Canada over the next few years in order to build and maintain an optimally effective continent-wide demographic monitoring program.

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LITERATURE CITED

BAILLIE, S. R. 1990. Integrated population monitoring of breeding birds in Britain and Ireland. Ibis 132:151-161.

BAILLIE, S. R., R. E. GREEN, M. BODDY, AND S. T. BUCKLAND. 1986. An Evaluation of the Constant Effort Sites Scheme. British Trust for Ornithology, Thetford, U.K. 103 pp.

BART, J., AND C. J. RALPH. 2005. The need for a North American coordinated bird monitoring program. Pp. 982-984 *in* Ralph, C.J., and T.D. Rich (eds.), Bird Conservation Implementation and Integration in the Americas. USDA Forest Service Gen. Tech. Rep. PSW-191.

BURNHAM, K. P., AND D. R. ANDERSON. 1992. Data-based selection of an appropriate biological model: the key to modern data analysis. Pp. 16-30 *in* McCullough, D. C. and R. H. Barrett (eds.), Wildlife 2001: Populations. Elsevier Applied Science, London, U.K.

BURNHAM, K. P., AND D. R. ANDERSON. 1998. Model Selection and Inference: a Practical Information Theoretic Approach. Springer-Verlag, New York, NY

CLOBERT, J., J. D. LEBRETON, AND D. ALLAINE. 1987. A general approach to survival rate estimation by recaptures or resightings of marked birds. Ardea 75:133-142.

COCHRAN, W. G. 1977. Sampling Techniques, Third Edition. John Wiley & Sons, New York, NY.

DESANTE, D. F. 1992. Monitoring Avian Productivity and Survivorship (MAPS): a sharp, rather than blunt, tool for monitoring and assessing landbird populations. Pp. 511-521 *in* McCullough, D. C., and R. H. Barrett (eds.), Wildlife 2001: Populations. Elsevier Applied Science, London, U.K.

DESante, D. F. 1995. Suggestions for future directions for studies of marked migratory landbirds from the perspective of a practitioner in population management and conservation. Journal of Applied Statistics 22:949-965.

DESANTE, D. F., AND K. M. BURTON. 1994. The Monitoring Avian Productivity and Survivorship (MAPS) Program third annual report (1992). Bird Populations 2:62-89.

DESANTE, D. F., K. M. BURTON, AND D. R. O'GRADY. 1996. The Monitoring Avian Productivity and Survivorship (MAPS) Program fourth and fifth annual report (1993 and 1994). Bird Populations 3:67-120.

DESANTE, D. F., K. M. BURTON, J. F. SARACCO, AND B. L. WALKER. 1995. Productivity indices and survival rate estimates from MAPS, a continent-wide programme of constant-effort mist netting in North America. Journal of Applied Statistics 22:935-947.

DESANTE, D. F., K. M. BURTON, P. VELEZ, D. FROEHLICH, AND D. KASCHUBE. 2007. MAPS Manual: 2007 Protocol. The Institute for Bird Populations, Point Reyes Station, CA.

DESANTE, D. F., K. M. BURTON, AND O. E. WILLIAMS. 1993b. The Monitoring Avian Productivity and

Survivorship (MAPS) Program second annual report (1990-1991). Bird Populations 1:68-97.

DeSante, D. F. and T. L. George. 1994. Population trends in the landbirds of western North America. *In* J. R. Jehl, Jr. and N. K. Johnson (eds.), A Century of Avifaunal Change in Western North America. Studies in Avian Biology 15:173-190.

DeSante, D. F., and D. R. Kaschube. 2006. The Monitoring Avian Productivity and Survivorship (MAPS) Program 1999, 2000, and 2001 report. Bird Populations 7:23-89.

DeSante, D.F., M.P. Nott, and D.R. Kaschube. 2005. Monitoring, modeling, and management: why base avian management on vital rates and how should it be done? Pp. 795-804 *in* Ralph, C.J., and T.D. Rich (eds.), Bird Conservation Implementation and Integration in the Americas. USDA Forest Service Gen. Tech. Rep. PSW-191.

