IDENTIFYING CAUSES OF POPULATION CHANGE IN MIGRATORY BIRDS:

PHASE I PROGRESS REPORT

Data preparation, vital rate estimation, and description of spatial patterns in MAPS and BBS data

Funded under NFWF Project No. 2005-0260-000

August 31, 2006

James F. Saracco[1], Danielle R. Kaschube, and David F. DeSante

The Institute for Bird Populations
11435 State Route One, Suite 23
P.O. Box 1346
Point Reyes Station, CA 94956-1346

[1] Phone: 415-663-2054, E-mail: jsaracco@birdpop.org

We are pleased to report that objectives for Phase I of *Identifying Causes of Population Change in Migratory Birds* have been met, and we are set to begin the second phase of this project. Specifically, we have (1) received, verified, and prepared the 12-year 1992-2003 Monitoring Avian Productivity and Survivorship (MAPS) data base for analyses; (2) calculated MAPS productivity indices, estimated adult apparent survival rates, and estimated North American Breeding Bird Survey (BBS) population trends for 183 landbird species at the continental scale; and (3) indexed or estimated vital rates for 39 target species, 28 of which show evidence of long-term range-wide declines (Table 1), at the scales of (a) North American Bird Conservation Initiative (NABCI) Bird Conservation Regions, BCRs, (http://www.nabci-us.org/bcrs.html), and (b) BBS Physiographic Strata (Robbins et al. 1986; http://www.mbr-pwrc.usgs.gov/bbs/physio.html). BBS trends were also estimated for these 39 target species at the scale of BBS physiographic strata; we did not estimate BBS trends within BCRs, as estimates at that spatial scale and time period of interest (1992-2003) are not currently available. MAPS results for the 12-year data set at a spatial scale intermediate between continental and BCR scales (that of the 'MAPS Region') will be reported in the next issue of *Bird Populations*. For the sake of brevity, we do not include them here.

In addition to reporting initial estimates of population parameters, we briefly summarize overall spatial and temporal patterns found in MAPS data, provide initial insights into links between vital rates and population change, and show an example of exploratory analyses that call on spatial interpolation techniques to produce 'continuous-space' maps of MAPS productivity indices. We leave further development of spatial modeling of population parameters and linking of vital rates and trends until Phase II of the project, during which time we will be working closely with J. Andy Royle of the USGS Patuxent Wildlife Research Center to develop more appropriate and robust Bayesian analytical techniques. Below we provide a brief summary of Phase I activities.

Data receiving, verification, and preparation for analyses

Between August 8, 2005 and March 31, 2006, outstanding data from 22 MAPS stations that were operated in 2002 and 39 stations that were operated in 2003 were received and digitized. Computer entry of all banding data was completed by John W. Shipman of Zoological Data Processing, Socorro, NM. Entry of effort and breeding status data was completed by IBP biologists. During this time, 322 station-years of MAPS data (154 stations from 2002 and 168 stations from 2003) were verified to complete preparation of the twelve-year (1992-2003) MAPS data set. Critical data for each banding record (capture code, band number, species, age, sex, date, capture time, station, and net number) were proofed by hand against the raw data and any computer-entry errors were corrected. Digitized data were run through a series of verification programs, including:

(1) clean-up programs that check the validity of all codes entered and the ranges of numerical information in all banding, effort, winter residency, and HSA data;
(2) cross-check programs that compare station, date, and net information in the banding and effort data;

(3) within-banding-record verification programs that compare species, age, and sex determinations against molt limit and plumage characteristics, degree of skull pneumaticization, and extent of body and flight-feather molt and primary-feather wear;
(4) between-banding-record verification programs that screen banding and recapture data from all days of operation for inconsistent species, age, or sex determinations for each band number; and
(5) screening programs that identify unusual or duplicate band numbers or unusual band sizes for each species.

Discrepancies or suspicious data identified by any of these programs were examined and corrected if necessary. Wing chord, body mass, station of capture, date, and pertinent notes were used as supplementary information to correct errors in species, age, and sex determinations.

Methods: estimation and indexing of population parameters

The complete verified 12-yr data MAPS data set included data usable for survival or productivity analyses from 840 MAPS stations operated for 4,632 station-years (Table 2). For analyses reported here, we only used data collected between May 1-August 8 (i.e., the normal MAPS banding period) of each year. For survival analyses, we included all individuals of a species at a station if the species was found to be a regular or usual breeder at that station (i.e., if the species bred within station boundaries on > 1/2 of the years that the station was operated). For analyses of adult and young captures and productivity, we also included data for a species at stations that were located within the species' breeding range but where the species did not ordinarily breed (i.e., where the species was 'transient'). We do not include, in any analyses, data for a species at a station that was outside of the species' breeding range or at an altitude at which the species does not breed.

We calculated "time-constant" indices of adult population size, young (i.e., "hatching-year") population size, and productivity (PI) for each species and station by averaging the numbers of adults captured per 100 net-hours, young captured per 100 net-hours, and the proportion of young to adult birds in the catch, respectively. Summaries at larger spatial scales (BBS Physiographic Strata, BCRs, and continent-wide) represent weighted averages, where station-level means are weighted by the number of years that the station was operated. Although it has been argued that capture rate and productivity indices from mist-netting studies could lead to a biased view of population parameters (e.g., Sauer and Link 2004), several lines of evidence suggest that this is not generally the case. First, our indices of adult population size compare favorably to estimates of adult population size derived by dividing numbers of adults captured by estimates of recapture probability (as described in Williams et al. 2002: 244; see Dugger et al. 2004 for an application). For example, these two measures of adult population size at the scale of BBS strata were strongly correlated for nearly all of our 37 target species; the average correlation coefficient (r) for the 39 target species was 0.63, and more than half had $r > 0.80$. Furthermore, other studies have shown capture rates to be positively correlated with other measures of abundance, and indices of productivity are often positively correlated with local or regional nest success (Dunn and Ralph 2004). Thus, we feel that these metrics provide very useful information about population patterns and processes.

We estimated annual adult apparent survival rates (ϕ), adult recapture probabilities (p), and the proportions of residents of birds seen once in year they were banded (τ), using modified Cormack-Jolly-Seber capture-recapture models. Specifically, we used the *ad hoc* Robust Design model described by Nott and DeSante (2002) and Hines et al. (2003). We provide parameter estimates from "time-constant" models; however we also compared the fit of these time-constant models to that of models that allowed parameters to vary by year. We were particularly interested in exploring temporal variation in adult apparent survival rates. For these capture-recapture models, we only included data from stations that operated for at least four contiguous years during the study period. If a year was missed (or did not have sufficient effort to be used) for a station that was operated during 4+ contiguous years, the longest contiguous segment of data was retained for analyses (this only resulted in dropping data from three stations). For stations that stopped operating prior to 2003, records from the last year of operation were marked as lost on capture (i.e., they were removed from the sample). All capture-recapture models were implemented using the computer program TMSURVIV (http://www.mbr-pwrc.usgs.gov/software.html).

BBS estimates of population trend were obtained from the BBS website (Sauer et al. 2005) using the estimating equations approach of Link and Sauer (1994). We only provide estimates at this time for the continental and BBS-strata scales.

Results: estimates and indices of population parameters at multiple spatial scales

Continental-scale indices and estimates of MAPS population parameters and BBS trends for 183 species are presented in Table 3. This list represents all landbird species for which estimates and indices could be attained. More than 1/3 of these species had significantly ($P < 0.05$) declining BBS trends during the study period; just 15% significantly increased. The large number of declining species is much greater than would be expected by chance and reinforces the urgent need to identify demographic and environmental causes of population declines. The precision of MAPS continental-scale adult apparent survival rate estimates was, for the most part, excellent (median CV = 11%). These MAPS and BBS continental-scale estimates and indices will provide a useful benchmark for comparing metrics calculated at the smaller spatial scales.

A summary of MAPS population parameters for 39 target species at the scale of BCRs is presented in Table 4. Although coverage varied widely among regions, we were able to obtain reasonable estimates of capture-recapture parameters and indices of population sizes and productivity for an average of eight regions per target species. Population parameters varied markedly among regions. For example, survival rate estimates varied nearly five-fold for Bullocks Orioles between the region of its lowest survival-rate estimate (Lower Great Lakes/St Lawrence Plain; $\phi = 0.155$) and that of its highest survival-rate estimate (Prairie Hardwood Transition; $\phi = 0.755$). A logistic analysis comparing productivity (young to adult captures) among BCRs (stations used as replicates, weighted by number of years of operation) showed statistically significant ($P < 0.001$) differences among regions for all target species, although the amount of variation accounted for by these models was small (R^2 averaged 0.03 for the 39 analyses).

We present vital rate and population trend data for target species at the scale of BBS strata with 39 four-paneled figures (Figs. 1-39). The first (top left) panel of each figure represents the

summer distribution of each species and the locations of MAPS stations where that species was captured. Symbols for MAPS stations are scaled to represent the number of years of operation. The smallest symbols show stations only used for capture-rate and productivity analyses; stations represented by larger symbols contained sufficient data for survival analyses. The remaining panels illustrate spatial variation in population parameter values among BBS strata. We included all strata for which we were able to obtain *both* BBS and MAPS estimates and indices. In some cases (as can be gleaned from the maps showing the distributions of MAPS stations), MAPS data were sparse for particular regions (in a few cases just one or two stations were operated). In addition, these figures do not indicate variability in parameter estimates. Thus, although useful for exploratory purposes, care should be taken in the interpretation of these maps.

The relationship between vital rates and population trend was fairly evident for a number of species presented in Figures 1-39. For example, the highest apparent survival rates closely matched patterns of the most positive population trends for several species, including "Western" Flycatcher (Fig. 7), Orange-crowned Warbler (Fig. 17), Prothonotary Warbler (Fig. 23), Worm-eating Warbler (Fig. 24), and Bullock's Oriole (Fig. 36). Weighted linear regressions (weights = 1/BBS trend variance estimates) between adult apparent survival rate and population trend reinforced this relationship for Worm-eating Warbler and Bullock's Oriole ($R^2 = 0.44$ and 0.45 respectively; $P < 0.05$). Linear effects of survival on trend were significant or nearly so ($P < 0.10$) for an additional four species: Gray Catbird, Yellow Warbler, Hooded Warbler, and Lazuli Bunting. Visual inspection of Figures 1-39 and/or linear regressions suggested a relationship between productivity and trend at the scale of BBS strata for a few species, including Eastern Wood-Pewee (Fig. 2), "Traill's" Flycatcher (Fig. 4), Lazuli Bunting (Fig. 35), and Baltimore Oriole (Fig. 39).

A consideration of overall patterns depicted in Figures 1-39 suggest that bird populations are doing fairly well in some regions but poorly in others. In order to quantify overall spatial patterns, we standardized BBS-stratum scale productivity indices, adult survival-rate estimates, and BBS trend estimates to mean zero and unit variance for each target species and then used these standardized values as replicates to test whether population metrics were consistently above or below standardized mean values for each strata. Results of this exercise are enumerated in Table 5. In general, there was little overlap among strata that had deficiencies in productivity, those that had low survival, and those that had the most negative population trends. Productivity tended to be lowest in southeastern and western interior regions, survival deficiencies showed no particular geographic pattern, and BBS trend deficiencies were concentrated primarily in eastern strata. The one exception to the apparent spatial segregation of deficiencies of the three metrics was the Northern New England stratum, for which all three metrics were significantly negative.

Temporal variation in MAPS vital rates

We found little evidence of temporal variation in adult apparent survival at any spatial scale. At the continental scale, models that included time dependence in adult apparent survival rates were selected as the best competing models (Based on AIC_c; see Burnham and Anderson 1998) in just 18 (10%) of 184 species; models with time-varying survival rates were among the top three models in just 30 (16%) of these species. At the scales of BCRs and BBS Physiographic Strata, models that included time-varying survival rates were selected as among the top three in just

over 6% of species-region combinations (considering all species-region combinations for which we were able to obtain estimates; i.e., not just target species). It is possible that there were linear trends in survival; however, we have not yet attempted such analyses.

We did, however, test for continental-scale trends in productivity for all species for which we had data in each of the 12 years using weighted logistic regression. Response variables were the logit-transformed proportions of young to adult birds captured program-wide in each year, and weights were the numbers of stations operated in each year. Results of these analyses indicated significant ($P < 0.05$) trends (i.e., "year effects") in productivity for 147 of 174 species. It should be noted however, that although trends were statistically-significant, they explained little of the overall variation in productivity (the largest R^2 value for the 174 species was just 0.039 and averaged just 0.006). Productivity of 86 of the 147 species that exhibited significant trends was increasing, while productivity of 61 species declined. We will explore temporal patterns in productivity at finer spatial scales as the project develops further (also see spatio-temporal patterns in productivity below).

Spatio-temporal patterns in productivity

As an example of some of the ways we have been using spatial interpolation techniques to examine spatio-temporal patterns in productivity, we present kriged maps (see Cressie 1993 for an overview of kriging) of Wood Thrush productivity during four years with relatively consistent effort (Fig. 40). To produce these maps, we used tools available in the Geostatistical Analyst toolbox of ArcGIS (Johnston et al. 2001). We began by examining and modeling (if necessary) spatial trends with polynomial regressions and then modeling the small-scale (i.e., residual) spatial variance with theoretical semivariogram models (we used spherical semivariogram models for the examples here). For each of the years, we examined at least four models that varied with respect to whether trends were modeled or not (and what degree polynomial was used), whether anisotropic or isotropic semivariograms were used, and the number of lag classes considered. We present results for the best model in each case (as determined by cross-validation and the resulting comparison of mean prediction errors, root-mean-square errors, average standard errors, and root-mean-square standardized errors among models). We do not conduct a rigorous assessment of model fit here.

Plots such as these (Fig. 40) are giving us a better picture of spatial variation in productivity for a variety of species. In this Wood Thrush example, it is clear that productivity was highly variable among years at the level of individual stations. Furthermore, the interpolated surfaces highlight larger-scale patterns of annual variation – a southeast-northwest gradient in 1995-1996 shifting to more even productivity by 1998. Because of the statistical complexity of estimating survival rates and other population parameters using capture-recapture models, we have been unable to produce similar maps for survival. Furthermore, kriging does not easily allow for the incorporation of sampling variances and environmental variables that would improve prediction. As indicated earlier, in collaboration with the USGS Patuxent Wildlife Research Center, we are developing Bayesian techniques of spatial prediction that will address both of these problems.

Summary

We are pleased with the progress of the project to date. The completion of data entry and verification of 12-yrs of data marks a major milestone in the MAPS program. We show that MAPS vital rates and BBS population trends, as summarized at multiple spatial scales, vary markedly across space. The urgency of understanding this variation, and identifying proximate and ultimate causes of population change, is highlighted by the large number of species that have recently declined. The initial summaries, parameter estimates, and exploratory analyses reported here provide a sound foundation for the next phase of the project. We look forward to the next round of analyses and the subsequent development of effective management and conservation strategies for migratory landbirds.

Acknowledgements

We are extremely grateful for the continued support of the National Fish and Wildlife Foundation. We are deeply indebted to the many biologists, interns, volunteers, independent bird banders, and funding agencies that have enabled the amassment of the huge data base necessary to undertake this project.

Literature Cited

Burnham, K. P., and D. R. Anderson. 1998. Model Selection and Inference: A Practical Information-Theoretic Approach. Springer-Verlag, New York.

Cressie, N. A. C. 1993. Statistics for Spatial Data. John Wiley and Sons, New York.

Dunn, E. H., and C. J. Ralph. 2004. Use of mist nets as a tool for bird population monitoring. *In:* Monitoring Bird Populations Using Mist Nets (C. J. Ralph and E. H. Dunn, Editors). Studies in Avian Biology 29:1-6.

Hines, H. 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.

Johnston, K., J. M. Ver Hoef, K. Krivoruchko, and N. Lucas. 2001. Using ArcGIS Geostatistical Analyst. ESRI, Redlands, CA.

Link, W. A., and J. R. Sauer. 1994. Estimating equations estimates of trend. Bird Populations 2:23-32.

Nott, M. P. and D. F. DeSante. 2002. Demographic monitoring and the identification of transients in mark-recapture models. Pages 727-736 in J. M. Scott, P. J. Heglund, and M. L. Morrison (eds.), Predicting species occurrences: issues of accuracy and scale. Island Press, Washington, D.C.

Robbins, C. S., D. Bystrak, and P. H. Geissler. 1986. The Breeding Bird Survey: its first fifteen years, 1965-1979. U.S. Fish and Wildlife Service Resource Publication No. 157. 196 pp.

Sauer, J. R., J. E. Hines, and J. Fallon. 2005. The North American Breeding Bird Survey, Results and Analysis 1966 - 2004. Version 2005.2. USGS Patuxent Wildlife Research Center, Laurel, MD.

Sauer, J. R., and W. A. Link. 2004. Some consequences of using counts of birds banded as indices to populations. *In:* Monitoring Bird Populations Using Mist Nets (C. J. Ralph and E. H. Dunn, Editors). Studies in Avian Biology 29:168-172.

Williams, B. K., J. D. Nichols, and M. J. Conroy. 2002. Analysis and Management of Animal Populations. Academic Press, San Diego, CA.

Table 1. Nearctic-Neotropical migratory landbird species targeted by the project *Identifying Causes of Population Declines in Migratory Birds* and their long-term (1966-2003) population trends, as determined from North American Breeding Bird Survey (BBS) data (Sauer et al 2005).

Species	Distribution [1]	1966-2003 BBS trend [2]
Western Wood-Pewee (*Contopus sordidulus*)	W	-1.3**
Eastern Wood-Pewee (*C. virens*)	E	-1.8**
Acadian Flycatcher (*Empidonax virescens*)	E	-0.1
"Traill's" (Alder/Willow) Flycatcher (*E. alnorum/trailii*)	C	-0.1
Hammond's Flycatcher (*E. hammondii*)	W	1.1
Dusky Flycatcher (*E. oberholseri*)	W	-1.3*
"Western" (Pacific-slope/Cordilleran) Flycatcher (*E. difficilis/occidentalis*)	W	-0.5
White-eyed Vireo (*Vireo griseus*)	E	0.3
Bell's Vireo (*V. bellii*)	W	-2.9**
Warbling Vireo (*V. gilvus*)	W	1.2**
Red-eyed Vireo (*V. olivaceus*)	E	1.3**
Veery (*Catharus fuscescens*)	E	-1.4**
Swainson's Thrush (*C. ustulatus*)	C	-0.5
Wood Thrush (*Hylocichla mustelina*)	E	-1.8**
Gray Catbird (*Dumetella carolinensis*)	C	-0.1
Blue-winged Warbler (*Vermivora pinus*)	E	-0.6
Orange-crowned Warbler (*V. celata*)	W	-1.2**
Yellow Warbler (*Dendroica petechia*)	C	0.4**
Chestnut-sided Warbler (*D. pensylvanica*)	E	-0.6
Prairie Warbler (*D. discolor*)	E	-2.0**
Black-and-white Warbler (*Mniotilta varia*)	E	-0.3
American Redstart (*Setophaga ruticilla*)	E	-0.5
Prothonotary Warbler (*Protonotaria citrea*)	E	-1.5*
Worm-eating Warbler (*Helmitheros vermivora*)	E	0.5
Ovenbird (*Seiurus aurocapilla*)	E	0.5**
Louisiana Waterthrush (*S. motacilla*)	E	0.8*
Kentucky Warbler (*Oporornis formosus*)	E	-1.0**
MacGillivray's Warbler (*O. tolmiei*)	W	-0.5
Common Yellowthroat (*Geothlypis trichas*)	C	-0.3*
Hooded Warbler (*Wilsonia citrina*)	E	0.8
Wilson's Warbler (*W. pusilla*)	W	-1.4**
Yellow-breasted Chat (*Icteria virens*)	C	0.0
Chipping Sparrow (*Spizella passerina*)	C	-0.2
Black-headed Grosbeak (*Pheucticus melanocephalus*)	W	0.7
Lazuli Bunting (*Passerina amoena*)	W	0.6
Indigo Bunting (*P. cyanea*)	E	-0.6**
Painted Bunting (*P. ciris*)	E	-2.0**
Bullock's Oriole (*Icterus bullockii*)	W	-1.0**
Baltimore Oriole (*I. galbula*)	E	-0.7**

[1] W = primarily western North America; E = primarily eastern North America; C = continent-wide.

2 * $P < 0.05$; ** $P < 0.01$.

Table 2. Number of Monitoring Avian Productivity and Survivorship (MAPS) stations included in the 1992-2003 data base and the number of years that they were operated.

No. years of operation	No. stations
1	136
2	91
3	77
4	78
5	101
6	44
7	47
8	47
9	54
10	44
11	52
12	64

Table 3. Summary of population parameters at the continental scale derived from the Monitoring Avian Productivity and Survivorship (MAPS) Program and the North American Breeding Bird Survey (BBS) for the 12-yr period 1992-2003. **Bolded** species had significantly ($P < 0.05$) declining populations during the study period. *Italicized* species significantly increased.