DeSante, D. F., and D. R. O'Grady. 2000. The Monitoring Avian Productivity and Survivorship (MAPS) Program 1997 and 1998 report. Bird Populations 5:49-101.

DeSante, D. F., D. R. O'Grady, K. M. Burton, P. Velez, D. Froehlich, E. E. Feuss, H. Smith, and E. D. Ruhlen. 1998. The Monitoring Avian Productivity and Survivorship (MAPS) Program sixth and seventh annual report (1995 and 1996). Bird Populations 4:69-122.

DeSante, D. F., and D. K. Rosenberg. 1998. What do we need to monitor in order to manage landbirds? Pp. 93-106 *in* Marzluff, J. M. and R. Sallabanks (eds.), Avian Conservation: Research and Management. Island Press, Washington, DC.

DeSante, D. F., J. F. Saracco, D. K. O'Grady, K. M. Burton, and B. L. Walker. 2004. Methodological Considerations of the Monitoring Avian Productivity and Survivorship (MAPS) Program. Studies in Avian Biology 29:28-45.

DeSante, D. F., O. E. Williams, and K. M. Burton. 1993a. The Monitoring Avian Productivity and Survivorship (MAPS) Program: overview and progress. Pp. 208-222 *in* Finch, D. M., and P. W. Stangel (eds.), Status and Management of Migratory Birds. USDA Forest Service, Rocky Mt. Forest and Range Experimental Station, Ft. Collins, CO. General Technical Report RM-229.

Donovan, T. M., F. R. Thompson III, J. Faaborg, and J. R. Probst. 1995. Reproductive success of migratory birds in habitat sources and sinks. Conservation Biology 9:1380-1395.

Froehlich, D., N. Michel, D. F. DeSante, and P. Velez. 2006. MAPSPROG Version 4.1 User's Guide and Manual. The Institute for Bird Populations, Pt. Reyes Station, CA. 172 pp.

Hines, J. E., W. L. Kendall, and J. D. Nichols. 2003. On the use of the robust design with transient capture-recapture models. Auk 120:1151-1158.

Lebreton, J. -D., K. P. Burnham, J. Clobert, and D. R. Anderson. 1992. Modeling survival and testing biological hypotheses using marked animals: a unified approach with case studies. Ecological Monographs 62:67-118.

Marra, P. P., K. A. Hobson, and R. T. Holmes. 1998. Linking winter and summer events in a migratory bird by using stable-carbon isotopes. Science 282:1884-1886.

Noon, B. R. and J. R. Sauer. 1992. Population models for passerine birds: structure, parameterization, and analysis. Pp. 441-464 *in* Wildlife 2001: Populations. D. C. McCullough and R. H. Barrett (eds.), Elsevier Applied Science, London.

Nott, M. P., and D. F. DeSante. 2002. Demographic monitoring and the identification of transients in mark-recapture models. Pp. 727-736 *in* J. M. Scott and P. Heglund (eds.), Predicting Species Occurrences: Issues of Scale and Accuracy. Island Press, New York.

Nott, M. P., D. F. DeSante, R. B. Siegel, and P. Pyle. 2002. Influences of the El Niño/Southern Oscillation and the North Atlantic Oscillation on avian productivity in forests of the Pacific Northwest of North America. Global Ecology and Biogeography 11:333-342.

Nott, M. P., D. F. DeSante, and N. Michel. 2003. Management Strategies for Reversing Declines in Landbirds of Conservation Concern on Military Installations: A Landscape-scale Analysis of MAPS Data. Unpublished report to the U.S. Department of Defense Legacy Resource Management Program. The Institute for Bird Populations, Point Reyes Station, CA. 119 p.

Nott, M. P., D. F. DeSante, P. Pyle, and N. Michel. 2005. Managing Landbird Populations in Forests of the Pacific Northwest: Formulating Population management Guidelines from Landscape-scale Analyses of MAPS Data from Avian Communities on seven national Forests in the Pacific Northwest. Unpublished report to the National Fish and Wildlife Foundation and the USDA Forest Service, Northwest Region. The Institute for Bird Populations, Point Reyes Station, CA. 163 p.

Peach, W. J., S. T. Buckland, and S. R. Baillie. 1996. The use of constant effort mist-netting to measure between-year changes in the abundance and productivity of common passerines. Bird Study 43:142-156.

Peach, W. J., S. R. Baillie, and D. E. Balmer. 1998. Long-term changes in the abundance of passerines in Britain and Ireland as measured by constant effort mist-netting. Bird Study 45:257-275.

Pollock, K. H., J. D. Nichols, C. Brownie, and J. E. Hines. 1990. Statistical inference for capture-recapture experiments. Wildlife Monographs No. 107.

Pradel, R., J. Hines, J.-D. Lebreton, and J. D. Nichols.

1997. Capture-recapture survival models taking account of transients. Biometrics 53:60-72.

PULLIAM, H. R. 1988. Sources, sinks, and population regulation. American Naturalist 132:652-661.

ROBBINS, C. S., D. BYSTRAK, AND P. H. GEISSLER. 1986. The Breeding Bird Survey: Its First Fifteen Years, 1965-1979. U.S. Fish and Wildl. Serv., Resource Publication 157. 196 pp.

RODENHOUSE, N. L., T. S. SILLETT, P. J. DORAN, AND R. T. HOLMES. 2003. Multiple density-dependent mechanisms regulate a migratory bird population during the breeding season. Proceedings of the Royal Society London B 270:2105-2110.

SARACCO, J. F., D. F. DeSANTE, AND D. R. KASCHUBE. In press. Assessing landbird monitoring programs and demographic causes of population trends. Journal of Wildlife Management.

SAUER, J. R., J. E. HINES, AND J. FALLON. 2007. The North American Breeding Bird Survey, Results and Analysis 1966 - 2006. Version 10.13.2007. USGS Patuxent Wildlife Research Center, Laurel, MD.

SCHLAEPFER, M. A., M. C. RUNGE, AND P. W. SHERMAN. 2002. Evolutionary and ecological traps. Trends in Ecology and Evolution 17:474-480.

SILLETT, T. S., AND R. T. HOLMES. 2002. Variation in survivorship of a migratory songbird throughout its annual cycle. Journal of Animal Ecology 71:296-308.

SILLETT, T. S., RODENHOUSE, N. L., AND R. T. HOLMES. 2004. Experimentally reducing neighbor density affects reproduction and behavior of a migratory songbird. Ecology 85:2467- 2477.

TEMPLE, S. A., AND J. A. WIENS. 1989. Bird populations and environmental changes: can birds be bio-indicators? American Birds 43:260-270.

VAN HORNE, B. 1983. Density as a misleading indicator of habitat quality. Journal of Wildlife Management 47:893-901.

WHITE, G. C. 1983. Numerical estimation of survival rates from band-recovery and biotelemetry data. Journal of Wildlife Management 47:716-728.

WHITE, G. C., AND K. P. BURNHAM. 1999. Program MARK: Survival Estimation for Populations of Marked Animals. Bird Study 46 (Supplement): 120-138.

APPENDIX. Summary of 49 MAPS stations newly established in 2002, 52 stations newly established in 2003, and one station established prior to 2002 but not previously summarized in a MAPS annual report.