	MAPS captures and productivity index[2]					MAPS survival[3]			BBS trends[4]		
Species[1]	Nsta	Nsta-yrs	Adults(SE)	Yng.(SE)	PI(SE)	Nsta	Nind	ϕ(SE)	Nrtes	Trend(SE)	P-value
Common Ground-Dove	19	56	2.30(0.63)	0.44(0.17)	0.10(0.04)	10	479	0.453(0.154)	175	0.86(0.99)	0.38247
Yellow-billed Cuckoo	**143**	**354**	**0.42(0.02)**	**0.03(0.00)**	**0.04(0.01)**	**95**	**603**	**0.480(0.098)**	**1373**	**-2.65(0.38)**	**0.00000**
Belted Kingfisher	**33**	**54**	**0.25(0.03)**	**0.18(0.03)**	**0.37(0.11)**	**9**	**28**	**0.299(0.174)**	**1301**	**-1.56(0.65)**	**0.01692**
Acorn Woodpecker	*21*	*41*	*0.38(0.06)*	*0.04(0.03)*	*0.15(0.12)*	*11*	*70*	*0.463(0.177)*	*114*	*1.75(0.85)*	*0.04269*
Golden-fronted Woodpecker	*12*	*43*	*0.93(0.29)*	*0.26(0.07)*	*0.39(0.12)*	*7*	*145*	*0.179(0.115)*	*73*	*3.50(0.90)*	*0.00025*
Red-bellied Woodpecker	*163*	*421*	*0.26(0.01)*	*0.08(0.01)*	*0.18(0.02)*	*101*	*429*	*0.423(0.079)*	*1429*	*1.22(0.26)*	*0.00000*
Williamson's Sapsucker	44	132	0.32(0.04)	0.12(0.02)	0.23(0.06)	14	189	0.382(0.095)	69	3.58(2.68)	0.18746
Yellow-bellied Sapsucker	*41*	*102*	*0.40(0.04)*	*0.09(0.02)*	*0.22(0.08)*	*16*	*143*	*0.486(0.098)*	*564*	*3.06(0.92)*	*0.00102*
Red-naped Sapsucker	**81**	**340**	**0.50(0.03)**	**0.20(0.02)**	**0.34(0.03)**	**35**	**616**	**0.477(0.032)**	**227**	**-2.89(1.04)**	**0.00585**
Red-breasted Sapsucker	**95**	**466**	**0.57(0.03)**	**0.28(0.03)**	**0.45(0.04)**	**52**	**898**	**0.456(0.033)**	**136**	**-4.67(1.60)**	**0.00421**
Ladder-backed Woodpecker	40	123	0.33(0.03)	0.16(0.02)	0.37(0.06)	22	147	0.610(0.090)	181	2.06(1.19)	0.08718
Nuttall's Woodpecker	60	205	0.42(0.04)	0.37(0.05)	0.80(0.12)	26	319	0.596(0.052)	63	-0.58(1.05)	0.58417
Downy Woodpecker	*571*	*2141*	*0.32(0.01)*	*0.28(0.01)*	*0.80(0.04)*	*264*	*2508*	*0.509(0.024)*	*2154*	*1.07(0.34)*	*0.00170*
Hairy Woodpecker	*403*	*1108*	*0.22(0.01)*	*0.11(0.00)*	*0.24(0.02)*	*171*	*800*	*0.666(0.035)*	*1589*	*1.47(0.62)*	*0.01850*
Three-toed Woodpecker	15	36	0.38(0.04)	0.06(0.02)	0.15(0.04)	4	28	0.775(0.120)	27	3.20(8.66)	0.71652
Northern Flicker	361	792	0.24(0.01)	0.09(0.01)	0.20(0.02)	166	684	0.433(0.072)			
Olive-sided Flycatcher	**64**	**104**	**0.24(0.02)**	**0.03(0.01)**	**0.05(0.01)**	**20**	**125**	**0.708(0.083)**	**537**	**-2.54(0.60)**	**0.00003**
Western Wood-Pewee	199	793	0.75(0.04)	0.10(0.01)	0.14(0.02)	84	1859	0.500(0.025)	724	0.36(0.60)	0.54816
Eastern Wood-Pewee	**217**	**622**	**0.36(0.01)**	**0.04(0.01)**	**0.09(0.02)**	**115**	**811**	**0.524(0.046)**	**1738**	**-2.38(0.23)**	**0.00000**
Acadian Flycatcher	**186**	**789**	**1.05(0.07)**	**0.11(0.01)**	**0.12(0.01)**	**82**	**3205**	**0.491(0.017)**	**720**	**-1.20(0.35)**	**0.00069**
Traill's Flycatcher	348	1249	1.13(0.07)	0.11(0.01)	0.08(0.01)	88	3790	0.482(0.018)	928	0.25(0.52)	0.62605
Least Flycatcher	**114**	**304**	**0.92(0.16)**	**0.31(0.06)**	**0.29(0.04)**	**31**	**1414**	**0.400(0.034)**	**1011**	**-2.64(0.54)**	**0.00000**
Hammond's Flycatcher	136	675	0.61(0.04)	0.21(0.03)	0.40(0.08)	56	1353	0.442(0.027)	289	0.28(0.64)	0.65661
Dusky Flycatcher	**154**	**701**	**1.13(0.09)**	**0.16(0.02)**	**0.13(0.02)**	**50**	**2527**	**0.499(0.021)**	**350**	**-1.49(0.70)**	**0.03393**
"Western" Flycatcher	267	1089	0.73(0.04)	0.27(0.02)	0.56(0.05)	75	3209	0.503(0.023)			
Black Phoebe	*101*	*294*	*0.24(0.03)*	*0.46(0.04)*	*1.50(0.19)*	*26*	*268*	*0.486(0.081)*	*121*	*4.17(1.33)*	*0.00221*
Eastern Phoebe	**172**	**428**	**0.25(0.02)**	**0.30(0.03)**	**0.91(0.10)**	**46**	**391**	**0.457(0.073)**	**1674**	**-1.12(0.33)**	**0.00062**
Vermilion Flycatcher	7	26	1.01(0.18)	0.46(0.12)	0.61(0.14)	5	102	0.368(0.154)	51	1.49(1.61)	0.36057
Ash-throated Flycatcher	113	386	0.76(0.04)	0.07(0.01)	0.09(0.01)	54	1172	0.645(0.045)	412	0.61(0.49)	0.21171
Great Crested Flycatcher	203	545	0.35(0.01)	0.02(0.00)	0.04(0.01)	114	699	0.644(0.050)	1852	-0.43(0.30)	0.14457

Table 3 continued.

Species[1]	MAPS captures and productivity index[2]					MAPS survival[3]			BBS trends[4]			
	Nsta	Nsta-yrs	Adults (SE)	Yng. (SE)	PI (SE)	Nsta	Nind	ϕ (SE)	Nrtes	Trend	(SE)	P-value
Brown-crested Flycatcher	*21*	*61*	*1.47 (0.41)*	*0.15 (0.04)*	*0.10 (0.04)*	*9*	*294*	*0.496 (0.066)*	*49*	*6.20 (1.62)*		*0.00049*
Eastern Kingbird	**86**	**212**	**0.38 (0.02)**	**0.04 (0.01)**	**0.07 (0.02)**	**39**	**251**	**0.459 (0.108)**	**2263**	**-2.05 (0.28)**		**0.00000**
White-eyed Vireo	187	829	1.15 (0.08)	0.57 (0.09)	0.42 (0.03)	89	3572	0.504 (0.014)	892	0.27 (0.35)		0.43399
Bell's Vireo	46	153	1.23 (0.13)	0.28 (0.04)	0.21 (0.03)	18	650	0.567 (0.033)	181	1.17 (1.38)		0.39799
Yellow-throated Vireo	60	93	0.21 (0.01)	0.03 (0.01)	0.05 (0.03)	18	60	0.617 (0.173)	954	0.86 (0.51)		0.09555
Plumbeous Vireo	29	82	0.35 (0.03)	0.05 (0.01)	0.16 (0.04)	10	95	0.616 (0.103)	151	-1.90 (1.13)		0.09408
Cassin's Vireo	135	451	0.43 (0.04)	0.22 (0.03)	0.44 (0.07)	32	573	0.566 (0.064)	290	-0.22 (0.78)		0.78349
Blue-headed Vireo	*46*	*123*	*0.36 (0.03)*	*0.04 (0.01)*	*0.06 (0.02)*	*15*	*151*	*0.393 (0.115)*	*540*	*3.92 (0.82)*		*0.00000*
Hutton's Vireo	87	219	0.19 (0.02)	0.15 (0.02)	0.35 (0.06)	20	133	0.568 (0.096)	128	2.25 (1.34)		0.09547
Warbling Vireo	*321*	*1341*	*1.15 (0.06)*	*0.15 (0.02)*	*0.14 (0.02)*	*133*	*6247*	*0.490 (0.014)*	*1731*	*1.11 (0.31)*		*0.00039*
Red-eyed Vireo	*345*	*1482*	*0.96 (0.04)*	*0.07 (0.01)*	*0.09 (0.01)*	*182*	*5774*	*0.578 (0.014)*	*2027*	*1.76 (0.21)*		*0.00000*
Gray Jay	**59**	**191**	**0.26 (0.02)**	**0.18 (0.02)**	**0.38 (0.05)**	**21**	**105**	**0.626 (0.064)**	**289**	**-3.93 (1.43)**		**0.00637**
Steller's Jay	129	356	0.25 (0.01)	0.08 (0.01)	0.23 (0.04)	63	365	0.713 (0.055)	418	0.25 (0.54)		0.64025
Blue Jay	258	747	0.38 (0.01)	0.09 (0.01)	0.18 (0.02)	158	1062	0.645 (0.049)	2190	-0.10 (0.18)		0.58917
Green Jay	4	14	0.56 (0.09)	0.04 (0.02)	0.02 (0.02)	3	28	0.94 (0.268)	9	13.68 (6.57)		0.07097
Western Scrub-Jay	**106**	**252**	**0.22 (0.02)**	**0.14 (0.01)**	**0.41 (0.06)**	**36**	**181**	**0.554 (0.090)**	**296**	**-1.35 (0.56)**		**0.01553**
Mexican Jay	4	17	0.55 (0.14)	0.03 (0.02)	0.04 (0.03)	3	38	0.366 (0.223)				
Tree Swallow	**104**	**250**	**0.89 (0.19)**	**0.15 (0.04)**	**0.09 (0.03)**	**48**	**815**	**0.392 (0.050)**	**1760**	**-1.18 (0.41)**		**0.00406**
Violet-green Swallow	33	72	0.42 (0.06)	0.05 (0.01)	0.15 (0.04)	9	189	0.460 (0.101)	531	-0.24 (0.77)		0.75203
N. Rough-winged Swallow	86	161	0.38 (0.03)	0.10 (0.03)	0.21 (0.07)	20	126	0.384 (0.175)	1550	-0.44 (0.96)		0.64222
Barn Swallow	**66**	**116**	**0.43 (0.06)**	**0.26 (0.05)**	**0.49 (0.14)**	**15**	**406**	**0.478 (0.063)**	**2992**	**-1.86 (0.22)**		**0.00000**
Carolina Chickadee	205	969	0.42 (0.02)	0.37 (0.02)	0.86 (0.06)	135	1677	0.491 (0.037)	943	0.58 (0.31)		0.06023
Black-capped Chickadee	*331*	*1497*	0.80 (0.03)	0.82 (0.05)	*1.2 (0.06)*	*169*	*3940*	*0.471 (0.017)*	*1521*	*1.33 (0.31)*		*0.00002*
Mountain Chickadee	108	515	0.73 (0.06)	0.65 (0.07)	0.92 (0.08)	53	1484	0.437 (0.032)	405	-0.13 (0.62)		0.83601
Chestnut-backed Chickadee	107	572	0.58 (0.04)	0.59 (0.06)	1.37 (0.17)	52	1375	0.421 (0.033)	156	-1.59 (0.93)		0.08975
Boreal Chickadee	32	109	0.48 (0.05)	0.35 (0.06)	0.69 (0.13)	11	135	0.446 (0.075)	96	-1.62 (2.86)		0.57236
Bridled Titmouse	9	28	0.36 (0.04)	0.38 (0.08)	1.02 (0.24)	6	40	0.642 (0.161)				
Oak Titmouse	**46**	**155**	**0.51 (0.05)**	**0.61 (0.08)**	**1.28 (0.17)**	**20**	**278**	**0.529 (0.058)**	**81**	**-2.34 (0.77)**		**0.00338**
Juniper Titmouse	14	36	0.48 (0.06)	0.13 (0.03)	0.20 (0.05)	4	51	0.586 (0.095)	86	-2.84 (3.23)		0.38266
Tufted Titmouse	*268*	*1298*	*0.53 (0.02)*	*0.52 (0.02)*	*1.07 (0.05)*	*161*	*2557*	*0.465 (0.02)*	*1383*	*1.04 (0.25)*		*0.00005*
Black-crested Titmouse	**24**	**157**	**0.50 (0.06)**	**0.60 (0.09)**	**1.23 (0.14)**	**19**	**312**	**0.498 (0.063)**	**59**	**-4.96 (2.22)**		**0.02974**
Verdin	21	57	0.47 (0.09)	0.71 (0.12)	1.34 (0.22)	5	71	0.522 (0.221)	103	-0.86 (1.43)		0.54769

Table 3 continued.

Species[1]	MAPS captures and productivity index[2]					MAPS survival[3]			BBS trends[4]		
	Nsta	Nsta-yrs	Adults (SE)	Yng. (SE)	PI (SE)	Nsta	Nind	ϕ (SE)	Nrtes	Trend (SE)	P-value
Bushtit	172	550	0.94 (0.08)	0.95 (0.09)	1.33 (0.10)	57	1945	0.359 (0.041)	215	-2.89 (1.75)	0.10116
Red-breasted Nuthatch	170	616	0.32 (0.02)	0.33 (0.03)	0.78 (0.08)	87	728	0.337 (0.077)	941	-0.55 (0.43)	0.20428
White-breasted Nuthatch	*244*	*556*	*0.26 (0.01)*	*0.13 (0.01)*	*0.29 (0.03)*	*107*	*485*	*0.442 (0.066)*	*1547*	*1.59 (0.55)*	*0.00417*
Brown Creeper	224	771	0.29 (0.01)	0.29 (0.02)	0.83 (0.06)	66	839	0.313 (0.052)	434	-1.52 (1.32)	0.24963
Carolina Wren	270	1244	0.82 (0.04)	0.67 (0.04)	1.06 (0.06)	138	3726	0.379 (0.015)	1184	-0.14 (0.26)	0.59657
Bewick's Wren	205	813	0.89 (0.06)	1.16 (0.10)	1.57 (0.10)	95	2485	0.428 (0.018)	477	-0.39 (0.68)	0.57085
House Wren	**296**	**1018**	**1.04 (0.07)**	**0.76 (0.06)**	**0.87 (0.08)**	**116**	**3793**	**0.341 (0.020)**	**1996**	**-1.73 (0.33)**	**0.00000**
Winter Wren	129	492	0.61 (0.06)	0.44 (0.06)	0.71 (0.09)	46	1101	0.362 (0.031)	670	-0.11 (0.47)	0.82053
Golden-crowned Kinglet	**141**	**618**	**0.49 (0.05)**	**1.27 (0.24)**	**1.93 (0.33)**	**69**	**1190**	**0.149 (0.075)**	**560**	**-2.41 (0.82)**	**0.00359**
Ruby-crowned Kinglet	96	362	0.91 (0.09)	0.71 (0.10)	0.91 (0.18)	34	1058	0.302 (0.055)	531	-0.15 (0.59)	0.80302
Arctic Warbler	7	24	3.44 (1.35)	1.68 (0.73)	0.26 (0.12)	2	259	0.324 (0.050)			
Blue-gray Gnatcatcher	**185**	**525**	**0.36 (0.02)**	**0.19 (0.01)**	**0.39 (0.04)**	**100**	**767**	**0.401 (0.087)**	**1260**	**-0.93 (0.38)**	**0.01507**
Eastern Bluebird	*95*	*219*	*0.33 (0.03)*	*0.33 (0.04)*	*0.79 (0.10)*	*40*	*255*	*0.404 (0.096)*	*1723*	*1.84 (0.28)*	*0.00000*
Western Bluebird	**30**	**93**	**0.38 (0.04)**	**0.32 (0.06)**	**0.69 (0.13)**	**17**	**148**	**0.321 (0.095)**	**214**	**-2.51 (1.01)**	**0.01349**
Townsend's Solitaire	57	123	0.19 (0.02)	0.12 (0.02)	0.18 (0.06)	4	29	0.571 (0.214)	270	-1.39 (1.06)	0.18983
Veery	**145**	**597**	**1.35 (0.10)**	**0.25 (0.02)**	**0.21 (0.02)**	**61**	**2709**	**0.587 (0.013)**	**874**	**-1.93 (0.43)**	**0.00001**
Gray-cheeked Thrush	24	72	1.30 (0.20)	0.40 (0.08)	0.24 (0.05)	6	253	0.441 (0.044)			
Bicknell's Thrush	5	10	1.29 (0.25)	0.08 (0.03)	0.06 (0.02)	1	28	0.613 (0.124)			
Swainson's Thrush	**295**	**1452**	**2.51 (0.15)**	**0.45 (0.04)**	**0.18 (0.01)**	**115**	**12238**	**0.586 (0.006)**	**632**	**-0.80 (0.34)**	**0.01847**
Hermit Thrush	249	912	0.84 (0.07)	0.41 (0.05)	0.37 (0.03)	82	2512	0.467 (0.016)	925	-0.67 (0.42)	0.10743
Wood Thrush	**260**	**1197**	**1.24 (0.06)**	**0.32 (0.02)**	**0.28 (0.02)**	**138**	**6057**	**0.435 (0.012)**	**1458**	**-2.83 (0.26)**	**0.00000**
American Robin	*567*	*2592*	*1.05 (0.04)*	*0.43 (0.03)*	*0.46 (0.04)*	*307*	*9936*	*0.508 (0.012)*	*3018*	*0.32 (0.13)*	*0.01544*
Varied Thrush	75	318	0.49 (0.04)	0.27 (0.04)	0.42 (0.06)	41	551	0.431 (0.052)	161	-1.39 (0.77)	0.07356
Wrentit	98	449	1.35 (0.17)	1.14 (0.11)	1.23 (0.09)	46	2232	0.594 (0.015)	114	-0.20 (0.99)	0.84078
Gray Catbird	308	1319	2.78 (0.21)	1.14 (0.11)	0.34 (0.02)	137	12026	0.511 (0.008)	1872	0.24 (0.24)	0.30585
Northern Mockingbird	94	236	0.57 (0.05)	0.24 (0.04)	0.48 (0.13)	34	539	0.286 (0.088)	1707	0.22 (0.25)	0.38734
Brown Thrasher	**195**	**560**	**0.44 (0.04)**	**0.14 (0.01)**	**0.3 (0.03)**	**60**	**756**	**0.572 (0.041)**	**1827**	**-1.43 (0.27)**	**0.00000**
Long-billed Thrasher	*5*	*26*	*2.10 (0.42)*	*0.38 (0.20)*	*0.37 (0.23)*	*4*	*176*	*0.582 (0.083)*	*19*	*15.01 (5.11)*	*0.00921*
California Thrasher	30	88	0.43 (0.04)	0.34 (0.06)	0.9 (0.14)	15	134	0.69 (0.108)	48	1.78 (2.51)	0.48120
European Starling	80	166	0.43 (0.08)	0.47 (0.08)	1.58 (0.35)	31	207	0.299 (0.248)	2987	-0.29 (0.29)	0.32008
Cedar Waxwing	**237**	**784**	**1.39 (0.09)**	**0.06 (0.01)**	**0.06 (0.01)**	**92**	**4167**	**0.53 (0.093)**	**1739**	**-1.77 (0.50)**	**0.00041**
Blue-winged Warbler	**83**	**326**	**0.83 (0.09)**	**0.23 (0.03)**	**0.29 (0.04)**	**35**	**1128**	**0.523 (0.029)**	**343**	**-3.80 (0.77)**	**0.00000**

Table 3 continued.

Species[1]	MAPS captures and productivity index[2]					MAPS survival[3]			BBS trends[4]			
	Nsta	Nsta-yrs	Adults (SE)	Yng. (SE)	PI (SE)	Nsta	Nind	ϕ (SE)	Nrtes	Trend	(SE)	P-value
Orange-crowned Warbler	**213**	**896**	**1.21 (0.10)**	**0.85 (0.09)**	**0.73 (0.09)**	**77**	**4657**	**0.422 (0.017)**	**392**	**-3.96 (0.68)**		**0.00000**
Nashville Warbler	134	535	0.77 (0.06)	0.85 (0.16)	1.19 (0.21)	34	1302	0.334 (0.047)	620	-0.61 (0.79)		0.44435
Virginia's Warbler	36	111	1.07 (0.18)	0.63 (0.12)	0.57 (0.12)	13	609	0.44 (0.058)	84	-2.72 (2.15)		0.20931
Lucy's Warbler	21	72	1.79 (0.44)	0.82 (0.26)	0.49 (0.08)	8	401	0.466 (0.065)	34	0.12 (1.83)		0.94929
Northern Parula	90	259	0.44 (0.04)	0.12 (0.02)	0.19 (0.04)	45	475	0.358 (0.073)	903	0.65 (0.37)		0.08078
Yellow Warbler	389	1531	2.47 (0.17)	1.02 (0.11)	0.35 (0.02)	151	12139	0.534 (0.009)	2066	-0.31 (0.24)		0.19440
Chestnut-sided Warbler	**76**	**254**	**1.09 (0.16)**	**0.33 (0.06)**	**0.25 (0.04)**	**22**	**929**	**0.448 (0.029)**	**709**	**-1.93 (0.43)**		**0.00001**
Magnolia Warbler	*64*	*208*	*1.02 (0.09)*	*0.37 (0.06)*	*0.35 (0.05)*	*17*	*651*	*0.395 (0.039)*	*458*	*1.48 (0.60)*		*0.01509*
Black-throated Blue Warbler	44	103	0.46 (0.05)	0.18 (0.05)	0.53 (0.38)	8	134	0.492 (0.089)	337	1.70 (1.27)		0.18422
Yellow-rumped Warbler	260	1134	1.30 (0.08)	0.88 (0.12)	0.65 (0.09)	100	5184	0.453 (0.020)				
Black-throated Gray Warbler	**93**	**255**	**0.27 (0.03)**	**0.18 (0.02)**	**0.68 (0.14)**	**20**	**174**	**0.441 (0.165)**	**218**	**-3.95 (0.83)**		**0.00000**
Black-throated Green Warbler	*60*	*193*	*0.82 (0.10)*	*0.20 (0.03)*	*0.23 (0.07)*	*23*	*485*	*0.394 (0.045)*	*573*	*1.31 (0.58)*		*0.02375*
Townsend's Warbler	53	311	1.01 (0.12)	0.87 (0.16)	0.94 (0.22)	29	1193	0.434 (0.040)	171	1.67 (0.93)		0.07333
Hermit Warbler	65	369	0.87 (0.10)	0.84 (0.14)	1.08 (0.21)	32	1275	0.597 (0.063)	107	0.73 (0.75)		0.33092
Blackburnian Warbler	23	51	0.32 (0.03)	0.18 (0.05)	0.28 (0.12)	5	46	0.566 (0.189)	393	-0.70 (0.73)		0.34078
Pine Warbler	**57**	**138**	**0.45 (0.05)**	**0.14 (0.03)**	**0.33 (0.08)**	**35**	**245**	**0.345 (0.128)**	**787**	**-0.96 (0.46)**		**0.03739**
Prairie Warbler	**60**	**217**	**0.85 (0.10)**	**0.29 (0.04)**	**0.38 (0.14)**	**28**	**676**	**0.457 (0.048)**	**593**	**-1.23 (0.54)**		**0.02187**
Blackpoll Warbler	**36**	**84**	**0.96 (0.16)**	**0.32 (0.06)**	**0.45 (0.12)**	**8**	**184**	**0.302 (0.068)**	**44**	**-7.27 (2.93)**		**0.01839**
Black-and-white Warbler	**223**	**803**	**0.44 (0.02)**	**0.22 (0.01)**	**0.43 (0.03)**	**82**	**1345**	**0.529 (0.032)**	**933**	**-1.67 (0.60)**		**0.00583**
American Redstart	**217**	**786**	**1.37 (0.12)**	**0.49 (0.07)**	**0.31 (0.04)**	**69**	**3913**	**0.502 (0.017)**	**1030**	**-1.29 (0.41)**		**0.00195**
Prothonotary Warbler	**76**	**264**	**0.82 (0.11)**	**0.30 (0.09)**	**0.22 (0.04)**	**23**	**711**	**0.457 (0.048)**	**306**	**-2.01 (0.71)**		**0.00463**
Worm-eating Warbler	122	490	0.53 (0.04)	0.28 (0.06)	0.57 (0.08)	31	946	0.547 (0.034)	271	0.39 (1.52)		0.79644
Swainson's Warbler	25	80	0.52 (0.06)	0.08 (0.02)	0.16 (0.06)	9	149	0.525 (0.090)	79	6.82 (4.05)		0.09738
Ovenbird	**289**	**1300**	**0.95 (0.04)**	**0.41 (0.03)**	**0.44 (0.03)**	**126**	**4655**	**0.552 (0.014)**	**1197**	**-0.50 (0.25)**		**0.04232**
Northern Waterthrush	105	314	0.70 (0.10)	0.39 (0.06)	0.48 (0.08)	23	615	0.503 (0.039)	427	-0.19 (0.7)		0.79031
Louisiana Waterthrush	139	478	0.45 (0.03)	0.31 (0.04)	0.54 (0.06)	38	697	0.505 (0.034)	378	1.12 (0.99)		0.26026
Kentucky Warbler	140	615	1.06 (0.07)	0.39 (0.04)	0.33 (0.03)	60	2266	0.537 (0.016)	536	-0.73 (0.57)		0.20493
Mourning Warbler	**49**	**150**	**0.74 (0.09)**	**0.17 (0.03)**	**0.19 (0.04)**	**9**	**272**	**0.445 (0.052)**	**435**	**-2.83 (0.61)**		**0.00001**
MacGillivray's Warbler	235	1275	1.76 (0.11)	0.81 (0.08)	0.52 (0.05)	99	7431	0.483 (0.010)	403	-0.48 (0.80)		0.55207
Common Yellowthroat	**488**	**1912**	**1.71 (0.10)**	**0.70 (0.07)**	**0.35 (0.02)**	**213**	**11334**	**0.479 (0.009)**	**2505**	**-1.02 (0.18)**		**0.00000**
Hooded Warbler	138	548	0.72 (0.06)	0.17 (0.02)	0.28 (0.04)	53	1556	0.47 (0.023)	526	0.41 (0.51)		0.42035
Wilson's Warbler	**267**	**1345**	**2.11 (0.20)**	**1.46 (0.27)**	**0.69 (0.08)**	**85**	**10861**	**0.405 (0.011)**	**369**	**-2.62 (0.80)**		**0.00115**

Table 3 continued.