Stn. no.	Station name	Operator	Sponsor	Prov./ State	Nearest town	10′ block	Elev. (m)	Habitat(s)	First Year
I. Stations established before 2002									
SOUTH-CENTRAL REGION									
14518	Cottonwood Levee stand	D.Twedt	USGS/USFWS	MS	Fitler	323-0910	21	pulpwood managed cottonwd forest	94
II. Stations established in 2002									
NORTHWEST REGION									
11221	Jocko River	D.DeSante	USBIA-Flathead IR	MT	Ravalli	471-1141	825	cottonwood-willow riparian corridor	02
11222	Burns Bog	D.Matthews	Private	BC	Ladner	490-1225	10	mixed woodland/peat bog edge	02
11223	Garden Creek Nature Cent.	A.Holloran	Private - Goveners Youth	WY	Casper	424-1062	1609	riparian corr./prairie grassland	02
11224	Devil's Postpile NM	S.Heath	NPS - Small Parks Fund	CA	Mammoth Lakes	373-1190	2350	montane mead./lodgepole forest	02
11225	Wishbone	C.Smith	Parks Canada	AB	Waterton Park	490-1134	1300	cottonwood-wet shrub forest	02
11237	Oregon Caves	J.Alexander	?	OR	Cave Junction	420-1232	1597	riparian alder, mature mixed conifer	02
11238	McCarteney Creek	D.Stephens	TNC	WA	Ephrata	473-1194	503	water birch & aspen ripar. woodland	02
11248	Puget Sound Environ. LC.	D.Norman	Private - PSELC	WA	Winslow	473-1223	74	mature mixed conif decid. forest	02
11256	Ambrose Nature Study Ar.	J.Eidel	Bureau of Reclamation	NV	Carson City	390-1194	1402	cottonwood-willow riparian corridor	02
11257	Dayton State Park	J.Eidel	Bureau of Reclamation	NV	Dayton	391-1193	1341	cottonwood-willow riparian corridor	02
11260	Plaskett Meadows	C.Ralph	?	CA	Elk Creek	394-1225	1838	riparian/meadow	02
11261	Masterson Campground	C.Ralph	?	CA	Elk Creek	394-1225	1841	riparian	02
11262	Salmon Creek	C.Ralph	?	CA	Loleta	404-1241	3	riparian	02
SOUTHWEST REGION									
12321	Virgin River	M.Boyles	USNPS/ Clark County HCP	NV	Overton	363-1142	380	tamarisk-willow riparian corridor	02
12324	Delta (Carson River)	J.Eidel	Bureau of Reclamation	NV	Silver Springs	391-1190	1268	cottonwood-willow riparian corridor	02
12325	Gila River Farm	C.Fugagli	Private - T&E Inc.	NM	Gila	330-1083	1397	cottonwood-willow riparian corridor	02
12329	CO Riv. Delta/Lake Mead	J.Kahl, Jr.	USBR	AZ	Meadview	360-1135	360	willow & salt cedar along CO river	02
12334	Empire Canyon	K.Hughes	USBLM	AZ	Sonoita	314-1103	1384	young cotton-willow rip. w/ mesq.	02
12340	Indian Creek	J.Parrish	?	UT	Monticello	375-1093	1932	cottonwd-will rip. with oak&juniper	02
12341	Elk Ravine	M.van Hattem	Lawrence Livermore NL	CA	Tracy	373-1213	280	willow/elderberry riparian	02
12352	Lagunitas Creek	D.Humple	?	CA	Olema	380-1224	37	red alder-willow riparian	02
12353	Redwood Creek	D.Humple	?	CA	Muir Beach	375-1223	11	red alder-willow rip. -active resto.	02
12362	Leslie Canyon NWR	K.Voget	USFWS	AZ	McNeal	313-1093	1839	desert scrub/mesquite/grassland	02
12363	Ft Bowie Nat. Hist. Site	T.Wood	USNPS	AZ	Dos Cabezas	321-1092	1354	desert scrub/mesquite/grassland	02
NORTH-CENTRAL REGION									
13370	Merry Lea Farmstead	D.Miller	Private - Merry Lea	IN	Wolf Lake	411-0853	277	oldfield/woodlots/thickets/wetland	02
13371	Merry Lea Wilmer Mead.	D.Miller	Private - Merry Lea	IN	Wolf Lake	411-0853	275	oldfield/wet woodland/thickets	02
13375	Mormon Field Eight	F.Chavez-Ramirez	Private - Platte River Wh	NE	Grand Island	404-0982	579	post-hayed meadow	02
13376	Mormon Field Five	F.Chavez-Ramirez	Private - Platte River Wh	NE	Grand Island	?	579	tall grass prairie	02
13377	Mormon Field Nine	F.Chavez-Ramirez	Private - Platte River Wh	NE	Grand Island	?	579	tall grass prairie	02
13378	Mormon Field Six	F.Chavez-Ramirez	Private - Platte River Wh	NE	Grand Island	404-0982	579	rested native grassland	02
13379	Mormon Field Three	F.Chavez-Ramirez	Private - Platte River Wh	NE	Grand Island	404-0982	579	post-burn wet meadow	02
13380	Mormon Field Seven	F.Chavez-Ramirez	Private - Platte River Wh	NE	Doniphan	404-0982	579	managed mixed grass prairie	02