Species[1]	MAPS captures and productivity index[2]					MAPS survival[3]			BBS trends[4]			
	Nsta	Nsta-yrs	Adults (SE)	Yng. (SE)	PI (SE)	Nsta	Nind	ϕ (SE)	Nrtes	Trend	(SE)	P-value
Canada Warbler	**74**	**226**	**0.61 (0.09)**	**0.30 (0.05)**	**0.43 (0.07)**	**11**	**380**	**0.456 (0.053)**	**323**	**-4.19**	**(1.13)**	**0.00024**
Yellow-breasted Chat	227	773	1.51 (0.12)	0.29 (0.03)	0.18 (0.02)	80	4003	0.489 (0.014)	1051	-0.27	(0.28)	0.33436
Summer Tanager	*142*	*491*	*0.52 (0.04)*	*0.04 (0.01)*	*0.07 (0.01)*	*69*	*883*	*0.535 (0.038)*	*724*	*0.91*	*(0.43)*	*0.03702*
Scarlet Tanager	**156**	**493**	**0.34 (0.01)**	**0.07 (0.01)**	**0.14 (0.02)**	**93**	**750**	**0.557 (0.063)**	**1043**	**-0.78**	**(0.36)**	**0.02898**
Western Tanager	*241*	*955*	*0.69 (0.04)*	*0.24 (0.02)*	*0.33 (0.04)*	*89*	*2296*	*0.521 (0.038)*	*590*	*2.00*	*(0.45)*	*0.00001*
Olive Sparrow	5	26	3.08 (0.76)	0.81 (0.32)	0.39 (0.22)	4	241	0.511 (0.048)	22	-2.11	(5.92)	0.72606
Green-tailed Towhee	79	215	0.54 (0.07)	0.28 (0.03)	0.42 (0.07)	18	431	0.616 (0.048)	268	-0.48	(0.92)	0.60003
Spotted Towhee	**205**	**865**	**1.10 (0.07)**	**0.67 (0.05)**	**0.68 (0.06)**	**100**	**3474**	**0.5 (0.016)**	**599**	**-0.80**	**(0.39)**	**0.04061**
Eastern Towhee	**195**	**713**	**0.40 (0.02)**	**0.16 (0.01)**	**0.35 (0.03)**	**114**	**1140**	**0.469 (0.030)**	**1341**	**-1.45**	**(0.3)**	**0.00000**
Canyon Towhee	16	37	0.58 (0.12)	0.13 (0.05)	0.20 (0.08)	4	56	0.926 (0.290)	89	-0.46	(1.19)	0.70339
California Towhee	**72**	**218**	**0.82 (0.09)**	**0.36 (0.06)**	**0.41 (0.05)**	**32**	**713**	**0.562 (0.037)**	**89**	**-1.51**	**(0.74)**	**0.04529**
Abert's Towhee	10	28	1.35 (0.16)	0.32 (0.08)	0.30 (0.09)	5	131	0.486 (0.126)	19	-0.69	(3.80)	0.85824
Rufous-crowned Sparrow	**46**	**149**	**0.51 (0.05)**	**0.35 (0.05)**	**0.75 (0.11)**	**19**	**269**	**0.528 (0.065)**	**93**	**-5.59**	**(1.30)**	**0.00006**
American Tree Sparrow	14	74	0.90 (0.27)	2.21 (0.46)	3.10 (0.43)	7	203	0.46 (0.063)				
Chipping Sparrow	**249**	**816**	**0.62 (0.03)**	**0.22 (0.02)**	**0.31 (0.03)**	**93**	**1802**	**0.427 (0.033)**	**2504**	**-0.62**	**(0.18)**	**0.00041**
Clay-colored Sparrow	**16**	**46**	**2.14 (0.73)**	**0.62 (0.26)**	**0.14 (0.04)**	**7**	**365**	**0.465 (0.101)**	**414**	**-1.55**	**(0.42)**	**0.00027**
Field Sparrow	**141**	**551**	**1.14 (0.09)**	**0.42 (0.05)**	**0.34 (0.03)**	**76**	**2365**	**0.443 (0.021)**	**1408**	**-3.69**	**(0.24)**	**0.00000**
Vesper Sparrow	**39**	**91**	**0.40 (0.06)**	**0.27 (0.08)**	**0.49 (0.11)**	**5**	**67**	**0.736 (0.098)**	**1218**	**-1.92**	**(0.34)**	**0.00000**
Lark Sparrow	75	185	0.71 (0.08)	0.33 (0.08)	0.32 (0.07)	18	482	0.453 (0.090)	872	0.46	(0.55)	0.40932
Black-throated Sparrow	**30**	**90**	**0.63 (0.22)**	**0.48 (0.18)**	**0.98 (0.34)**	**11**	**175**	**0.597 (0.202)**	**249**	**-6.19**	**(0.95)**	**0.00000**
Sage Sparrow	19	42	1.26 (0.36)	2.91 (1.59)	1.09 (0.54)	2	99	0.496 (0.277)	172	-1.01	(0.9)	0.26491
Savannah Sparrow	**69**	**203**	**1.09 (0.28)**	**0.86 (0.21)**	**1.16 (0.29)**	**15**	**609**	**0.574 (0.043)**	**1408**	**-1.89**	**(0.32)**	**0.00000**
Grasshopper Sparrow	**34**	**60**	**2.78 (0.43)**	**1.90 (0.43)**	**0.46 (0.08)**	**9**	**236**	**0.438 (0.069)**	**1150**	**-4.92**	**(0.72)**	**0.00000**
Fox Sparrow	107	442	0.86 (0.09)	0.42 (0.06)	0.52 (0.08)	42	1157	0.523 (0.026)	178	0.81	(0.53)	0.12437
Song Sparrow	**452**	**2067**	**2.01 (0.09)**	**1.91 (0.12)**	**0.95 (0.03)**	**217**	**13799**	**0.478 (0.007)**	**2280**	**-1.03**	**(0.15)**	**0.00000**
Lincoln's Sparrow	**153**	**670**	**1.47 (0.11)**	**0.88 (0.08)**	**0.67 (0.08)**	**54**	**2912**	**0.428 (0.013)**	**361**	**-1.37**	**(0.68)**	**0.04528**
Swamp Sparrow	*68*	*181*	*0.91 (0.17)*	*0.87 (0.20)*	*0.74 (0.17)*	*16*	*440*	*0.447 (0.042)*	*604*	*1.66*	*(0.56)*	*0.00305*
White-throated Sparrow	62	228	1.73 (0.19)	0.69 (0.11)	0.41 (0.05)	22	1176	0.342 (0.029)	585	-0.24	(0.36)	0.50238
White-crowned Sparrow	101	371	1.29 (0.14)	1.16 (0.19)	0.79 (0.12)	31	1416	0.450 (0.023)	267	-1.49	(0.75)	0.05015
Golden-crowned Sparrow	18	71	1.54 (0.35)	0.64 (0.18)	0.29 (0.06)	5	281	0.498 (0.043)				
Dark-eyed Junco	260	1339	1.68 (0.10)	1.70 (0.12)	1.23 (0.10)	127	7782	0.436 (0.010)				
Northern Cardinal	*347*	*1767*	*1.24 (0.05)*	*0.50 (0.03)*	*0.42 (0.02)*	*205*	*7990*	*0.546 (0.010)*	*1808*	*0.48*	*(0.16)*	*0.00222*

Table 3 continued.

Species[1]	MAPS captures and productivity index[2]					MAPS survival[3]			BBS trends[4]			
	Nsta	Nsta-yrs	Adults (SE)	Yng. (SE)	PI (SE)	Nsta	Nind	ϕ (SE)	Nrtes	Trend	(SE)	P-value
Pyrrhuloxia	**6**	**16**	**2.40 (0.92)**	**1.32 (0.51)**	**0.51 (0.09)**	**2**	**129**	**0.955 (0.252)**	**85**	**-4.14**	**(1.33)**	**0.00261**
Rose-breasted Grosbeak	**133**	**419**	**0.55 (0.04)**	**0.12 (0.01)**	**0.27 (0.04)**	**54**	**859**	**0.448 (0.056)**	**1071**	**-1.07**	**(0.45)**	**0.01756**
Black-headed Grosbeak	283	1137	1.10 (0.06)	0.34 (0.03)	0.34 (0.03)	119	4824	0.539 (0.017)	569	0.41	(0.54)	0.44227
Blue Grosbeak	*117*	*275*	*0.60 (0.08)*	*0.04 (0.01)*	*0.06 (0.02)*	*31*	*405*	*0.431 (0.076)*	*1016*	*0.69*	*(0.33)*	*0.03992*
Lazuli Bunting	193	652	0.93 (0.08)	0.23 (0.03)	0.22 (0.03)	52	2111	0.489 (0.031)	405	-1.19	(0.68)	0.08003
Indigo Bunting	269	1087	1.27 (0.07)	0.13 (0.01)	0.12 (0.01)	130	4927	0.475 (0.015)	1738	-0.05	(0.17)	0.77865
Varied Bunting	8	22	0.99 (0.14)	0.04 (0.03)	0.04 (0.03)	2	69	0.365 (0.282)				
Painted Bunting	*59*	*300*	*1.76 (0.3)*	*0.57 (0.13)*	*0.27 (0.04)*	*34*	*2013*	*0.548 (0.024)*	*276*	*2.91*	*(0.69)*	*0.00004*
Dickcissel	38	117	2.54 (0.29)	0.16 (0.03)	0.06 (0.01)	15	697	0.438 (0.073)	749	-0.56	(0.40)	0.16238
Red-winged Blackbird	192	565	1.27 (0.12)	0.13 (0.02)	0.09 (0.01)	94	2647	0.586 (0.036)	3104	-0.13	(0.20)	0.52558
Eastern Meadowlark	**14**	**43**	**0.46 (0.07)**	**0.12 (0.03)**	**0.17 (0.05)**	**12**	**55**	**0.590 (0.168)**	**1754**	**-4.34**	**(0.29)**	**0.00000**
Common Grackle	154	487	0.66 (0.05)	0.18 (0.03)	0.22 (0.05)	57	1192	0.426 (0.085)	2411	0.05	(0.34)	0.87871
Bronzed Cowbird	**9**	**25**	**0.95 (0.2)**	**0.02 (0.01)**	**0.00 (0.00)**	**4**	**84**	**0.444 (0.141)**	**58**	**-6.95**	**(3.37)**	**0.04491**
Brown-headed Cowbird	**490**	**1545**	**0.53 (0.02)**	**0.07 (0.01)**	**0.12 (0.01)**	**254**	**2766**	**0.489 (0.020)**	**3177**	**-1.72**	**(0.32)**	**0.00001**
Orchard Oriole	*68*	*183*	*0.74 (0.1)*	*0.15 (0.04)*	*0.23 (0.05)*	*23*	*330*	*0.433 (0.085)*	*1183*	*2.13*	*(0.41)*	*0.00000*
Bullock's Oriole	152	510	0.93 (0.07)	0.30 (0.04)	0.37 (0.05)	51	1500	0.442 (0.037)	577	-0.47	(0.54)	0.38589
Baltimore Oriole	**131**	**383**	**0.60 (0.05)**	**0.21 (0.03)**	**0.35 (0.08)**	**55**	**876**	**0.482 (0.047)**	**1449**	**-1.39**	**(0.32)**	**0.00001**
Pine Grosbeak	22	76	0.60 (0.05)	0.06 (0.02)	0.08 (0.04)	10	144	0.401 (0.130)	57	-3.53	(3.17)	0.27073
Purple Finch	166	602	1.30 (0.25)	0.47 (0.07)	0.37 (0.04)	57	4029	0.461 (0.020)	719	-1.87	(1.10)	0.08832
Cassin's Finch	**78**	**302**	**0.68 (0.06)**	**0.14 (0.02)**	**0.19 (0.03)**	**25**	**667**	**0.468 (0.093)**	**276**	**-7.82**	**(0.97)**	**0.00000**
House Finch	191	498	1.03 (0.16)	1.16 (0.27)	1.02 (0.11)	61	1514	0.508 (0.081)	1990	-0.85	(0.47)	0.06692
Common Redpoll	26	126	3.43 (0.97)	1.13 (0.27)	0.43 (0.09)	14	1631	0.385 (0.098)				
Pine Siskin	**153**	**623**	**1.12 (0.09)**	**0.46 (0.07)**	**0.46 (0.08)**	**52**	**2652**	**0.394 (0.095)**	**651**	**-6.22**	**(0.73)**	**0.00000**
Lesser Goldfinch	135	412	1.02 (0.08)	0.67 (0.16)	0.44 (0.08)	44	1625	0.385 (0.063)	275	1.15	(0.85)	0.17883
American Goldfinch	*345*	*1247*	*1.76 (0.12)*	*0.05 (0.01)*	*0.04 (0.01)*	*165*	*8850*	*0.432 (0.016)*	*2265*	*1.53*	*(0.26)*	*0.00000*

[1] Species common names follow nomenclature of the American Ornithologists' Union Checklist (http://www.aou.org/checklist/index.php3)

[2] These fields summarize captures from constant-effort mist-netting. Field definitions are as follows: Nsta = Number of stations used in capture summaries. Nsta-yrs = Number of station-years used in capture summaries (i.e., Nsta*Number of years of operation). Adults and Young = Number captures in these two age categories per 100 net-hours per station per year (see text for detail). This number represents a weighted average of the number of captures at each station with weights = the number of years of operation. PI = Productivity index (Young/Adult). Standard errors (SE) are presented in parentheses.

Table 3 continued.

---

[3] Average annual apparent survival rates (ϕ) and standard errors (SE) estimated from modified time-constant Cormack-Jolly-Seber models. We used the *ad hoc* Transient model described in Hines et al. (2004). Estimates were computed with the computer software TMSURVIV (http://www.mbr-pwrc.usgs.gov/software/doc/tmsurviv.html). Nsta = number of stations included in the analysis. Only stations that operated during at least 4 consecutive years were included. See text for detail.

[4] Trends, standard errors, and P-values were determined using the "estimating equations" approach of Link and Sauer (1994) and were obtained from the BBS website (Sauer et al. 2005). In a few instances, trend estimates were not available because of either differences in taxonomic aggregation between the MAPS analyses and the BBS analyses or lack of BBS coverage for that particular species.

Table 4. Summary of MAPS population parameters calculated for 37 target species at the scale of NABCI Bird Conservation Regions (BCRs).

	Capture rates and productivity index [2]					Capture-recapture parameter estimates [3]				
Species/BCR [1]	Nsta	Nsta-yrs	Adults(SE)	Young(SE)	PI(SE)	Nsta	Nind	ϕ(SE)	p(SE)	τ(SE)
Western Wood-Pewee										
Northern Rockies	22	72	0.90(0.13)	0.18(0.03)	0.21(0.04)	6	161	0.338(0.07)	0.623(0.137)	0.783(0.247)
Prairie Potholes	2	21	1.29(0.75)	0.19(0.08)	0.20(0.06)	2	89	0.445(0.083)	0.392(0.119)	1.000(0.362)
Sierra Nevada	22	148	0.69(0.06)	0.09(0.01)	0.15(0.03)	15	372	0.550(0.057)	0.234(0.055)	0.597(0.157)
Southern Rockies/Colorado Plateau	20	62	0.58(0.07)	0.06(0.05)	0.14(0.12)	7	131	0.345(0.112)	0.499(0.219)	0.254(0.150)
Coastal California	32	99	0.62(0.09)	0.06(0.01)	0.10(0.02)	8	193	0.585(0.073)	0.276(0.077)	0.637(0.205)
Northwestern Interior Forest	3	10	2.59(1.01)	0.40(0.15)	0.12(0.06)	2	84	0.430(0.122)	0.664(0.190)	0.323(0.165)
Northern Pacific Rainforest	41	157	0.47(0.06)	0.10(0.02)	0.21(0.05)	18	201	0.459(0.089)	0.259(0.104)	0.676(0.311)
Great Basin	40	179	1.02(0.09)	0.11(0.02)	0.10(0.02)	21	572	0.541(0.046)	0.388(0.058)	0.368(0.070)
Eastern Wood-Pewee										
Eastern Tallgrass Prairie	31	138	0.43(0.04)	0.05(0.02)	0.07(0.03)	17	198	0.646(0.095)	0.325(0.107)	0.153(0.066)
Prairie Hardwood Transition	10	28	0.37(0.06)	0.08(0.05)	0.15(0.11)	5	54	0.364(0.279)	0.127(0.219)	1.000(1.693)
Central Hardwoods	35	111	0.37(0.03)	0.05(0.02)	0.14(0.07)	25	163	0.477(0.133)	0.382(0.176)	0.207(0.119)
Mississippi Alluvial Valley	10	23	0.45(0.06)	0.09(0.03)	0.25(0.09)	4	33	0.401(0.298)	0.110(0.284)	1.000(2.699)
Southeastern Coastal Plain	21	52	0.28(0.03)	0.04(0.01)	0.04(0.02)	12	49	0.784(0.163)	0.411(0.194)	0.093(0.072)
Appalachian Mountains	29	86	0.33(0.03)	0.04(0.01)	0.11(0.05)	11	99	0.505(0.111)	0.341(0.141)	0.461(0.229)
Piedmont	9	27	0.36(0.06)	0.02(0.01)	0.03(0.02)	7	36	0.679(0.154)	0.258(0.162)	0.209(0.173)
New England/Mid-Atlantic Coast	31	96	0.32(0.03)	0.02(0.01)	0.03(0.01)	20	138	0.395(0.091)	0.429(0.138)	0.734(0.298)
Acadian Flycatcher										
Central Hardwoods	36	242	1.18(0.15)	0.10(0.02)	0.08(0.02)	27	1107	0.517(0.029)	0.509(0.042)	0.328(0.040)
Mississippi Alluvial Valley	16	65	2.73(0.31)	0.36(0.07)	0.11(0.02)	7	676	0.439(0.036)	0.633(0.058)	0.405(0.062)
Southeastern Coastal Plain	26	110	0.94(0.13)	0.10(0.02)	0.14(0.04)	13	399	0.547(0.045)	0.518(0.064)	0.335(0.064)
Appalachian Mountains	26	94	0.36(0.04)	0.05(0.01)	0.14(0.03)	9	118	0.479(0.128)	0.441(0.172)	0.308(0.159)
Piedmont	16	62	0.79(0.14)	0.08(0.02)	0.19(0.06)	9	179	0.521(0.086)	0.633(0.117)	0.345(0.108)
New England/Mid-Atlantic Coast	23	135	1.08(0.12)	0.10(0.01)	0.12(0.02)	12	656	0.468(0.037)	0.477(0.055)	0.490(0.077)
New England/Mid-Atlantic Coast	31	96	0.32(0.03)	0.02(0.01)	0.03(0.01)	20	138	0.395(0.091)	0.429(0.138)	0.734(0.298)

Table 4 continued.

Species/BCR [1]	Capture rates and productivity index [2]					Capture-recapture parameter estimates [3]				
	Nsta	Nsta-yrs	Adults(SE)	Young(SE)	PI(SE)	Nsta	Nind	ϕ(SE)	p(SE)	τ(SE)
"Traill's" Flycatcher										
Northern Rockies	34	148	1.75(0.32)	0.14(0.04)	0.12(0.03)	12	778	0.525(0.037)	0.500(0.052)	0.318(0.049)
Prairie Potholes	11	31	1.07(0.32)	0.25(0.15)	0.2(0.13)	3	42	0.378(0.285)	0.110(0.295)	1.000(2.827)
Boreal Hardwood Transition	10	42	3.29(0.79)	0.45(0.14)	0.11(0.03)	4	352	0.503(0.044)	0.563(0.068)	0.401(0.081)
Lower Grt Lakes/St Lawrence Plain	20	60	1.56(0.24)	0.32(0.08)	0.17(0.03)	8	278	0.385(0.066)	0.536(0.116)	0.370(0.112)
Atlantic Northern Forest	13	61	1.64(0.42)	0.12(0.03)	0.04(0.01)	4	387	0.460(0.070)	0.561(0.114)	0.131(0.043)
Sierra Nevada	14	54	0.45(0.06)	0.04(0.01)	0.1(0.04)	2	46	0.551(0.097)	0.408(0.133)	0.683(0.299)
Southern Rockies/Colorado Plateau	11	38	0.94(0.35)	0.08(0.04)	0.04(0.02)	4	148	0.649(0.151)	0.487(0.186)	0.078(0.046)
Western Alaska	4	21	0.92(0.28)	0.01(0.01)	0.01(0.01)	2	70	0.558(0.107)	0.714(0.139)	0.302(0.128)
Eastern Tallgrass Prairie	24	113	1.21(0.20)	0.05(0.02)	0.02(0.01)	5	367	0.349(0.081)	0.406(0.138)	0.342(0.140)
Prairie Hardwood Transition	13	48	1.11(0.31)	0.09(0.03)	0.08(0.02)	3	127	0.551(0.128)	0.330(0.139)	0.349(0.169)
Appalachian Mountains	16	44	0.77(0.17)	0.15(0.05)	0.22(0.07)	4	106	0.651(0.095)	0.589(0.131)	0.116(0.056)
Northwestern Interior Forest	18	67	1.17(0.24)	0.20(0.04)	0.16(0.03)	8	274	0.348(0.077)	0.607(0.160)	0.147(0.066)
Northern Pacific Rainforest	62	250	1.00(0.12)	0.07(0.01)	0.05(0.01)	15	571	0.464(0.044)	0.471(0.067)	0.321(0.065)
Great Basin	40	123	0.70(0.07)	0.05(0.01)	0.06(0.02)	6	161	0.460(0.102)	0.412(0.143)	0.310(0.133)
Dusky Flycatcher										
Northern Rockies	34	164	1.06(0.15)	0.14(0.02)	0.12(0.02)	14	627	0.450(0.042)	0.442(0.063)	0.351(0.068)
Sierra Nevada	26	147	1.20(0.21)	0.23(0.05)	0.2(0.04)	12	642	0.468(0.043)	0.385(0.061)	0.325(0.066)
Southern Rockies/Colorado Plateau	17	67	1.13(0.27)	0.16(0.06)	0.13(0.09)	6	288	0.526(0.116)	0.360(0.148)	0.096(0.051)
Northern Pacific Rainforest	27	101	1.02(0.21)	0.17(0.05)	0.14(0.03)	6	277	0.495(0.056)	0.435(0.079)	0.407(0.101)
Great Basin	44	201	1.27(0.22)	0.12(0.05)	0.11(0.02)	10	683	0.557(0.036)	0.423(0.048)	0.328(0.053)
Hammond's Flycatcher										
Northern Rockies	26	150	0.62(0.07)	0.12(0.02)	0.2(0.04)	13	307	0.342(0.050)	0.513(0.095)	0.786(0.190)
Sierra Nevada	20	117	0.62(0.15)	0.34(0.12)	0.78(0.42)	9	274	0.542(0.063)	0.385(0.083)	0.299(0.086)
Northern Pacific Rainforest	31	170	0.55(0.05)	0.34(0.10)	0.53(0.17)	16	323	0.460(0.059)	0.424(0.084)	0.477(0.121)
Great Basin	36	203	0.69(0.06)	0.12(0.02)	0.23(0.06)	17	441	0.451(0.049)	0.367(0.068)	0.519(0.115)
Western Flycatcher										
Coastal California	56	205	0.68(0.07)	0.32(0.04)	1.01(0.16)	16	999	0.410(0.065)	0.451(0.101)	0.120(0.035)
Sierra Madre Occidental	25	59	0.67(0.07)	0.02(0.01)	0.04(0.02)	4	211	0.654(0.077)	0.221(0.072)	0.397(0.146)
Northern Pacific Rainforest	81	468	0.90(0.08)	0.37(0.05)	0.68(0.09)	36	1498	0.508(0.028)	0.326(0.035)	0.414(0.053)
Great Basin	43	184	0.61(0.08)	0.11(0.01)	0.22(0.04)	13	340	0.410(0.071)	0.365(0.104)	0.366(0.123)

Table 4 continued.

Species/BCR [1]	Capture rates and productivity index [2]					Capture-recapture parameter estimates [3]				
	Nsta	Nsta-yrs	Adults(SE)	Young(SE)	PI(SE)	Nsta	Nind	ϕ(SE)	p(SE)	τ(SE)
White-eyed Vireo										
Edwards Plateau	9	60	2.94(0.61)	3.95(0.88)	1.24(0.18)	7	643	0.563(0.029)	0.571(0.044)	0.297(0.044)
Oaks and Prairies	12	78	1.70(0.43)	0.75(0.12)	0.73(0.19)	6	552	0.560(0.037)	0.433(0.049)	0.527(0.081)
Eastern Tallgrass Prairie	12	51	0.70(0.13)	0.17(0.05)	0.33(0.16)	4	177	0.543(0.057)	0.434(0.079)	0.408(0.115)
Central Hardwoods	32	175	1.09(0.14)	0.27(0.05)	0.23(0.04)	23	669	0.490(0.029)	0.578(0.047)	0.407(0.056)
West Gulf Coastal Plain/Ouachitas	8	27	0.71(0.16)	0.34(0.25)	0.47(0.18)	2	49	0.557(0.132)	0.343(0.145)	0.724(0.366)
Mississippi Alluvial Valley	14	59	2.26(0.34)	0.38(0.09)	0.16(0.03)	6	492	0.464(0.043)	0.542(0.066)	0.434(0.078)
Southeastern Coastal Plain	30	114	0.57(0.09)	0.25(0.05)	0.46(0.06)	12	250	0.414(0.054)	0.629(0.097)	0.391(0.102)
Appalachian Mountains	16	59	1.17(0.20)	0.33(0.06)	0.33(0.07)	7	244	0.455(0.060)	0.395(0.082)	0.770(0.190)
Piedmont	12	49	0.53(0.08)	0.28(0.08)	0.42(0.09)	7	112	0.449(0.068)	0.529(0.111)	0.815(0.240)
New England/Mid-Atlantic Coast	25	106	0.55(0.05)	0.15(0.04)	0.27(0.08)	9	232	0.468(0.068)	0.381(0.095)	0.393(0.124)
Peninsular Florida	5	15	1.02(0.26)	0.26(0.09)	0.19(0.05)	2	56	0.351(0.130)	0.427(0.233)	0.741(0.493)
Tamaulipan Brushlands	5	23	1.17(0.29)	0.37(0.06)	0.53(0.09)	4	96	0.215(0.139)	0.368(0.335)	0.885(0.912)
Bell's Vireo										
Oaks and Prairies	5	17	1.78(0.45)	0.39(0.16)	0.16(0.07)	3	72	0.563(0.084)	0.727(0.114)	0.336(0.132)
Eastern Tallgrass Prairie	15	60	1.54(0.22)	0.32(0.08)	0.18(0.05)	6	353	0.586(0.044)	0.317(0.052)	0.485(0.098)
Coastal California	4	24	1.13(0.62)	0.30(0.21)	0.24(0.03)	3	106	0.591(0.076)	0.556(0.107)	0.372(0.121)
Sierra Madre Occidental	7	21	0.77(0.13)	0.15(0.04)	0.19(0.07)	3	57	0.574(0.217)	0.136(0.132)	1.000(0.951)
Tamaulipan Brushlands	3	13	1.19(0.42)	0.32(0.10)	0.26(0.06)	2	56	0.419(0.160)	0.287(0.200)	1.000(0.760)
Warbling Vireo										
Northern Rockies	40	215	1.17(0.16)	0.21(0.08)	0.11(0.02)	23	857	0.495(0.031)	0.504(0.045)	0.456(0.059)
Prairie Potholes	9	27	0.78(0.13)	0.10(0.03)	0.12(0.03)	3	84	0.639(0.168)	0.293(0.177)	0.158(0.120)
Lower Grt Lakes/St Lawrence Plain	11	34	0.53(0.10)	0.32(0.17)	0.32(0.12)	5	53	0.618(0.316)	0.035(0.077)	1.000(2.168)
Sierra Nevada	27	174	2.06(0.20)	0.24(0.09)	0.11(0.03)	17	1402	0.430(0.029)	0.406(0.043)	0.401(0.054)
Southern Rockies/Colorado Plateau	23	102	1.59(0.28)	0.20(0.05)	0.10(0.02)	11	610	0.544(0.040)	0.318(0.047)	0.614(0.107)
Coastal California	38	107	0.55(0.09)	0.16(0.04)	0.61(0.18)	7	1095	0.528(0.052)	0.644(0.078)	0.048(0.012)
Sierra Madre Occidental	23	44	0.53(0.05)	0.03(0.01)	0.05(0.03)	4	188	0.365(0.104)	0.205(0.129)	1.000(0.676)
Northern Pacific Rainforest	61	257	0.91(0.12)	0.09(0.02)	0.09(0.02)	24	640	0.517(0.041)	0.331(0.050)	0.442(0.081)
Great Basin	53	283	1.32(0.14)	0.09(0.02)	0.07(0.01)	24	1192	0.520(0.029)	0.404(0.039)	0.424(0.053)

Table 4 continued.

Species/BCR [1]	Capture rates and productivity index [2]					Capture-recapture parameter estimates [3]				
	Nsta	Nsta-yrs	Adults(SE)	Young(SE)	PI(SE)	Nsta	Nind	ϕ(SE)	p(SE)	τ(SE)
Red-eyed Vireo										
Northern Rockies	15	58	0.83(0.14)	0.08(0.02)	0.13(0.04)	5	128	0.658(0.090)	0.205(0.072)	0.362(0.152)
Prairie Potholes	10	23	1.22(0.36)	0.05(0.02)	0.02(0.01)	4	102	0.475(0.106)	0.312(0.137)	0.638(0.320)
Boreal Hardwood Transition	19	76	1.50(0.18)	0.07(0.02)	0.05(0.01)	8	375	0.520(0.051)	0.578(0.073)	0.326(0.069)
Lower Grt Lakes/St Lawrence Plain	25	86	1.01(0.27)	0.18(0.08)	0.16(0.04)	12	276	0.527(0.056)	0.477(0.078)	0.511(0.118)
Atlantic Northern Forest	21	75	0.73(0.08)	0.01(0.01)	0.01(0.01)	8	226	0.555(0.076)	0.284(0.081)	0.468(0.156)
Eastern Tallgrass Prairie	28	134	0.79(0.07)	0.02(0.01)	0.04(0.01)	15	403	0.590(0.070)	0.127(0.051)	0.607(0.252)
Central Hardwoods	37	254	1.03(0.08)	0.09(0.02)	0.11(0.03)	29	1073	0.560(0.036)	0.201(0.033)	0.586(0.104)
Mississippi Alluvial Valley	11	34	0.45(0.05)	0.03(0.01)	0.04(0.02)	5	71	0.374(0.288)	0.059(0.185)	1.000(3.155)
Southeastern Coastal Plain	27	102	0.77(0.14)	0.05(0.01)	0.07(0.02)	18	349	0.604(0.064)	0.151(0.046)	0.630(0.203)
Appalachian Mountains	54	231	0.91(0.07)	0.11(0.02)	0.14(0.02)	27	856	0.538(0.049)	0.172(0.039)	0.637(0.153)
Piedmont	18	81	0.81(0.12)	0.07(0.02)	0.10(0.03)	13	276	0.546(0.087)	0.108(0.059)	1.000(0.559)
New England/Mid-Atlantic Coast	37	209	1.44(0.18)	0.06(0.02)	0.04(0.01)	23	1486	0.614(0.022)	0.285(0.024)	0.542(0.054)
Veery										
Northern Rockies	13	46	1.61(0.39)	0.23(0.07)	0.13(0.03)	6	181	0.570(0.049)	0.726(0.067)	0.414(0.087)
Prairie Potholes	5	13	0.86(0.26)	0.00(0.00)	0(0.00)	1	27	0.532(0.161)	0.293(0.198)	0.631(0.511)
Boreal Hardwood Transition	17	69	2.02(0.45)	0.33(0.11)	0.23(0.06)	7	369	0.587(0.038)	0.632(0.051)	0.439(0.066)
Lower Grt Lakes/St Lawrence Plain	17	73	0.90(0.14)	0.31(0.07)	0.31(0.06)	8	209	0.566(0.059)	0.615(0.08)	0.375(0.085)
Atlantic Northern Forest	20	77	1.04(0.14)	0.17(0.05)	0.13(0.03)	8	273	0.543(0.045)	0.513(0.063)	0.548(0.102)
Prairie Hardwood Transition	9	33	0.97(0.20)	0.17(0.06)	0.18(0.04)	4	105	0.718(0.091)	0.319(0.09)	0.520(0.176)
Appalachian Mountains	32	144	1.74(0.23)	0.31(0.04)	0.25(0.06)	13	925	0.593(0.02)	0.563(0.028)	0.567(0.046)
Piedmont	5	38	1.99(0.68)	0.38(0.12)	0.23(0.06)	4	288	0.584(0.033)	0.612(0.048)	0.536(0.082)
New England/Mid-Atlantic Coast	21	91	0.81(0.13)	0.19(0.06)	0.23(0.06)	9	324	0.568(0.041)	0.467(0.057)	0.454(0.084)

Table 4 continued.

Species/BCR [1]	Capture rates and productivity index [2]					Capture-recapture parameter estimates [3]				
	Nsta	Nsta-yrs	Adults(SE)	Young(SE)	PI(SE)	Nsta	Nind	ϕ(SE)	p(SE)	τ(SE)
Swainson's Thrush										
Northern Rockies	38	271	2.50(0.26)	0.35(0.07)	0.15(0.04)	24	2006	0.605(0.015)	0.515(0.021)	0.440(0.029)
Boreal Hardwood Transition	15	42	1.34(0.43)	0.22(0.07)	0.20(0.07)	1	83	0.559(0.076)	0.635(0.103)	0.609(0.170)
Atlantic Northern Forest	27	67	1.04(0.13)	0.17(0.04)	0.12(0.03)	6	124	0.608(0.062)	0.643(0.080)	0.619(0.129)
Sierra Nevada	7	28	0.53(0.14)	0.07(0.02)	0.12(0.04)	1	33	0.494(0.119)	0.546(0.181)	1.000(0.455)
Southern Rockies/Colorado Plateau	13	48	1.14(0.55)	0.07(0.04)	0.06(0.02)	3	210	0.550(0.051)	0.377(0.065)	0.932(0.194)
Coastal California	32	136	2.13(0.35)	0.39(0.1)	0.18(0.04)	9	2317	0.586(0.020)	0.620(0.028)	0.163(0.015)
Northwestern Interior Forest	18	95	1.76(0.33)	0.67(0.16)	0.41(0.07)	11	536	0.421(0.036)	0.537(0.061)	0.568(0.094)
Northern Pacific Rainforest	85	524	3.52(0.37)	0.70(0.11)	0.20(0.02)	45	5693	0.589(0.008)	0.668(0.012)	0.377(0.015)
Boreal Taiga Plains	4	23	1.23(0.24)	0.56(0.15)	0.44(0.11)	2	91	0.430(0.112)	0.655(0.181)	0.331(0.156)
Great Basin	30	165	2.51(0.42)	0.26(0.06)	0.09(0.02)	12	1093	0.589(0.017)	0.630(0.024)	0.550(0.041)
Wood Thrush										
Lower Grt Lakes/St Lawrence Plain	20	63	0.95(0.13)	0.22(0.04)	0.27(0.08)	9	213	0.365(0.067)	0.532(0.126)	0.458(0.152)
Atlantic Northern Forest	13	39	0.59(0.09)	0.22(0.04)	0.58(0.20)	6	123	0.284(0.085)	0.458(0.182)	0.773(0.364)
Eastern Tallgrass Prairie	25	93	0.87(0.13)	0.18(0.04)	0.21(0.12)	9	261	0.457(0.057)	0.320(0.073)	0.914(0.234)
Prairie Hardwood Transition	8	37	0.75(0.21)	0.36(0.12)	0.36(0.11)	5	141	0.345(0.084)	0.715(0.162)	0.491(0.183)
Central Hardwoods	35	223	1.53(0.20)	0.48(0.09)	0.33(0.05)	27	1290	0.449(0.026)	0.439(0.040)	0.544(0.064)
Southeastern Coastal Plain	26	119	1.52(0.25)	0.27(0.07)	0.17(0.03)	13	696	0.385(0.037)	0.642(0.067)	0.401(0.068)
Appalachian Mountains	53	224	0.97(0.10)	0.21(0.03)	0.22(0.03)	27	861	0.391(0.043)	0.412(0.068)	0.376(0.075)
Piedmont	19	109	1.67(0.31)	0.49(0.12)	0.42(0.10)	14	874	0.438(0.035)	0.486(0.057)	0.314(0.053)
New England/Mid-Atlantic Coast	40	249	1.43(0.15)	0.36(0.07)	0.29(0.04)	24	1553	0.470(0.021)	0.544(0.034)	0.339(0.036)

Table 4 continued.

Species/BCR [1]	Capture rates and productivity index [2]					Capture-recapture parameter estimates [3]				
	Nsta	Nsta-yrs	Adults(SE)	Young(SE)	PI(SE)	Nsta	Nind	ϕ(SE)	p(SE)	τ(SE)
Gray Catbird										
Northern Rockies	21	93	2.77(0.49)	0.73(0.21)	0.18(0.04)	9	683	0.554(0.039)	0.409(0.048)	0.465(0.070)
Prairie Potholes	10	44	4.09(1.16)	0.92(0.51)	0.17(0.06)	5	434	0.624(0.036)	0.428(0.046)	0.491(0.075)
Boreal Hardwood Transition	5	27	0.96(0.19)	0.12(0.02)	0.18(0.07)	4	140	0.294(0.100)	0.336(0.172)	0.684(0.369)
Lower Grt Lakes/St Lawrence Plain	23	81	3.95(0.64)	2.02(0.38)	0.50(0.06)	11	832	0.474(0.034)	0.540(0.052)	0.440(0.061)
Atlantic Northern Forest	14	54	1.00(0.26)	0.42(0.11)	0.29(0.07)	5	294	0.367(0.059)	0.589(0.115)	0.279(0.086)
Southern Rockies/Colorado Plateau	9	35	1.16(0.29)	0.49(0.44)	0.22(0.12)	5	162	0.542(0.082)	0.333(0.092)	0.962(0.315)
Eastern Tallgrass Prairie	34	178	3.61(0.71)	1.57(0.33)	0.46(0.07)	18	2216	0.482(0.020)	0.468(0.030)	0.436(0.039)
Prairie Hardwood Transition	16	74	2.75(0.42)	1.58(0.34)	0.63(0.09)	9	1085	0.529(0.027)	0.495(0.037)	0.416(0.047)
Central Hardwoods	26	124	1.49(0.30)	0.36(0.12)	0.20(0.04)	9	675	0.391(0.037)	0.569(0.067)	0.382(0.068)
Southeastern Coastal Plain	25	82	0.54(0.10)	0.14(0.04)	0.20(0.06)	8	149	0.521(0.131)	0.138(0.080)	0.489(0.292)
Appalachian Mountains	50	201	2.30(0.35)	1.14(0.26)	0.39(0.05)	20	1516	0.499(0.025)	0.417(0.034)	0.489(0.051)
Piedmont	15	61	4.37(1.11)	1.46(0.39)	0.43(0.12)	9	1285	0.581(0.021)	0.500(0.029)	0.451(0.040)
New England/Mid-Atlantic Coast	44	229	4.20(0.87)	1.81(0.47)	0.34(0.06)	22	2498	0.501(0.019)	0.408(0.026)	0.516(0.042)
Blue-winged Warbler										
Prairie Hardwood Transition	6	26	0.58(0.15)	0.14(0.03)	0.29(0.07)	3	139	0.657(0.078)	0.300(0.080)	0.376(0.129)
Central Hardwoods	21	128	1.30(0.23)	0.36(0.05)	0.33(0.06)	13	593	0.540(0.037)	0.394(0.049)	0.427(0.070)
Appalachian Mountains	19	57	0.59(0.09)	0.28(0.08)	0.52(0.17)	7	124	0.453(0.119)	0.678(0.180)	0.195(0.096)
Piedmont	4	17	0.47(0.16)	0.18(0.04)	0.31(0.09)	2	117	0.434(0.076)	0.319(0.104)	1.000(0.378)
Orange-crowned Warbler										
Northern Rockies	34	161	0.69(0.10)	0.54(0.13)	1.22(0.47)	14	377	0.435(0.065)	0.336(0.085)	0.467(0.136)
Southern Rockies/Colorado Plateau	14	62	0.98(0.36)	0.52(0.30)	0.68(0.38)	3	156	0.439(0.116)	0.427(0.178)	0.317(0.171)
Western Alaska	6	27	4.42(0.72)	4.46(0.85)	0.97(0.18)	1	364	0.343(0.044)	0.633(0.090)	0.458(0.106)
Coastal California	45	166	0.93(0.15)	0.64(0.13)	0.69(0.09)	16	1431	0.397(0.042)	0.364(0.061)	0.341(0.067)
Sierra Madre Occidental	13	29	0.63(0.07)	0.07(0.03)	0.09(0.05)	4	151	0.443(0.110)	0.322(0.146)	0.389(0.205)
Northwestern Interior Forest	15	84	1.70(0.35)	1.59(0.4)	0.82(0.15)	10	464	0.426(0.047)	0.482(0.078)	0.403(0.090)
Northern Pacific Rainforest	59	299	1.44(0.22)	0.86(0.16)	0.56(0.07)	25	1659	0.436(0.025)	0.512(0.041)	0.370(0.042)

Table 4 continued.

Species/BCR [1]	Capture rates and productivity index [2]					Capture-recapture parameter estimates [3]				
	Nsta	Nsta-yrs	Adults(SE)	Young(SE)	PI(SE)	Nsta	Nind	ϕ(SE)	p(SE)	τ(SE)
Yellow Warbler										
Northern Rockies	32	147	3.24(0.51)	1.44(0.36)	0.42(0.07)	15	1315	0.560(0.025)	0.502(0.034)	0.436(0.043)
Prairie Potholes	12	55	4.87(1.21)	2.93(1.21)	0.50(0.10)	7	786	0.571(0.029)	0.417(0.036)	0.541(0.064)
Boreal Hardwood Transition	5	16	1.14(0.38)	0.26(0.07)	0.30(0.11)	4	124	0.555(0.108)	0.116(0.072)	0.798(0.507)
Lower Grt Lakes/St Lawrence Plain	20	72	5.63(1.15)	3.03(0.93)	0.51(0.19)	9	1110	0.533(0.026)	0.516(0.037)	0.475(0.049)
Atlantic Northern Forest	8	32	0.94(0.26)	0.52(0.22)	0.49(0.11)	5	162	0.346(0.077)	0.857(0.128)	0.220(0.087)
Sierra Nevada	21	121	1.54(0.32)	0.68(0.12)	0.73(0.20)	10	592	0.585(0.030)	0.615(0.044)	0.284(0.041)
Southern Rockies/Colorado Plateau	19	102	5.54(1.32)	2.36(0.83)	0.31(0.06)	13	2520	0.577(0.018)	0.419(0.023)	0.466(0.034)
Western Alaska	6	32	5.11(1.00)	1.67(0.38)	0.40(0.05)	3	536	0.437(0.044)	0.522(0.073)	0.344(0.072)
Eastern Tallgrass Prairie	16	73	3.06(0.71)	1.17(0.35)	0.33(0.06)	6	810	0.520(0.032)	0.372(0.042)	0.527(0.074)
Prairie Hardwood Transition	13	46	1.44(0.58)	0.34(0.20)	0.41(0.12)	7	219	0.469(0.092)	0.449(0.121)	0.420(0.146)
Appalachian Mountains	17	63	0.97(0.20)	0.32(0.08)	0.30(0.06)	8	249	0.382(0.071)	0.388(0.112)	0.592(0.206)
New England/Mid-Atlantic Coast	20	73	1.03(0.21)	0.23(0.08)	0.20(0.07)	8	233	0.475(0.093)	0.249(0.100)	0.489(0.217)
Coastal California	41	131	1.03(0.19)	0.06(0.03)	0.07(0.03)	6	201	0.354(0.104)	0.249(0.133)	0.906(0.483)
Sierra Madre Occidental	8	24	1.49(0.40)	0.45(0.21)	0.33(0.17)	3	106	0.447(0.128)	0.651(0.194)	0.282(0.134)
Northwestern Interior Forest	14	41	4.17(2.11)	3.12(1.66)	0.62(0.13)	5	570	0.407(0.042)	0.455(0.070)	0.411(0.084)
Northern Pacific Rainforest	63	245	1.20(0.16)	0.32(0.05)	0.23(0.03)	14	864	0.513(0.034)	0.500(0.049)	0.312(0.045)
Great Basin	48	183	2.88(0.54)	1.06(0.22)	0.29(0.05)	21	1585	0.531(0.025)	0.557(0.037)	0.294(0.031)
Chestnut-sided Warbler										
Boreal Hardwood Transition	14	54	2.61(0.52)	0.58(0.14)	0.23(0.05)	5	430	0.383(0.042)	0.613(0.076)	0.602(0.116)
Lower Grt Lakes/St Lawrence Plain	10	28	0.48(0.11)	0.23(0.14)	0.43(0.19)	3	58	0.498(0.117)	0.404(0.164)	0.520(0.278)
Atlantic Northern Forest	12	45	0.76(0.19)	0.32(0.11)	0.3(0.09)	4	145	0.347(0.114)	0.339(0.176)	0.359(0.206)
Appalachian Mountains	22	84	0.87(0.24)	0.34(0.14)	0.25(0.06)	7	256	0.528(0.048)	0.416(0.065)	0.627(0.13)
New England/Mid-Atlantic Coast	6	20	0.47(0.11)	0.08(0.02)	0.09(0.03)	2	38	0.617(0.121)	0.845(0.132)	0.175(0.103)
Prairie Warbler										
Central Hardwoods	17	89	1.15(0.25)	0.35(0.09)	0.3(0.05)	13	377	0.500(0.061)	0.292(0.068)	0.551(0.145)
Southeastern Coastal Plain	14	55	0.77(0.16)	0.29(0.11)	0.57(0.62)	5	171	0.448(0.095)	0.260(0.106)	0.553(0.244)
Piedmont	4	17	0.85(0.22)	0.49(0.1)	0.56(0.1)	3	59	0.301(0.149)	0.589(0.303)	0.613(0.453)

Table 4 continued.