APPENDIX. Continued.

Stn. no.	Station name	Operator	Sponsor	Prov./ State	Nearest town	10′ block	Elev. (m)	Habitat(s)	First Year
13381	Wild Rose Big Slough	F.Chavez-Ramirez	Private - Platte River Wh	NE	Grand Island	404-0982	579	post-burn meadow	02
13382	Wild Rose Pit Meadow	F.Chavez-Ramirez	Private - Platte River Wh	NE	Grand Island	404-0982	579	hayed meadow	02
SOUTH-CENTRAL REGION									
14491	Cyprus Ford	J.Williamson	Private - Travis Audubon	TX	Austin	301-0973	134	cypress-willow riparian corridor	02
14492	Little Tank	J.Williamson	Private	TX	Refugio	282-0972	77	oak matt/pond/riparian corridor/field	02
NORTHEAST REGION									
15641	Hog Island	S.Weidensaul	?	ME	Round Pond	435-0692	33	mixed forest on island	02
15642	NSVAS - Blandy	R.Salmon	U of VA/Blandy Experim. F	VA	Boyce	390-0780	200	mixed hardwood/farmland/riparian	02
15643	Glendobbin	R.Salmon	Private	VA	Winchester	391-0780	300	mixed hardwood/farmland	02
15644	Purchase Knob	P.Super	USNPS-Great Smokies	NC	Maggie Valley	353-0830	1451	N. hardwood/fraser fir tree farm	02
15645	Ashuelot River Park	J.Atwood	Private	NH	Keene	425-0721	144	riparian deciduous forest	02
15646	Aton For.- Sandisfield Rd	S.Harms	Private - Aton Forest, In	CT	Norfolk	420-0730	435	N. hardwood/hemlock/beaver pond	02
15647	Punkhorn Parklands F. Sta	S.Finnegan	Private - French Foundati	MA	Brewster	414-0700	14	mixed woodland riparian corridor	02
15648	Constitution Marsh Sta. 1	E.Lind	Private - Audubon New Yor	NY	Cold Spring	412-0735	1	tidal wetl./alder swamp/mixed d. for.	02
15649	Kane Station	L.Doss	Marvelwood School/local c	CT	Kent	414-0732	396	swamp woodland/pasture	02
15650	Kaiser	E.Karnatz	Private-Braddock Bay Bird	NY	Hilton	431-0774	270	young ash woodland edge	02
15651	North Blind	E.Karnatz	Private-Braddock Bay Bird	NY	Hilton	431-0774	270	mature ash woodland on lake shore	02
SOUTHEAST REGION									
16702	Chassahowitaka WMA	A.Burrow	State - FL F&W Conservati	FL	Weeki Wachee	284-0823	14	flatwoods/sandhill and hardwd swmp	02
16703	Clemson Exp. Forerst #A	J.Camp	Private - Clemson Univers	SC	Clemson	343-0824	250	pine-hardwood forest	02
III. Stations established in 2003									
NORTHWEST REGION									
11232	Schall	D.DeSante	USBIA-Flathead IR	MT	Ravalli	471-1140	870	cottonwood-willow riparian corridor	03
11233	Spring Creek	D.DeSante	USBIA-Flathead IR	MT	Ravalli	471-1140	853	cottonwood-willow riparian corridor	03
11234	Woodpecker Haven	D.DeSante	USBIA-Flathead IR	MT	Arlee	471-1140	920	cottonwood-willow riparian corridor	03
11235	Jackson Campus	D.Wachob	Teton Science School	WY	Jackson	432-1104	1862	cottonwd-willow woodl./restored pd.	03
11239	Royal Roads University	A.Nightingale	Dept. National Defence fo	BC	Victoria	482-1232	10	2nd growth for.& naturalized ag land	03
11240	Rocky Point Bird Observ.	A.Nightingale	Dept. National Defence fo	BC	Victoria	481-1233	15	2nd growth for.& naturalized ag land	03
SOUTHWEST REGION									
12330	Fort Hunter Liggett #2	D.Woodbury	USARC - Army Reserve Corp	CA	Jolon	355-1210	240	cottonwood-willow riparian corridor	03
12331	Colorado River	O.Hinojosa-Huerta	Pronatura Sonora	SO	San Luis Rio Colorado	321-1150	20	cottonwood-willow riparian corridor	03
12332	Coyote Spring	S.Cox	USE - Department of Energ	NM	Albuquerque	350-1062	2000	open pinyon-juniper woodland	03
12333	Lewis Center	B.Deppe	Lewis Center	CA	Apple Valley	343-1171	885	cottonwood-willow riparian corridor	03
12336	All Saints Schulte	J.Griffiths	Monterey Peninsula Water	CA	Carmel	363-1214	30	restored cottonwd-willow coastal rip.	03
12337	Carmel Middle School	J.Griffiths	Carmel Middle School	CA	Carmel	363-1215	18	coastal scrub/restored willow rip.	03
12338	Rancho San Carlos	J.Griffiths	Monterey Peninsula Water	CA	Carmel	363-1215	16	cottonwd-will. coastal rip.	03
12339	Red Rocks	J.Griffiths	Monterey Peninsula Water	CA	Carmel	363-1214	30	restored cottonwd-willow coastal rip.	03
12342	Cibola NWR - Nat. Trail R	J.Kahl, Jr.	USBR	AZ	Cibola	332-1144	70	restoration cottonwd, willow, mesq.	03
12354	Livermore Marsh	D.Jones	Private - Audubon Canyon	CA	Marshall	381-1225	6	coastal willow riparian	03