Species/BCR [1]	Capture rates and productivity index [2]					Capture-recapture parameter estimates [3]				
	Nsta	Nsta-yrs	Adults(SE)	Young(SE)	PI(SE)	Nsta	Nind	ϕ(SE)	p(SE)	τ(SE)
Black-and-white Warbler										
Boreal Hardwood Transition	11	47	0.74(0.12)	0.31(0.07)	0.31(0.08)	6	138	0.490(0.088)	0.584(0.135)	0.241(0.093)
Lower Great Lakes/St Lawrence Plain	12	37	0.46(0.09)	0.22(0.06)	0.46(0.17)	4	53	0.503(0.161)	0.424(0.239)	0.163(0.137)
Atlantic Northern Forest	20	94	0.68(0.13)	0.31(0.08)	0.36(0.06)	12	247	0.438(0.06)	0.498(0.093)	0.532(0.136)
Edwards Plateau	7	34	0.32(0.05)	0.28(0.05)	0.7(0.15)	3	31	0.636(0.198)	0.216(0.171)	0.327(0.296)
Eastern Tallgrass Prairie	12	41	0.37(0.05)	0.07(0.03)	0.16(0.08)	4	68	0.549(0.189)	0.084(0.1)	1.000(1.242)
Southeastern Coastal Plain	16	64	0.32(0.06)	0.20(0.04)	0.31(0.06)	6	73	0.656(0.162)	0.104(0.097)	1.000(0.985)
Appalachian Mountains	36	140	0.38(0.04)	0.30(0.04)	0.8(0.13)	14	219	0.445(0.081)	0.320(0.104)	0.681(0.255)
Piedmont	13	40	0.33(0.1)	0.22(0.06)	0.53(0.15)	5	57	0.420(0.137)	0.384(0.203)	0.873(0.537)
New England/Mid-Atlantic Coast	33	114	0.47(0.06)	0.10(0.02)	0.16(0.04)	11	228	0.627(0.064)	0.234(0.066)	0.473(0.155)
American Redstart										
Northern Rockies	19	111	1.41(0.53)	0.32(0.08)	0.22(0.05)	7	366	0.452(0.048)	0.519(0.078)	0.357(0.081)
Prairie Potholes	7	18	1.88(0.48)	0.27(0.12)	0.11(0.06)	2	102	0.511(0.16)	0.308(0.177)	0.311(0.219)
Boreal Hardwood Transition	14	67	2.14(0.43)	0.34(0.12)	0.13(0.03)	7	525	0.462(0.052)	0.265(0.059)	0.504(0.126)
Lower Grt Lakes/St Lawrence Plain	20	65	0.84(0.12)	0.15(0.03)	0.29(0.07)	7	210	0.427(0.082)	0.427(0.127)	0.361(0.14)
Atlantic Northern Forest	20	79	1.96(0.66)	0.68(0.35)	0.31(0.07)	10	503	0.412(0.045)	0.516(0.074)	0.470(0.092)
Eastern Tallgrass Prairie	15	52	0.76(0.14)	0.08(0.03)	0.07(0.02)	5	158	0.473(0.123)	0.253(0.137)	0.252(0.152)
Central Hardwoods	12	43	0.67(0.16)	0.12(0.06)	0.23(0.27)	2	88	0.593(0.122)	0.248(0.125)	0.414(0.231)
Appalachian Mountains	39	154	1.91(0.26)	1.23(0.24)	0.74(0.14)	15	1432	0.555(0.028)	0.278(0.031)	0.486(0.062)
New England/Mid-Atlantic Coast	27	85	0.59(0.12)	0.11(0.03)	0.21(0.07)	7	187	0.449(0.075)	0.447(0.111)	0.488(0.157)
Boreal Taiga Plains	4	27	3.14(1.28)	1.49(0.73)	0.38(0.17)	2	277	0.558(0.055)	0.396(0.071)	0.512(0.119)
Prothonotary Warbler										
Mississippi Alluvial Valley	16	63	1.09(0.13)	0.18(0.05)	0.13(0.03)	5	254	0.437(0.086)	0.169(0.076)	0.865(0.388)
Southeastern Coastal Plain	27	83	0.88(0.22)	0.60(0.26)	0.31(0.09)	8	282	0.467(0.073)	0.254(0.088)	0.610(0.239)
New England/Mid-Atlantic Coast	6	29	0.55(0.14)	0.12(0.04)	0.17(0.04)	3	66	0.565(0.126)	0.281(0.124)	0.572(0.296)
Worm-eating Warbler										
Central Hardwoods	32	157	0.51(0.06)	0.22(0.03)	0.43(0.08)	9	265	0.450(0.067)	0.509(0.104)	0.354(0.103)
Southeastern Coastal Plain	8	22	0.57(0.18)	0.18(0.08)	0.15(0.08)	1	32	0.393(0.323)	0.120(0.403)	1.000(3.662)
Appalachian Mountains	36	150	0.63(0.11)	0.57(0.18)	1.23(0.22)	9	331	0.470(0.071)	0.462(0.102)	0.316(0.093)
New England/Mid-Atlantic Coast	23	105	0.56(0.08)	0.13(0.03)	0.18(0.04)	8	282	0.631(0.048)	0.396(0.059)	0.397(0.083)

Table 4 continued.

Species/BCR [1]	Capture rates and productivity index [2]					Capture-recapture parameter estimates [3]				
	Nsta	Nsta-yrs	Adults(SE)	Young(SE)	PI(SE)	Nsta	Nind	ϕ(SE)	p(SE)	τ(SE)
Ovenbird										
Boreal Hardwood Transition	21	76	1.44(0.22)	0.49(0.10)	0.38(0.06)	7	362	0.596(0.057)	0.362(0.069)	0.341(0.084)
Lower Grt Lakes/St Lawrence Plain	13	56	0.81(0.15)	0.27(0.08)	0.45(0.18)	7	154	0.544(0.065)	0.576(0.097)	0.293(0.089)
Atlantic Northern Forest	31	113	0.79(0.09)	0.34(0.06)	0.35(0.05)	11	324	0.501(0.050)	0.459(0.072)	0.483(0.103)
Prairie Hardwood Transition	13	44	0.70(0.13)	0.12(0.04)	0.14(0.05)	3	90	0.572(0.204)	0.237(0.172)	0.254(0.202)
Central Hardwoods	36	202	0.74(0.10)	0.38(0.07)	0.44(0.07)	22	585	0.472(0.044)	0.445(0.066)	0.377(0.074)
Southeastern Coastal Plain	23	138	1.44(0.24)	0.84(0.23)	0.54(0.10)	13	708	0.519(0.033)	0.506(0.048)	0.423(0.059)
Appalachian Mountains	53	245	1.12(0.09)	0.53(0.08)	0.58(0.07)	25	1060	0.576(0.029)	0.418(0.037)	0.414(0.048)
Piedmont	15	85	0.90(0.15)	0.49(0.09)	0.77(0.23)	10	408	0.546(0.052)	0.421(0.067)	0.349(0.075)
New England/Mid-Atlantic Coast	45	233	0.83(0.08)	0.24(0.03)	0.33(0.05)	24	809	0.608(0.030)	0.373(0.038)	0.366(0.050)
Boreal Taiga Plains	4	26	1.31(0.23)	0.53(0.21)	0.43(0.20)	2	112	0.423(0.144)	0.484(0.226)	0.226(0.139)
Louisiana Waterthrush										
Eastern Tallgrass Prairie	14	41	0.42(0.05)	0.12(0.02)	0.24(0.10)	3	41	0.566(0.140)	0.413(0.178)	0.523(0.286)
Central Hardwoods	30	145	0.60(0.08)	0.40(0.06)	0.59(0.08)	12	291	0.483(0.055)	0.631(0.084)	0.337(0.078)
Appalachian Mountains	26	70	0.40(0.06)	0.43(0.16)	0.69(0.23)	4	68	0.698(0.187)	0.286(0.157)	0.200(0.139)
Piedmont	15	40	0.29(0.05)	0.14(0.03)	0.36(0.09)	6	42	0.419(0.319)	0.095(0.222)	1.000(2.336)
New England/Mid-Atlantic Coast	17	84	0.48(0.11)	0.45(0.11)	0.89(0.17)	6	183	0.541(0.050)	0.737(0.069)	0.338(0.079)
Kentucky Warbler										
Eastern Tallgrass Prairie	17	80	0.95(0.16)	0.21(0.07)	0.14(0.04)	8	255	0.596(0.045)	0.545(0.062)	0.514(0.091)
Central Hardwoods	38	255	1.54(0.15)	0.66(0.08)	0.46(0.04)	29	1416	0.521(0.019)	0.586(0.029)	0.454(0.039)
West Gulf Coastal Plain/Ouachitas	7	24	1.47(0.29)	0.29(0.07)	0.26(0.10)	2	127	0.609(0.095)	0.467(0.128)	0.164(0.074)
Mississippi Alluvial Valley	16	55	0.79(0.13)	0.28(0.08)	0.28(0.08)	5	166	0.547(0.071)	0.537(0.105)	0.222(0.076)
Southeastern Coastal Plain	15	34	0.58(0.18)	0.15(0.06)	0.12(0.05)	4	64	0.519(0.108)	0.442(0.148)	0.672(0.299)
Appalachian Mountains	24	71	0.53(0.14)	0.20(0.06)	0.27(0.09)	5	78	0.549(0.116)	0.389(0.150)	0.309(0.154)
Piedmont	10	24	0.45(0.11)	0.15(0.04)	0.27(0.15)	2	34	0.676(0.207)	0.480(0.264)	0.158(0.135)
New England/Mid-Atlantic Coast	10	68	0.56(0.07)	0.14(0.02)	0.26(0.05)	5	126	0.549(0.062)	0.702(0.085)	0.384(0.100)

Table 4 continued.

Species/BCR [1]	Capture rates and productivity index [2]					Capture-recapture parameter estimates [3]				
	Nsta	Nsta-yrs	Adults(SE)	Young(SE)	PI(SE)	Nsta	Nind	ϕ(SE)	p(SE)	τ(SE)
MacGillivray's Warbler										
Northern Rockies	37	264	2.30(0.26)	0.67(0.13)	0.58(0.23)	22	1961	0.504(0.018)	0.550(0.027)	0.436(0.035)
Sierra Nevada	25	170	2.15(0.36)	1.17(0.18)	0.84(0.16)	15	1209	0.501(0.021)	0.688(0.033)	0.374(0.037)
Southern Rockies/Colorado Plateau	24	100	1.41(0.35)	0.23(0.07)	0.18(0.05)	9	570	0.536(0.043)	0.435(0.057)	0.448(0.078)
Northern Pacific Rainforest	70	374	1.59(0.18)	1.20(0.22)	0.67(0.08)	29	2084	0.441(0.019)	0.632(0.031)	0.383(0.033)
Great Basin	54	311	1.66(0.24)	0.58(0.13)	0.28(0.04)	21	1566	0.478(0.021)	0.606(0.033)	0.420(0.039)
Prothonotary Warbler										
Mississippi Alluvial Valley	16	63	1.09(0.13)	0.18(0.05)	0.13(0.03)	5	254	0.437(0.086)	0.169(0.076)	0.865(0.388)
Southeastern Coastal Plain	27	83	0.88(0.22)	0.60(0.26)	0.31(0.09)	8	282	0.467(0.073)	0.254(0.088)	0.610(0.239)
New England/Mid-Atlantic Coast	6	29	0.55(0.14)	0.12(0.04)	0.17(0.04)	3	66	0.565(0.126)	0.281(0.124)	0.572(0.296)
Common Yellowthroat										
Northern Rockies	24	139	2.53(0.44)	0.60(0.12)	0.26(0.06)	14	1107	0.522(0.022)	0.538(0.032)	0.509(0.049)
Prairie Potholes	9	31	2.83(1.09)	0.62(0.45)	0.09(0.05)	5	266	0.392(0.070)	0.475(0.111)	0.673(0.196)
Boreal Hardwood Transition	13	56	1.79(0.70)	0.65(0.28)	0.32(0.10)	8	383	0.466(0.043)	0.554(0.067)	0.601(0.110)
Lower Grt Lakes/St Lawrence Plain	24	81	2.18(0.31)	0.96(0.20)	0.41(0.08)	9	473	0.414(0.041)	0.575(0.072)	0.462(0.088)
Atlantic Northern Forest	21	83	1.18(0.18)	0.66(0.17)	0.53(0.12)	11	449	0.446(0.046)	0.707(0.074)	0.243(0.051)
Southern Rockies/Colorado Plateau	10	35	0.43(0.08)	0.01(0.01)	0.01(0.01)	3	56	0.635(0.142)	0.385(0.167)	0.182(0.120)
Eastern Tallgrass Prairie	36	169	1.67(0.23)	0.45(0.11)	0.22(0.03)	19	1049	0.489(0.031)	0.440(0.045)	0.335(0.048)
Prairie Hardwood Transition	15	72	2.51(0.73)	1.16(0.52)	0.48(0.11)	9	690	0.415(0.039)	0.571(0.067)	0.312(0.057)
Central Hardwoods	31	176	1.42(0.18)	0.39(0.06)	0.26(0.03)	21	937	0.445(0.027)	0.554(0.045)	0.445(0.056)
Southeastern Coastal Plain	29	126	0.93(0.16)	0.47(0.14)	0.39(0.10)	12	459	0.363(0.042)	0.620(0.086)	0.273(0.067)
Appalachian Mountains	34	116	1.35(0.18)	0.42(0.07)	0.44(0.08)	16	545	0.465(0.040)	0.602(0.064)	0.336(0.059)
Piedmont	15	71	1.09(0.23)	0.30(0.09)	0.27(0.06)	10	499	0.435(0.039)	0.503(0.063)	0.571(0.099)
New England/Mid-Atlantic Coast	40	197	1.54(0.25)	0.47(0.13)	0.22(0.03)	24	1042	0.575(0.032)	0.375(0.040)	0.307(0.043)
Coastal California	57	204	2.45(0.47)	1.78(0.39)	0.65(0.06)	22	1805	0.526(0.025)	0.422(0.033)	0.441(0.044)
Sonoran and Mohave Deserts	8	24	2.41(0.66)	0.72(0.3)	0.26(0.07)	3	148	0.485(0.140)	0.418(0.176)	0.193(0.103)
Sierra Madre Occidental	8	25	4.16(1.69)	0.31(0.13)	0.10(0.03)	4	373	0.388(0.058)	0.626(0.110)	0.294(0.085)
Northern Pacific Rainforest	37	112	1.69(0.34)	1.04(0.29)	0.45(0.09)	8	478	0.440(0.037)	0.662(0.064)	0.312(0.060)
Great Basin	28	101	1.67(0.56)	1.04(0.50)	0.35(0.08)	9	478	0.482(0.062)	0.353(0.081)	0.258(0.072)

Table 4 continued.

Species/BCR [1]	Capture rates and productivity index [2]					Capture-recapture parameter estimates [3]				
	Nsta	Nsta-yrs	Adults(SE)	Young(SE)	PI(SE)	Nsta	Nind	ϕ(SE)	p(SE)	τ(SE)
Hooded Warbler										
Lower Grt Lakes/St Lawrence Plain	5	11	1.03(0.48)	0.15(0.09)	0.07(0.05)	2	44	0.358(0.155)	0.380(0.262)	1.000(0.858)
Central Hardwoods	21	78	0.47(0.07)	0.12(0.02)	0.22(0.07)	6	97	0.472(0.077)	0.540(0.119)	0.619(0.201)
Mississippi Alluvial Valley	12	40	0.79(0.15)	0.20(0.14)	0.16(0.08)	4	136	0.453(0.102)	0.413(0.142)	0.449(0.192)
Southeastern Coastal Plain	22	112	0.84(0.16)	0.15(0.03)	0.22(0.05)	14	399	0.508(0.045)	0.428(0.064)	0.404(0.085)
Appalachian Mountains	39	156	0.85(0.13)	0.24(0.04)	0.48(0.11)	12	521	0.456(0.039)	0.606(0.062)	0.419(0.069)
Piedmont	11	38	0.48(0.09)	0.17(0.05)	0.34(0.15)	5	69	0.352(0.133)	0.445(0.23)	0.713(0.446)
New England/Mid-Atlantic Coast	15	88	0.54(0.10)	0.10(0.02)	0.15(0.05)	8	230	0.516(0.053)	0.666(0.083)	0.174(0.053)
Wilson's Warbler										
Northern Rockies	32	124	1.05(0.20)	0.26(0.06)	0.19(0.04)	6	379	0.482(0.054)	0.469(0.082)	0.208(0.057)
Sierra Nevada	25	157	2.43(0.41)	0.98(0.22)	0.56(0.13)	12	1271	0.428(0.025)	0.611(0.043)	0.377(0.044)
Western Alaska	6	32	16.48(3.91)	22.65(6.39)	1.32(0.26)	3	1714	0.357(0.022)	0.655(0.045)	0.273(0.034)
Coastal California	33	137	2.02(0.26)	1.53(0.37)	0.86(0.13)	12	3554	0.441(0.025)	0.460(0.039)	0.178(0.021)
Northwestern Interior Forest	16	83	3.13(0.91)	4.38(1.07)	1.61(0.29)	8	830	0.346(0.039)	0.452(0.072)	0.362(0.074)
Northern Pacific Rainforest	86	526	1.71(0.16)	0.82(0.11)	0.90(0.20)	37	2957	0.418(0.019)	0.491(0.032)	0.359(0.032)
Great Basin	36	194	1.42(0.32)	0.14(0.04)	0.20(0.05)	6	154	0.368(0.107)	0.394(0.173)	0.206(0.121)
Yellow-breasted Chat										
Northern Rockies	6	22	1.45(0.50)	0.17(0.05)	0.11(0.04)	4	112	0.549(0.081)	0.486(0.109)	0.497(0.170)
Southern Rockies/Colorado Plateau	13	56	1.07(0.17)	0.18(0.04)	0.13(0.04)	8	263	0.507(0.060)	0.432(0.081)	0.534(0.129)
Eastern Tallgrass Prairie	10	44	1.05(0.22)	0.15(0.04)	0.11(0.02)	4	272	0.423(0.071)	0.355(0.100)	0.402(0.134)
Central Hardwoods	25	136	1.53(0.31)	0.21(0.06)	0.11(0.03)	18	697	0.507(0.032)	0.430(0.044)	0.558(0.075)
West Gulf Coastal Plain/Ouachitas	5	15	1.17(0.31)	0.18(0.07)	0.24(0.20)	1	95	0.482(0.245)	0.043(0.066)	1.000(1.428)
Mississippi Alluvial Valley	10	30	2.62(0.84)	0.39(0.18)	0.11(0.04)	3	229	0.474(0.056)	0.428(0.082)	0.681(0.169)
Appalachian Mountains	16	63	1.10(0.16)	0.21(0.07)	0.20(0.06)	7	253	0.437(0.062)	0.369(0.089)	0.561(0.160)
Coastal California	27	75	1.41(0.28)	0.22(0.08)	0.15(0.08)	6	331	0.461(0.049)	0.482(0.074)	0.577(0.118)
Sierra Madre Occidental	8	24	5.23(1.41)	0.31(0.10)	0.07(0.02)	3	440	0.575(0.040)	0.482(0.053)	0.539(0.083)
Tamaulipan Brushlands	1	5	11.4 —	1.85 —	0.19 —	1	174	0.465(0.057)	0.670(0.085)	0.904(0.188)
Northern Pacific Rainforest	33	136	1.47(0.19)	0.60(0.10)	0.40(0.05)	9	746	0.500(0.028)	0.528(0.044)	0.353(0.051)
Great Basin	13	42	1.73(0.37)	0.32(0.08)	0.21(0.06)	4	166	0.514(0.054)	0.561(0.081)	0.563(0.134)

Table 4 continued.

Species/BCR [1]	Capture rates and productivity index [2]					Capture-recapture parameter estimates [3]				
	Nsta	Nsta-yrs	Adults(SE)	Young(SE)	PI(SE)	Nsta	Nind	ϕ(SE)	p(SE)	τ(SE)
Chipping Sparrow										
Northern Rockies	34	162	0.76(0.08)	0.18(0.04)	0.24(0.06)	20	433	0.452(0.066)	0.260(0.078)	0.449(0.148)
Boreal Hardwood Transition	11	33	0.65(0.16)	0.12(0.07)	0.08(0.06)	3	59	0.510(0.170)	0.101(0.103)	1.000(1.018)
Sierra Nevada	20	92	0.67(0.10)	0.25(0.05)	0.34(0.08)	10	280	0.419(0.078)	0.151(0.070)	0.959(0.453)
Southern Rockies/Colorado Plateau	22	71	0.7(0.10)	0.39(0.12)	0.52(0.14)	6	173	0.476(0.120)	0.116(0.094)	1.000(0.844)
Eastern Tallgrass Prairie	9	27	0.66(0.13)	0.27(0.07)	0.34(0.11)	3	88	0.300(0.146)	0.213(0.201)	1.000(0.969)
Appalachian Mountains	24	66	0.43(0.07)	0.21(0.04)	0.46(0.10)	8	91	0.479(0.121)	0.465(0.182)	0.207(0.123)
New England/Mid-Atlantic Coast	13	50	0.7(0.25)	0.20(0.08)	0.18(0.05)	9	174	0.457(0.095)	0.239(0.096)	0.932(0.385)
Northwestern Interior Forest	3	22	0.68(0.11)	0.31(0.13)	0.33(0.10)	3	51	0.344(0.130)	0.410(0.231)	0.747(0.500)
Great Basin	35	128	0.65(0.13)	0.25(0.12)	0.37(0.16)	9	254	0.432(0.121)	0.169(0.101)	0.637(0.392)
Black-headed Grosbeak										
Northern Rockies	31	125	0.64(0.07)	0.12(0.03)	0.13(0.03)	12	225	0.555(0.106)	0.088(0.053)	1.000(0.589)
Prairie Potholes	1	12	1.48 —	0.75 —	0.78 —	1	69	0.454(0.169)	0.221(0.165)	0.673(0.525)
Sierra Nevada	26	105	1.02(0.16)	0.24(0.03)	0.36(0.08)	6	448	0.568(0.047)	0.281(0.052)	0.498(0.107)
Southern Rockies/Colorado Plateau	23	107	1.25(0.26)	0.34(0.14)	0.20(0.06)	12	522	0.543(0.052)	0.340(0.063)	0.370(0.084)
Coastal California	61	220	1.41(0.18)	0.27(0.04)	0.23(0.06)	25	1447	0.541(0.032)	0.305(0.037)	0.372(0.053)
Sonoran and Mohave Deserts	5	12	1.00(0.44)	0.08(0.05)	0.01(0.01)	1	28	0.520(0.172)	0.407(0.241)	0.301(0.249)
Sierra Madre Occidental	20	51	0.94(0.12)	0.09(0.03)	0.07(0.03)	9	256	0.335(0.073)	0.648(0.152)	0.255(0.094)
Northern Pacific Rainforest	72	325	0.94(0.09)	0.60(0.10)	0.65(0.09)	34	1135	0.531(0.037)	0.219(0.037)	0.475(0.089)
Great Basin	42	178	1.29(0.15)	0.21(0.04)	0.17(0.03)	19	694	0.573(0.036)	0.331(0.041)	0.625(0.092)
Lazuli Bunting										
Northern Rockies	22	78	0.96(0.15)	0.13(0.03)	0.08(0.02)	4	171	0.355(0.077)	0.459(0.134)	0.760(0.276)
Sierra Nevada	26	85	1.15(0.34)	0.43(0.16)	0.32(0.07)	2	330	0.631(0.073)	0.174(0.059)	0.242(0.091)
Southern Rockies/Colorado Plateau	17	77	0.90(0.13)	0.16(0.04)	0.18(0.07)	9	333	0.438(0.083)	0.391(0.124)	0.208(0.082)
Coastal California	42	131	0.61(0.07)	0.16(0.04)	0.21(0.05)	13	429	0.413(0.111)	0.160(0.094)	0.248(0.143)
Northern Pacific Rainforest	38	129	0.71(0.09)	0.18(0.04)	0.18(0.04)	10	196	0.735(0.103)	0.139(0.065)	0.101(0.060)
Great Basin	40	133	1.33(0.24)	0.32(0.09)	0.33(0.12)	11	595	0.455(0.049)	0.358(0.064)	0.497(0.104)

Table 4 continued.

Species/BCR [1]	Capture rates and productivity index [2]					Capture-recapture parameter estimates [3]				
	Nsta	Nsta-yrs	Adults(SE)	Young(SE)	PI(SE)	Nsta	Nind	ϕ(SE)	p(SE)	τ(SE)
Indigo Bunting										
Lower Grt Lakes/St Lawrence Plain	14	25	0.61(0.13)	0.05(0.05)	0.02(0.03)	3	25	0.672(0.191)	0.490(0.224)	0.317(0.213)
Eastern Tallgrass Prairie	41	214	1.55(0.17)	0.10(0.02)	0.07(0.01)	23	1324	0.432(0.031)	0.296(0.040)	0.657(0.099)
Prairie Hardwood Transition	14	56	0.85(0.18)	0.07(0.03)	0.09(0.04)	9	267	0.562(0.074)	0.265(0.077)	0.358(0.118)
Central Hardwoods	39	256	1.76(0.21)	0.15(0.02)	0.10(0.02)	29	1591	0.501(0.024)	0.348(0.030)	0.612(0.063)
West Gulf Coastal Plain/Ouachitas	6	23	3.72(0.80)	0.25(0.07)	0.14(0.12)	4	268	0.539(0.058)	0.596(0.082)	0.305(0.073)
Mississippi Alluvial Valley	15	55	2.49(0.43)	0.16(0.07)	0.07(0.02)	5	438	0.470(0.047)	0.588(0.076)	0.252(0.057)
Southeastern Coastal Plain	25	75	0.52(0.09)	0.07(0.02)	0.19(0.05)	12	139	0.500(0.103)	0.275(0.111)	0.540(0.245)
Appalachian Mountains	45	183	0.95(0.13)	0.22(0.05)	0.22(0.04)	21	521	0.409(0.046)	0.502(0.078)	0.413(0.087)
Piedmont	14	58	0.78(0.17)	0.12(0.04)	0.15(0.03)	9	190	0.450(0.078)	0.543(0.121)	0.458(0.145)
New England/Mid-Atlantic Coast	16	59	0.35(0.04)	0.03(0.01)	0.13(0.06)	8	90	0.541(0.169)	0.063(0.079)	1.000(1.271)
Painted Bunting										
Edwards Plateau	10	66	1.38(0.34)	0.49(0.13)	0.35(0.10)	8	368	0.498(0.050)	0.665(0.074)	0.281(0.060)
Oaks and Prairies	20	145	1.54(0.21)	0.49(0.15)	0.26(0.04)	14	855	0.584(0.030)	0.454(0.040)	0.392(0.049)
Eastern Tallgrass Prairie	10	41	0.72(0.13)	0.05(0.02)	0.15(0.11)	5	119	0.334(0.116)	0.263(0.178)	1.000(0.773)
Southeastern Coastal Plain	3	7	2.97(0.82)	0.76(0.24)	0.21(0.06)	2	64	0.709(0.127)	0.384(0.121)	0.460(0.176)
Tamaulipan Brushlands	4	17	8.93(2.54)	3.33(1.11)	0.55(0.16)	3	565	0.498(0.080)	0.244(0.078)	0.358(0.116)
Bullock's Oriole										
Prairie Potholes	1	11	1.38 —	0.84 —	0.73 —	1	58	0.605(0.208)	0.057(0.064)	0.936(1.043)
Southern Rockies/Colorado Plateau	13	47	0.42(0.09)	0.12(0.07)	0.16(0.07)	6	71	0.658(0.210)	0.576(0.232)	0.171(0.111)
Coastal California	47	123	0.85(0.1)	0.24(0.05)	0.27(0.06)	13	324	0.420(0.121)	0.187(0.126)	0.382(0.276)
Sonoran and Mohave Deserts	7	20	1.23(0.45)	0.20(0.09)	0.15(0.04)	2	115	0.244(0.116)	0.472(0.287)	0.227(0.184)
Sierra Madre Occidental	6	16	1.12(0.48)	0.07(0.04)	0.01(0.01)	3	67	0.589(0.276)	0.171(0.160)	0.264(0.249)
Northern Pacific Rainforest	20	97	0.71(0.15)	0.37(0.16)	0.7(0.22)	7	266	0.404(0.100)	0.286(0.127)	0.381(0.187)
Great Basin	32	117	1.48(0.21)	0.45(0.09)	0.32(0.07)	13	511	0.479(0.050)	0.416(0.070)	0.436(0.092)
Baltimore Oriole										
Lower Grt Lakes/St Lawrence Plain	18	63	0.89(0.18)	0.27(0.07)	0.41(0.10)	12	207	0.155(0.110)	0.323(0.322)	1.000(1.089)
Atlantic Northern Forest	5	17	0.35(0.06)	0.04(0.02)	0.07(0.04)	2	69	0.355(0.096)	0.808(0.167)	0.370(0.179)
Eastern Tallgrass Prairie	29	125	0.70(0.13)	0.24(0.07)	0.19(0.07)	15	280	0.359(0.082)	0.208(0.109)	1.000(0.570)
Prairie Hardwood Transition	15	46	0.47(0.06)	0.20(0.07)	0.50(0.20)	6	132	0.755(0.084)	0.198(0.069)	0.304(0.123)
New England/Mid-Atlantic Coast	20	41	0.27(0.04)	0.11(0.05)	0.27(0.13)	8	52	0.634(0.134)	0.392(0.178)	0.174(0.118)

Table 4 continued.

---

[1] Species common names follow nomenclature of the American Ornithologists' Union Checklist (http://www.aou.org/checklist/index.php3). A map and description of BCRs can be downloaded at: http://www.nabci-us.org/map.html.

[2] These fields summarize captures from constant-effort mist-netting. Field definitions are as follows: Nsta = Number of stations used in capture summaries. Nsta-yrs = Number of station-years used in capture summaries (i.e., Nsta*Number of years of operation). Adults and Young = Average number of captures per 100 net-hours per station. These means are weighted by the number of years that stations were in operation.

[3] Average annual apparent survival rates (ϕ). recapture probabilities (p), proportion residents (τ) of newly-banded birds seen once in their first year of capture, and standard errors (SE) estimated from modified time-constant Cormack-Jolly-Seber models. We implemented the *ad hoc* Transient model described in Hines et al. (2004) using the computer software TMSURVIV (http://www.mbr-pwrc.usgs.gov/software/doc/tmsurviv.html) to obtain these estimates. Nsta = number of stations included in the analysis. Only stations that operated during at least 4 consecutive years were included. See text for detail.

Table 5. Distribution of deviations from standardized mean values of MAPS vital rates (productivity and survival) and BBS population trends from 1992-2003 for the 39 target species in each BBS physiographic stratum. We consider negative mean values of these deviations with 95% confidence intervals that do not include zero to indicate a deficiency in a particular metric. These deficiencies are indicated by letters representing the particular metric (P = productivity, S = Survival, T = Trend).

			Productivity Index (PI)				Adult apparent survival rate				BBS Trend			
BBS Stratum	Deficiency	No. Species	Mean	SE	Upper 95%	Lower 95%	Mean	SE	Upper 95%	Lower 95%	Mean	SE	Upper 95%	Lower 95%
Allegheny Plateau	T	12	0.91	0.26	0.33	1.49	-0.20	0.35	-0.97	0.57	-0.46	0.12	-0.71	-0.21
Aspen Parklands		7	-0.12	0.55	-1.47	1.22	-0.07	0.35	-0.93	0.80	0.59	0.50	-0.65	1.82
Basin and Range	P	7	-0.48	0.16	-0.86	-0.09	-0.17	0.29	-0.89	0.54	-0.13	0.34	-0.97	0.70
Black Prairie	S	3	-0.07	0.37	-1.67	1.53	-0.89	0.11	-1.36	-0.42	-0.15	0.22	-1.08	0.78
Blue Ridge Mountains	S	2	-0.44	0.23	-3.40	2.51	-1.82	0.05	-2.41	-1.23	1.19	1.92	-23.21	25.60
California Foothills		9	0.17	0.39	-0.72	1.06	-0.23	0.18	-0.64	0.18	0.19	0.54	-1.05	1.42
Cascade Mountains	P	14	-0.62	0.12	-0.88	-0.36	0.57	0.20	0.14	1.00	-0.18	0.25	-0.73	0.36
Central Rockies	P	16	-0.45	0.18	-0.83	-0.07	0.07	0.24	-0.44	0.58	-0.08	0.12	-0.35	0.18
Central Valley		5	-0.35	0.41	-1.48	0.79	0.15	0.52	-1.30	1.61	-0.73	1.05	-3.65	2.19
Closed Boreal Forest		3	0.66	0.37	-0.95	2.26	-0.40	0.78	-3.78	2.97	0.16	0.26	-0.97	1.29
Coastal Flatwoods	T	10	0.22	0.25	-0.34	0.79	-0.32	0.30	-1.00	0.36	-0.74	0.17	-1.12	-0.37
Columbia Plateau		7	0.85	0.52	-0.42	2.12	0.95	0.49	-0.25	2.14	0.12	0.25	-0.50	0.74
Cumberland Plateau		2	2.44	1.26	-13.52	18.39	-0.27	1.64	-21.07	20.52	0.12	0.74	-9.26	9.51
Dissected Rockies		17	0.21	0.27	-0.35	0.78	0.19	0.19	-0.21	0.59	-0.02	0.23	-0.50	0.47
Dissected Till Plains		8	0.08	0.46	-1.01	1.16	0.15	0.24	-0.41	0.72	0.53	0.36	-0.31	1.38
Driftless Area		5	-0.67	0.40	-1.78	0.44	-0.05	0.50	-1.43	1.33	0.46	0.38	-0.60	1.52
East Texas Prairies		4	1.06	0.52	-0.59	2.72	0.70	0.32	-0.30	1.71	0.81	1.03	-2.46	4.08
Edward's Plateau		2	-0.31	0.41	-5.48	4.86	0.44	0.30	-3.39	4.26	0.88	0.33	-3.30	5.07
Floridian		1	-1.04				-0.84							
Glaciated Coastal Plain	P	7	-0.78	0.16	-1.17	-0.39	0.46	0.42	-0.58	1.50	-0.06	0.53	-1.35	1.23
Great Basin Deserts	P	7	-0.67	0.24	-1.26	-0.07	0.35	0.33	-0.46	1.16	0.43	2.00	-24.94	25.79
Great Lakes Plain		14	-0.02	0.26	-0.57	0.54	-0.08	0.23	-0.57	0.42	0.07	0.16	-0.28	0.41
Great Lakes Transition		10	-0.05	0.23	-0.58	0.47	0.03	0.26	-0.55	0.61	0.08	0.11	-0.16	0.32
Great Plains Roughlands		5	1.46	0.78	-0.70	3.62	0.65	0.45	-0.59	1.89	0.80	0.23	0.15	1.45
Highland Rim		15	-0.19	0.18	-0.59	0.20	0.06	0.24	-0.46	0.58	0.44	0.22	-0.03	0.90
Intermountain Grasslands		7	-0.36	0.29	-1.08	0.36	0.06	0.60	-1.42	1.54	0.01	0.49	-1.20	1.21
Lexington Plain	S	17	0.08	0.15	-0.23	0.39	-0.57	0.20	-1.00	-0.14	-0.37	0.37	-1.16	0.42
Los Angeles Ranges		1	-0.05				-0.16				0.90			
Mexican Highlands		6	-0.48	0.25	-1.13	0.17	-0.07	0.36	-1.00	0.85	0.25	0.30	-0.51	1.02

Table 5 continued.

BBS Stratum	Deficiency	No. Species	Productivity Index (PI)				Adult apparent survival rate				BBS Trend			
			Mean	SE	Upper 95%	Lower 95%	Mean	SE	Upper 95%	Lower 95%	Mean	SE	Upper 95%	Lower 95%
Mississippi Alluvial Plain		9	-0.04	0.26	-0.63	0.55	-0.43	0.19	-0.88	0.01	-0.34	0.26	-0.94	0.26
Mojave Desert		1	-0.53				-2.02				-1.99			
N. Pacific Rainforests	T	4	-0.27	0.39	-1.49	0.96	-0.24	0.81	-2.82	2.34	-0.51	0.16	-1.01	-0.02
N. Spruce-Hardwoods	T	12	-0.25	0.16	-0.60	0.10	-0.29	0.21	-0.75	0.16	-0.21	0.09	-0.40	-0.02
Northern New England	P, S, T	13	-0.72	0.12	-0.99	-0.46	-0.67	0.16	-1.01	-0.32	-0.74	0.11	-0.97	-0.51
Northern Piedmont		16	0.43	0.27	-0.14	1.00	0.17	0.20	-0.27	0.60	0.11	0.22	-0.36	0.57
Northern Rockies		1	0.39				-0.69				0.42			
Ohio Hills	T	10	-0.16	0.23	-0.68	0.37	0.32	0.28	-0.31	0.94	-0.59	0.19	-1.03	-0.15
Open Boreal Forest	P	7	0.94	0.30	0.21	1.67	-0.69	0.15	-1.07	-0.32				
Osage Plain-Cross Timbers		10	-0.56	0.26	-1.14	0.03	0.42	0.32	-0.29	1.14	0.68	0.27	0.07	1.28
Ozark-Ouachita Plateau	P	13	-0.53	0.14	-0.84	-0.23	0.54	0.20	0.10	0.97	-0.11	0.16	-0.45	0.24
Pinyon-Juniper Woodlands	P	6	-0.79	0.27	-1.49	-0.09	0.24	0.63	-1.37	1.85	0.12	0.25	-0.51	0.76
Pitt-Klamath Plateau		14	0.12	0.24	-0.41	0.64	-0.01	0.16	-0.35	0.34	0.02	0.19	-0.39	0.44
Ridgeand Valley		13	0.00	0.20	-0.44	0.45	-0.22	0.32	-0.92	0.49	-0.17	0.09	-0.37	0.04
Rolling Red Prairies		8	-0.29	0.42	-1.29	0.70	0.25	0.47	-0.87	1.37	1.20	0.49	0.00	2.41
S. Alaska Coast	S	4	0.57	0.47	-0.94	2.07	-1.22	0.34	-2.29	-0.14				
S. California Grasslands		8	-0.08	0.36	-0.92	0.77	0.07	0.32	-0.69	0.83	-0.56	0.49	-1.74	0.63
S. Pacific Rainforests		16	0.63	0.26	0.07	1.19	0.07	0.24	-0.44	0.58	-0.16	0.11	-0.40	0.08
Sierra Nevada		12	0.37	0.27	-0.22	0.97	0.27	0.19	-0.15	0.69	-0.41	0.29	-1.05	0.24
South Texas Brushlands		4	0.57	0.37	-0.61	1.75	-1.08	0.47	-2.57	0.41	0.63	1.04	-2.69	3.95
Southern New England		15	-0.14	0.22	-0.61	0.34	0.36	0.17	-0.02	0.73	-0.08	0.22	-0.56	0.40
Southern Piedmont		11	0.78	0.27	0.17	1.39	-0.24	0.30	-0.91	0.43	-0.06	0.18	-0.46	0.34
Southern Rockies		11	-0.07	0.20	-0.52	0.38	0.74	0.21	0.27	1.22	0.84	0.34	0.07	1.61
St. Lawrence River Plain		8	0.60	0.25	0.01	1.19	-0.10	0.15	-0.46	0.26	-0.11	0.07	-0.28	0.05
Till Plains		4	0.25	0.67	-1.87	2.38	-0.96	0.31	-1.94	0.01	-0.52	0.20	-1.16	0.11
Tundra		4	-0.03	0.42	-1.37	1.31	-0.45	0.40	-1.72	0.83				
Upper Coastal Plain	P	17	-0.35	0.14	-0.65	-0.05	0.33	0.20	-0.09	0.76	0.11	0.16	-0.23	0.45
Willamette Lowlands	S	7	0.38	0.51	-0.87	1.64	-1.13	0.40	-2.12	-0.15	0.03	0.30	-0.71	0.78
Wyoming Basin	P	7	-0.61	0.18	-1.06	-0.16	0.54	0.34	-0.28	1.37	0.53	0.47	-0.63	1.69

Figure 1. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Western Wood-Pewee (*Contopus sordidulus*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Western Wood-Pewees and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

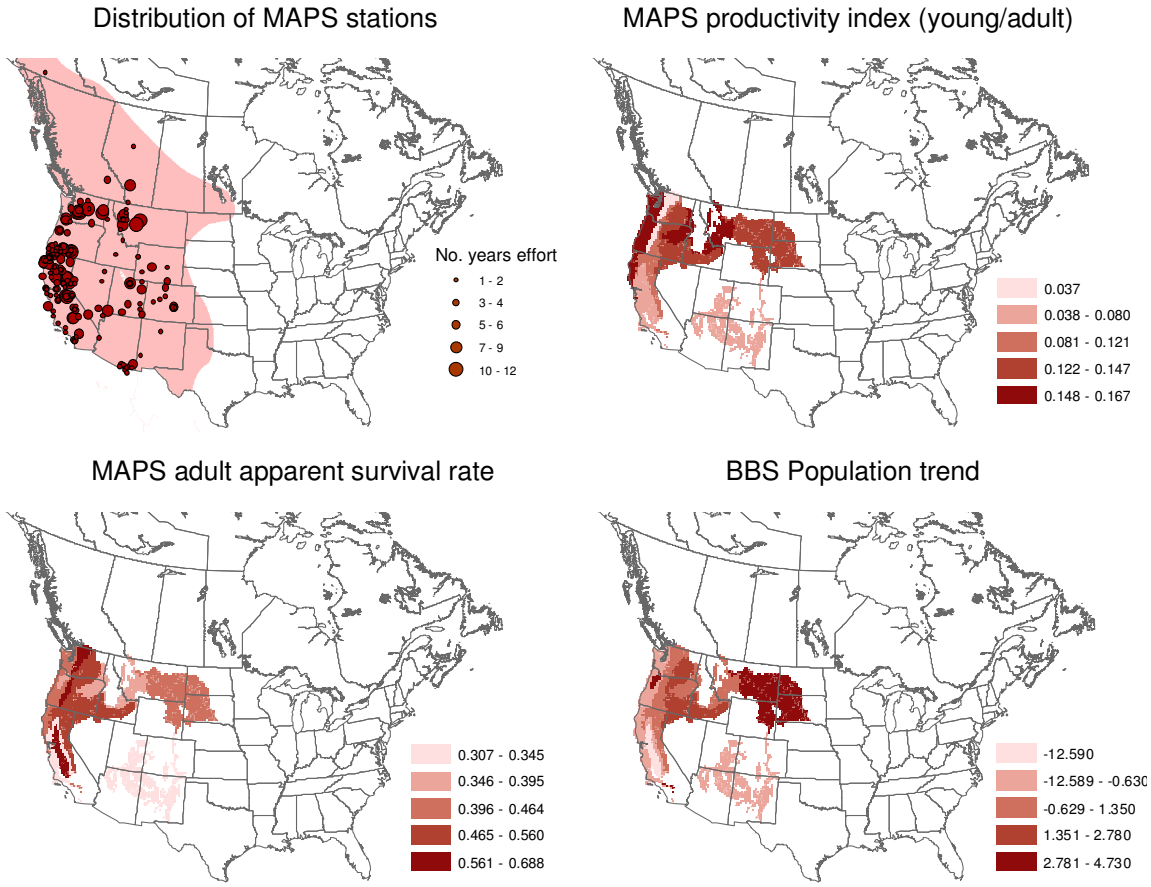

Figure 2. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Eastern Wood-Pewee (*Contopus virens*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Eastern Wood-Pewees and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