APPENDIX. Continued.

Stn. no.	Station name	Operator	Sponsor	Prov./ State	Nearest town	10′ block	Elev. (m)	Habitat(s)	First Year
NORTH-CENTRAL REGION									
13373	Beaver Creek Reserve FRS	B.Steger	County/private - Friends	WI	Fall Creek	444-0911	295	mixed woodl./floodpln/restored prair	03
13383	Field One	F.Chavez-Ramirez	Private - Platte River Wh	NE	Alda	404-0982	602	tallgrass prairie	03
13384	North Meadow	F.Chavez-Ramirez	Private - Platte River Wh	NE	Alda	404-0982	602	tallgrass prairie	03
13385	Crane Meadows	F.Chavez-Ramirez	Private - Platte River Wh	NE	Alda	404-0982	602	tallgrass prairie	03
13386	Mormon Island Fld Eleven	F.Chavez-Ramirez	Private - Platte River Wh	NE	Grand Island	404-0982	602	tallgrass prairie	03
13387	Office Pasture	F.Chavez-Ramirez	Private - Platte River Wh	NE	Alda	404-0982	602	tallgrass prairie	03
13388	Mormon Island Field Four	F.Chavez-Ramirez	Private - Platte River Wh	NE	Grand Island	404-0982	602	tallgrass prairie	03
13390	Goose Island	M.Meier	USGS	WI	La Crosse	434-0911	194	?	03
13391	Governors St. Un. Bird Ob	R.Baisa	State - Governors St.Univ	IL	University Park	412-0874	233	oldfield and dense shrub	03
SOUTH-CENTRAL REGION									
14494	Bradford Cemetery	D.DeSante	USDoD	MO	Big Piney	374-0920	317	black walnut plantation	03
14495	Tilley Bottoms	D.DeSante	USDoD	MO	Waynesville	374-0921	250	oldfield/oak forest	03
14502	Comp.4, patch cut & Thin	D.Twedt	USGS/USFWS	LA	Delhi	322-0912	21	oak-gum bottomland for.: 2000 harv.	03
14503	Comp.4, thinning Harvest	D.Twedt	USGS/USFWS	LA	Delhi	322-0912	21	oak-gum bottomland for.: 2000 harv.	03
14504	Comp.4, unharv. control	D.Twedt	USGS/USFWS	LA	Delhi	322-0912	21	oak-gum bottomland forest	03
14505	Comp.9, patch cut & Thin	D.Twedt	USGS/USFWS	LA	Delhi	322-0912	21	oak-gum bottomland for.: 2000 harv.	03
14506	Comp.9, thinning Harvest	D.Twedt	USGS/USFWS	LA	Delhi	322-0912	21	oak-gum bottomland for.: 2000 harv.	03
14507	Comp.9, unharv. control	D.Twedt	USGS/USFWS	LA	Delhi	322-0912	21	oak-gum bottomland forest	03