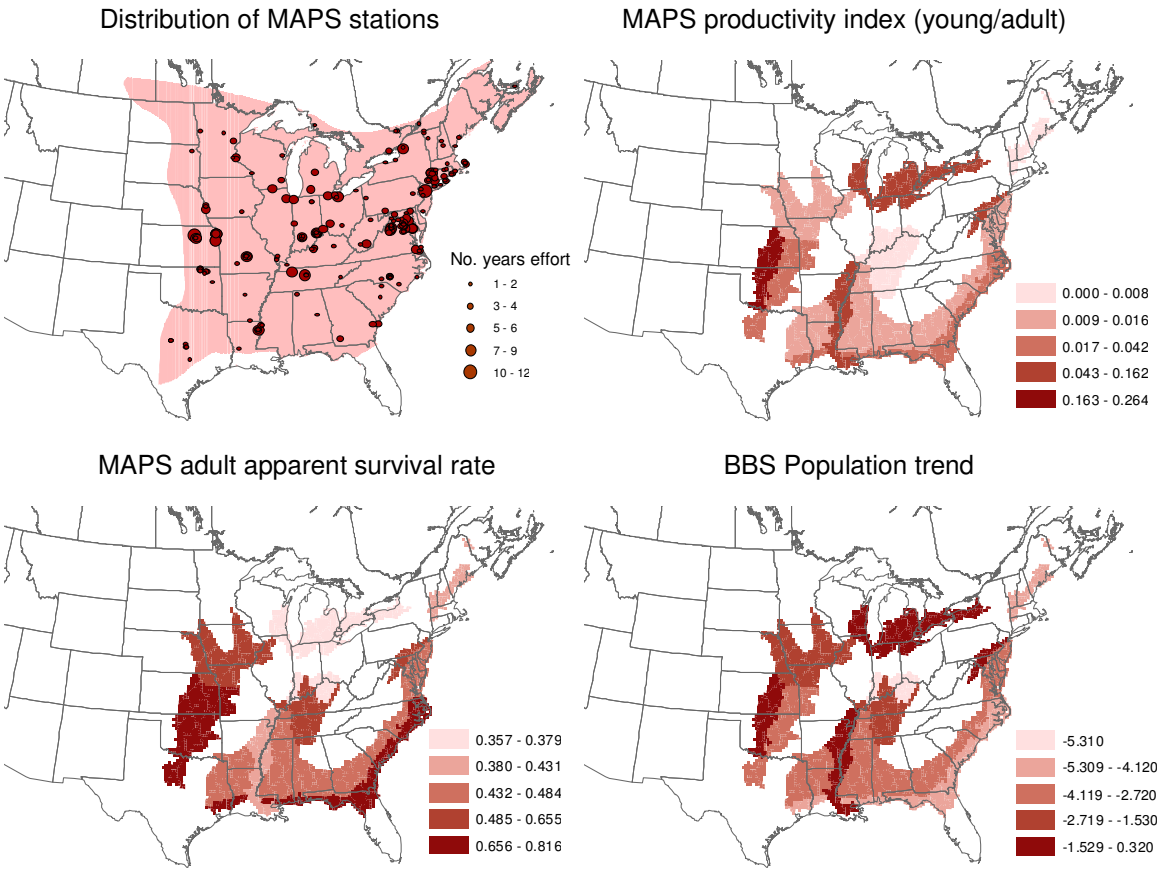

Figure 3. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Acadian Flycatcher (*Empidonax virescens*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Acadian Flycatchers and the location of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

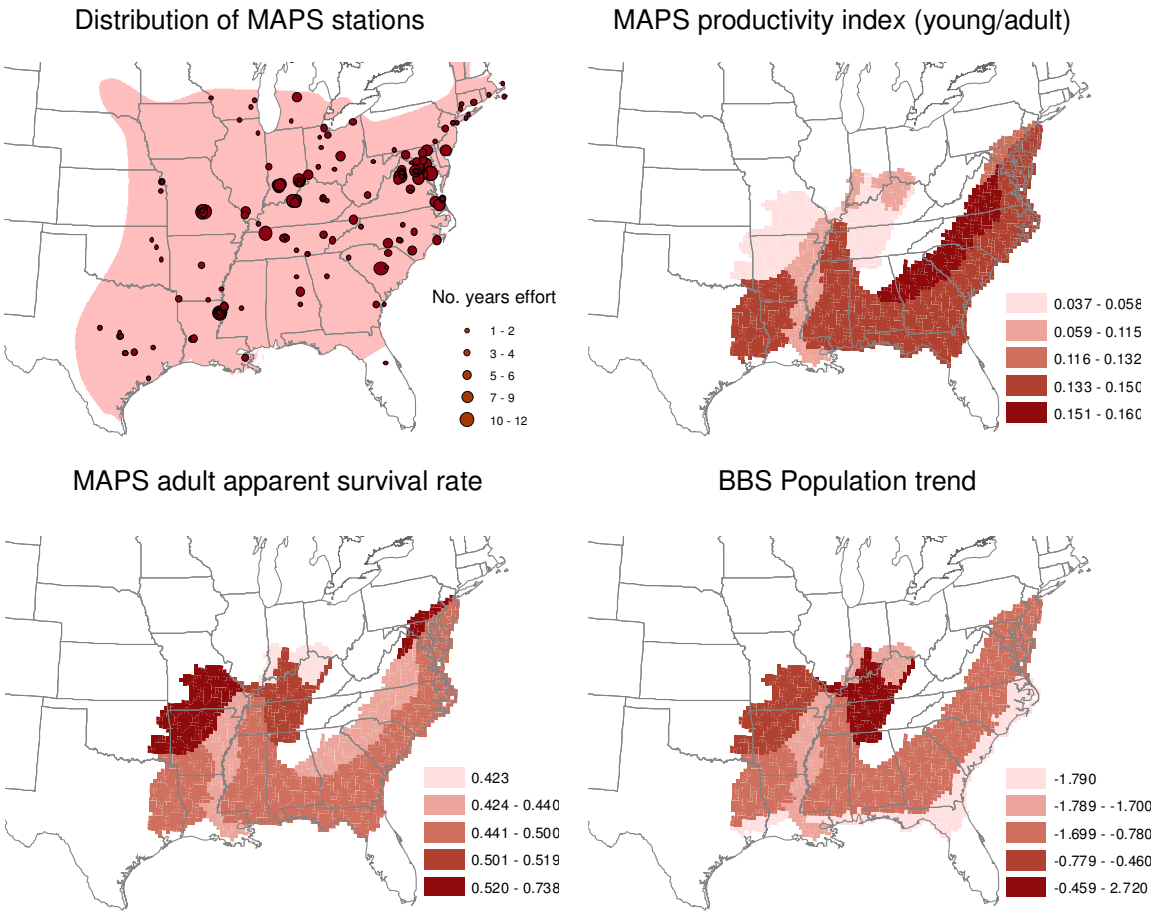

Figure 4. MAPS time-constant (1992-2003) vital rates and BBS population trends for **"Trail's" (Willow/Alder) Flycatcher (*Empidonax trailii/alnorum*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Trail's Flycatchers and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

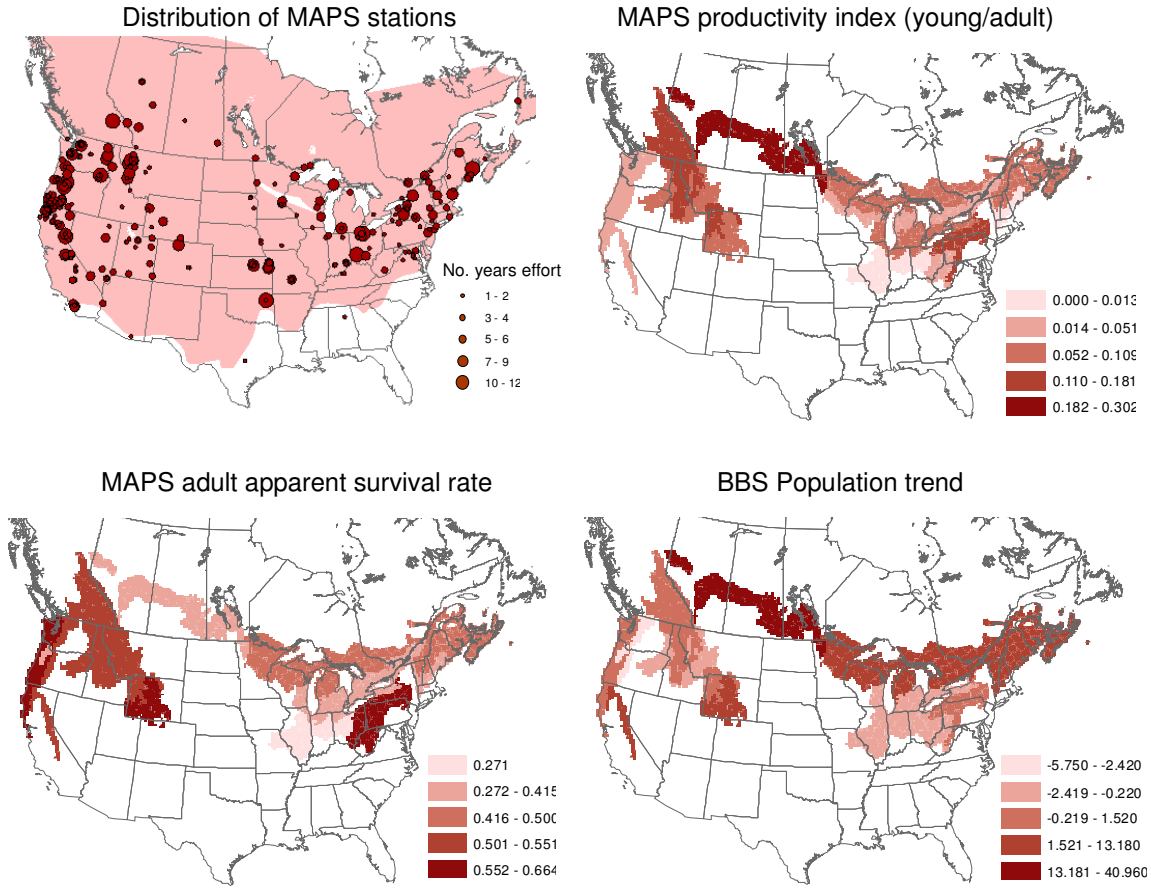

Figure 5. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Hammond's Flycatcher (*Empidonax hammondii*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Hammond's Flycatchers and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

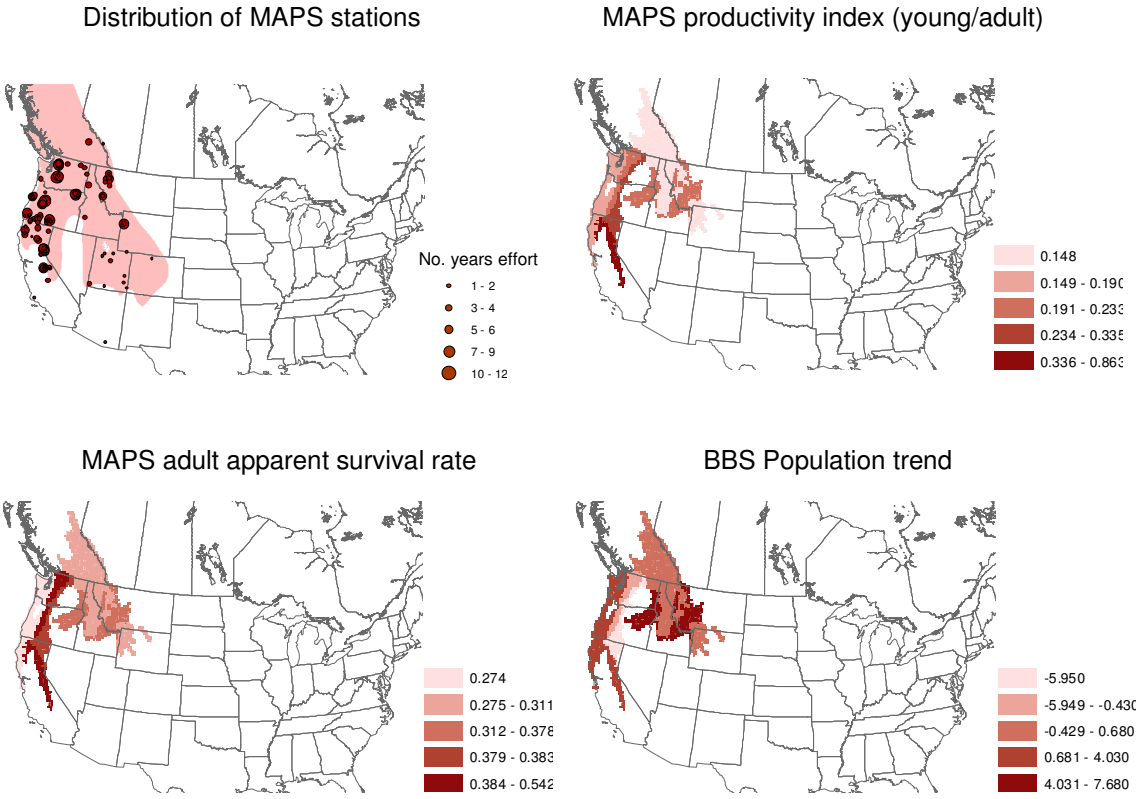

Figure 6. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Dusky Flycatcher (*Empidonax oberholseri*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Dusky Flycatchers and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

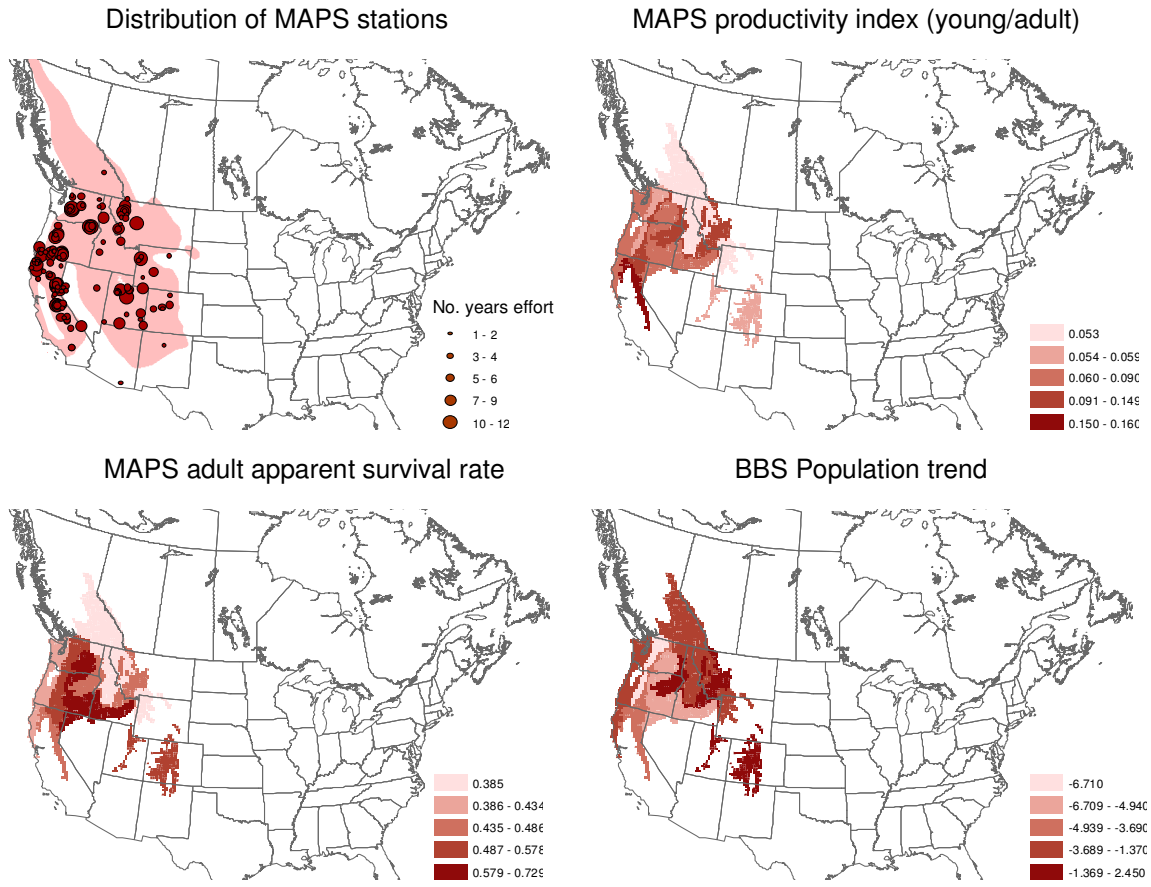

Figure 7. MAPS time-constant (1992-2003) vital rates and BBS population trends for **"Western" Flycatcher (*Empidonax difficilis/occidentalis*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Western Flycatchers and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

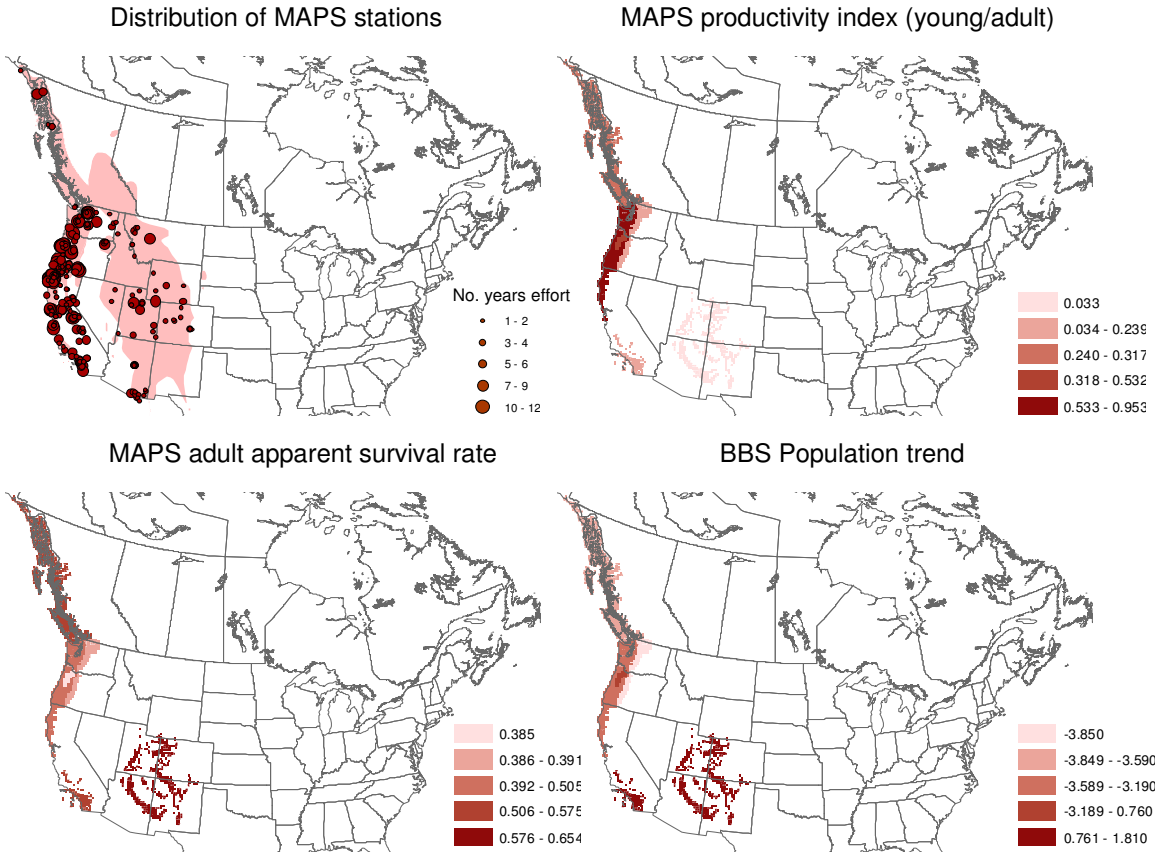

Figure 8. MAPS time-constant (1992-2003) vital rates and BBS population trends for **White-eyed Vireo (*Vireo griseus*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of White-eyed Vireos and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

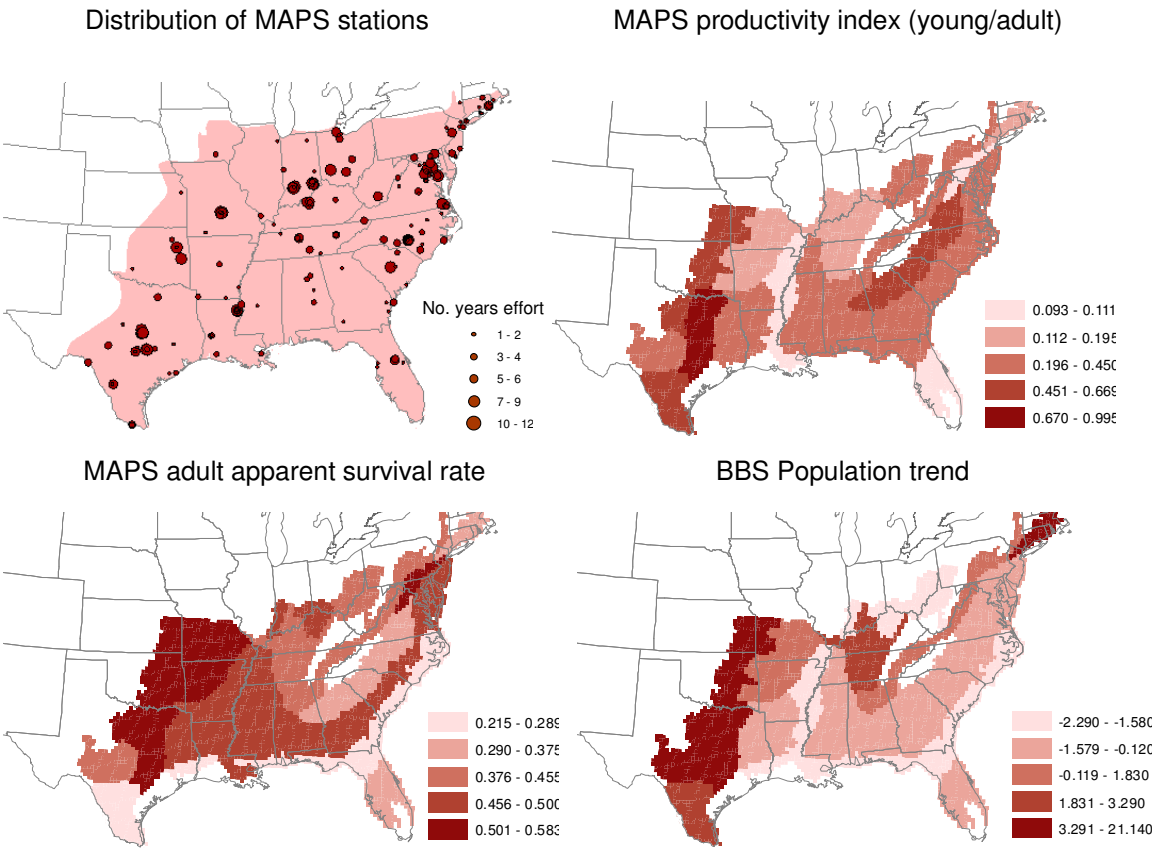

Figure 9. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Bell's Vireo (*Vireo bellii*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Bell's Vireos and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