14508	Choctaw Island WMA	C.Rideout	AR Game & Fish Commission	AR	Arkansas City	333-0911	40	Lower Miss. River batture	03
NORTHEAST REGION									
15654	Golf Course	D.DeSante	USDoD	ME	Brunswick	435-0695	13	balsam fir/boggy deciduous forest	03
15655	Chimney Rock	D.DeSante	USDoD	ME	Brunswick	435-0695	18	maple-oak deciduous forest/riparian	03
15656	Redington Pond	D.DeSante	USDoD	ME	Dallas	445-0702	507	mixed decid.-evergreen forest/pond	03
15657	Potato Nubble	D.DeSante	USDoD	ME	Dallas	445-0703	488	mixed decid.-evergreen for./shrubld	03
15658	Blueline Trail	D.DeSante	USDoD	ME	Dallas	445-0702	515	balsam-red spruce forest/rip./alder	03
15659	Highland	D.DeSante	USDoD	ME	Dallas	450-0702	724	stunted balsam-red spruce for./boggy	03
15660	Pardon Gray	G.Albanese	Private - MA Audubon, Par	RI	Tiverton	413-0711	65	Oak-holly for./maple swamp/grassl.	03
15661	Buffalo Aud. Arboretum	W.Michalek	Private - Buffalo Audubon	NY	North Java	424-0782	442	successional hardwd./manage mead	03
15663	Thousand Acre Swamp	C.Marino	Private	NY	Penfield	431-0772	152	mixed decid. for./swamp/brushy area	03
15668	Holland College	D.Martin	Private - Holland College	PE	Orwell	461-0625	200	mid-successional mixed woodland	03
SOUTHEAST REGION									
16706	Sandstone Hill	D.DeSante	USDoD-Legacy/Fort Bragg	NC	Ashley Heights	350-0791	152	pine savana/mixed woodland	03
16708	Clark's River NWR #1	H.Chambers	USFWS	KY	Benton	365-0882	102	bottomland hardwd/post oak prairie	03
16709	Buford St. Fish Hatchery	R.Trump	Hummer Bird Study Group	GA	Cumming	340-0840	272	Mixed woodland/ Chattahoochee rip.	03
16710	Tibwin Plantation	S.Lohr	USFS	SC	McClellanville	330-0793	3	maritime forest thickets/field edge	03
16711	Powhatan	D.Reilly	Private - Richmond Audubo	VA	Powhatan	373-0780	73	mixed decid. woodland/scrub/field	03
16714	Natural Bridge	J.Weese	State - KY St. Nature Pre	KY	Slade	374-0834	245	hemlock-mixed mesophytic forest	03
16721	Banshee Reeks	M.Koeneke	County - Loudon Co Dept o	VA	Leesburg	390-0773	117	decid. woodlands/successional fields	03
16725	Clemson Exp. Forerst #B	J.Camp	Private - Clemson Univers	SC	Clemson	?	9999	?	03