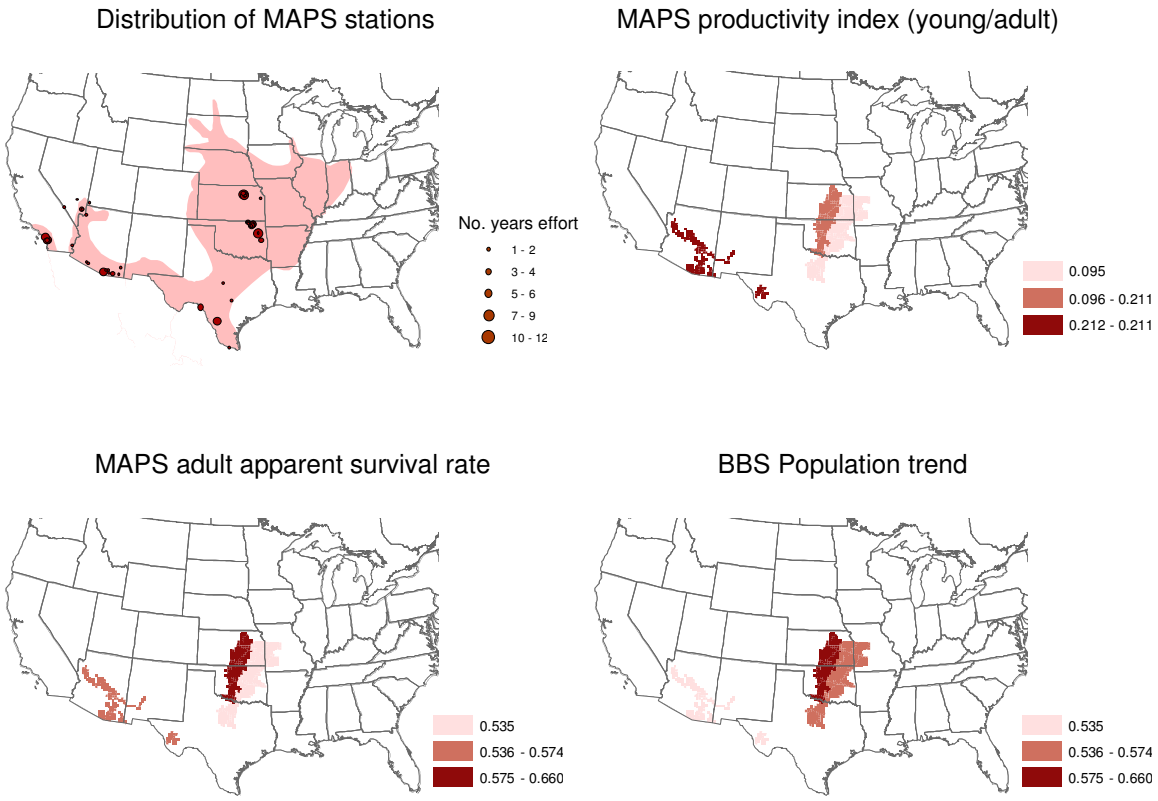

Figure 10. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Warbling Vireo (*Vireo gilvus*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of WarblingVireos and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

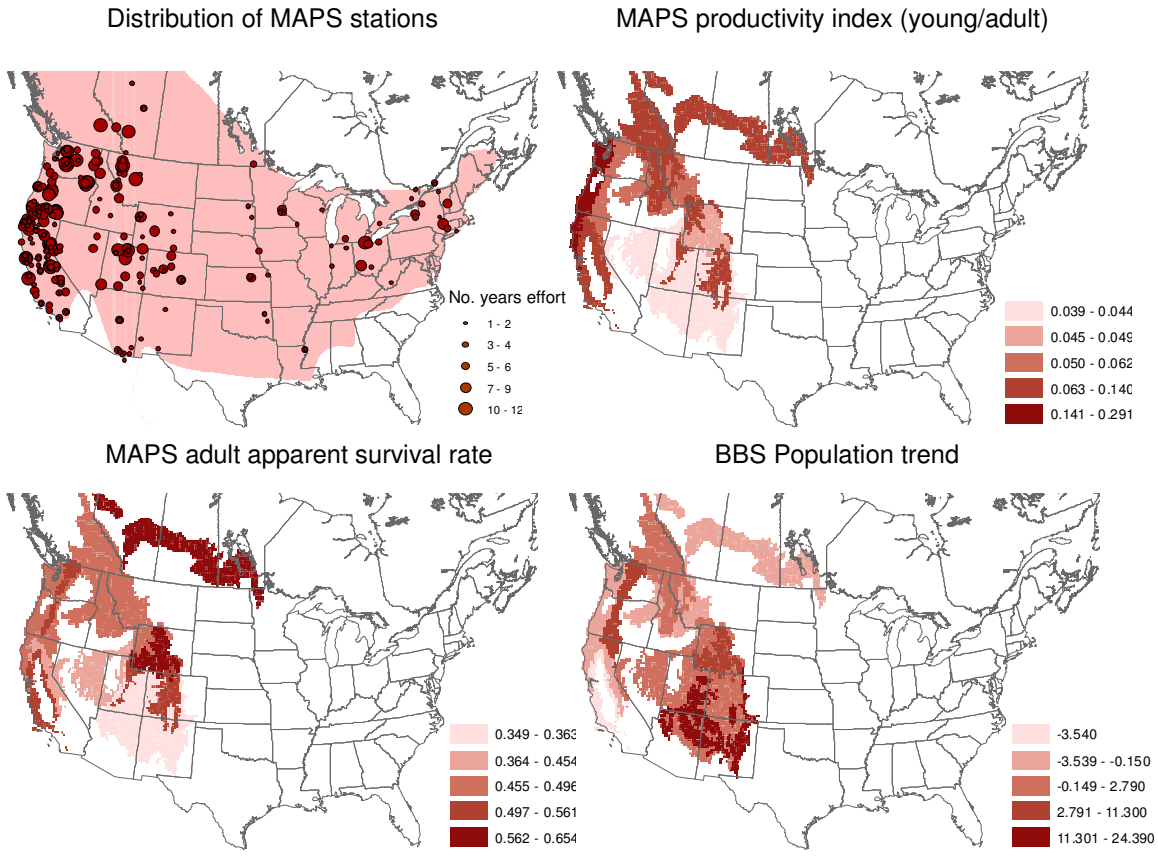

Figure 11. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Red-eyed Vireo (*Vireo olivaceus*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Red-eyedVireos and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

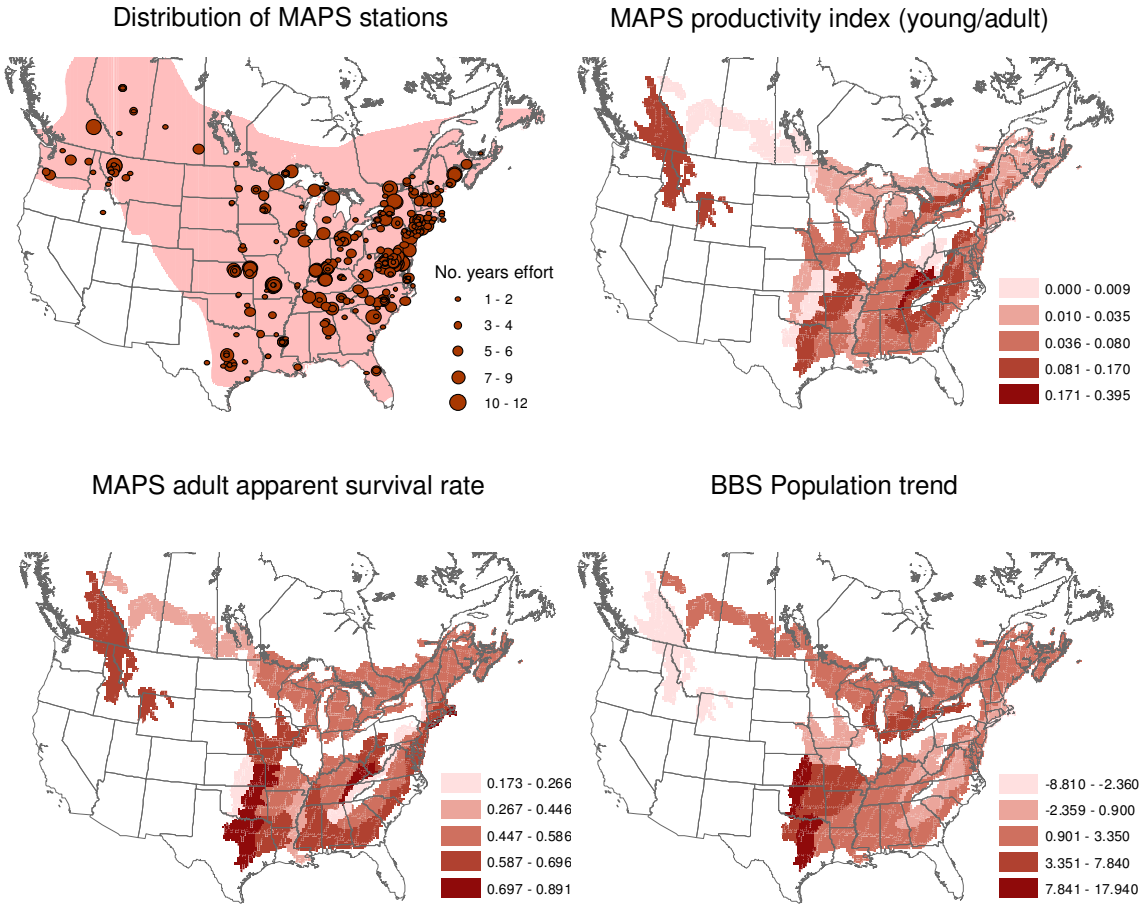

Figure 12. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Veery (*Catharus fuscescens*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Veery and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

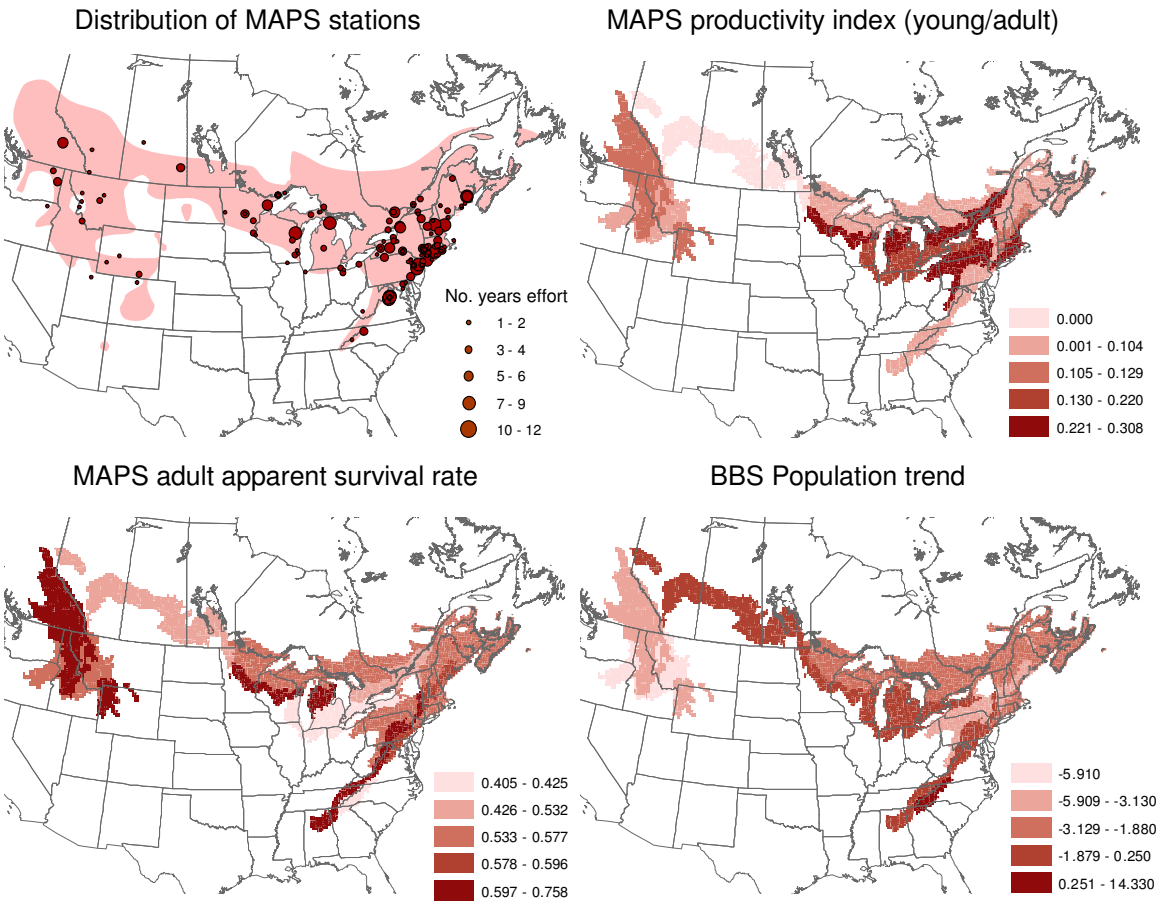

Figure 13. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Swainson's Thrush (*Catharus ustulatus*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Swainson's Thrush and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented. (Note that MAPS stations are extremely sparse in Boreal Canada and Alaska.)

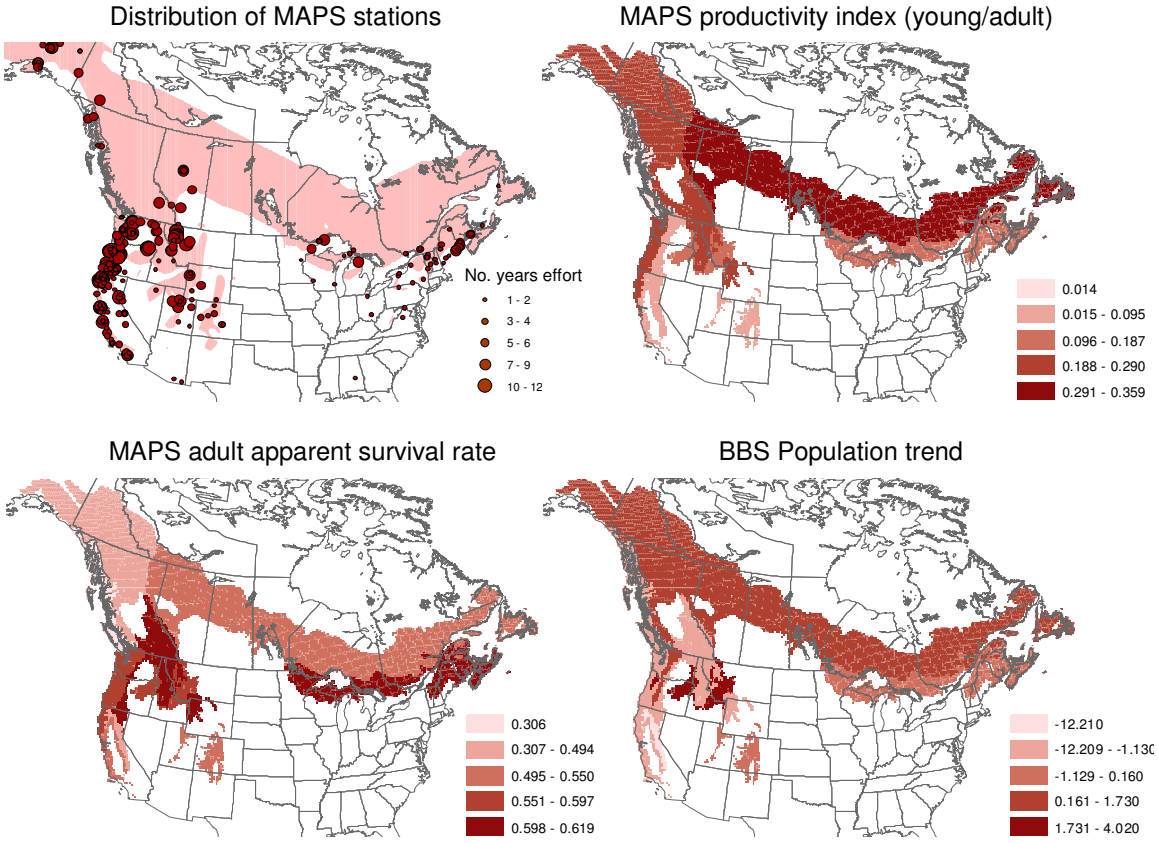

Figure 14. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Wood Thrush (*Hylocichla mustelina*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Wood Thrush and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

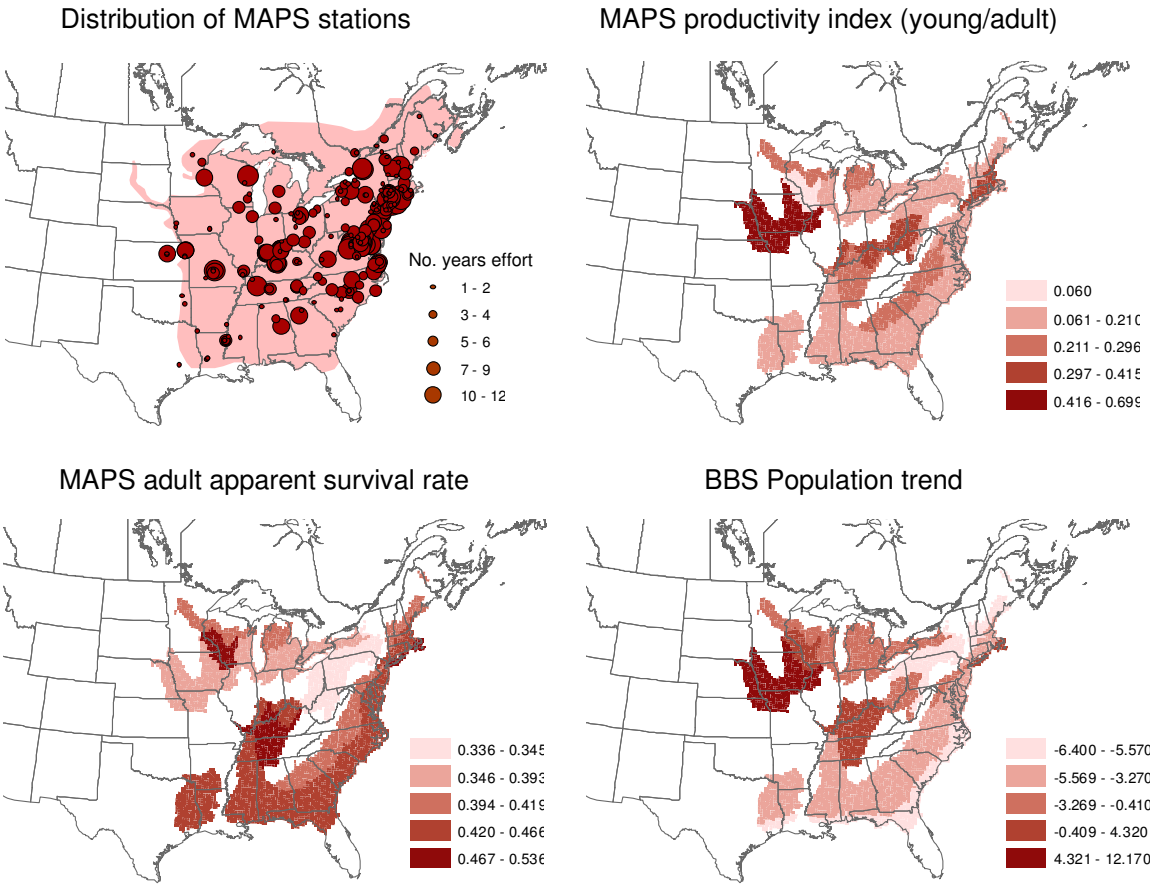

Figure 15. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Gray Catbird (*Dumetella carolinensis*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Gray Catbird and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

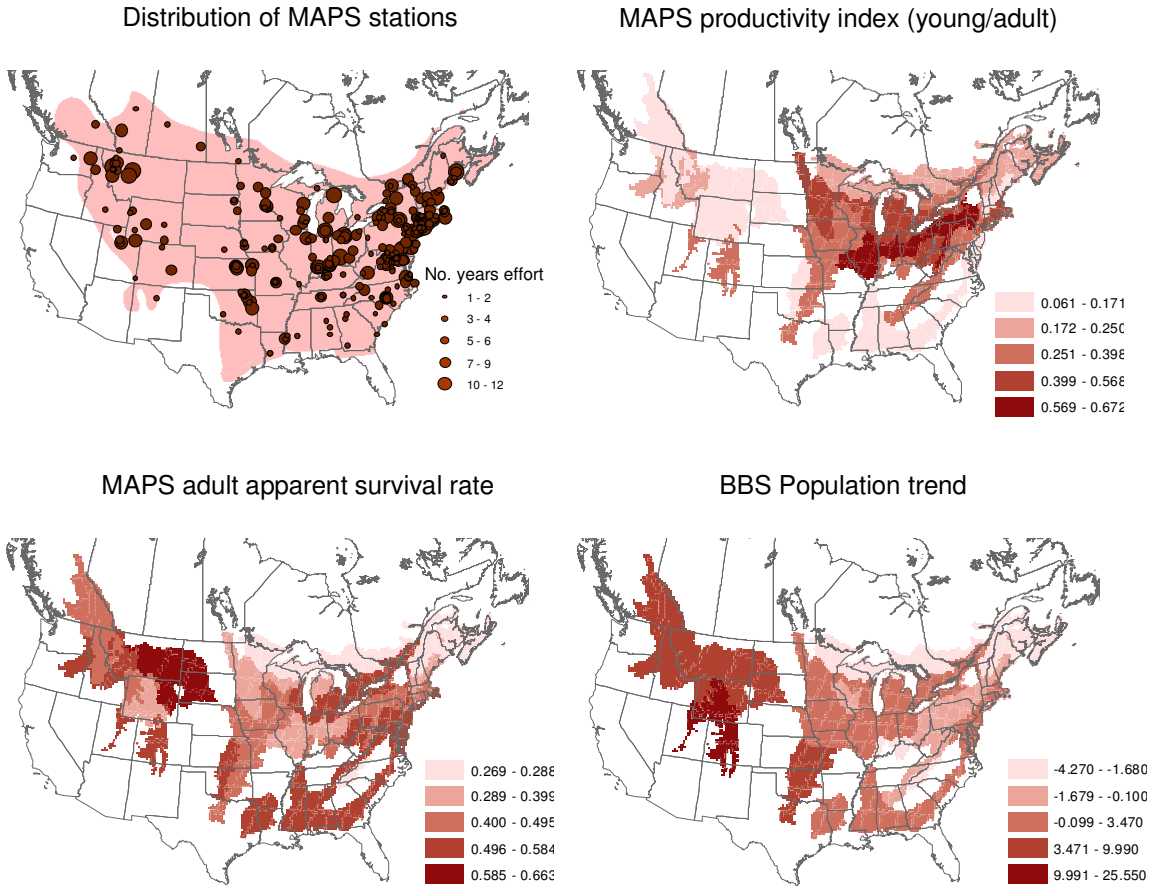

Figure 16. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Blue-winged Warbler (*Vermivora pinus*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Blue-winged Warblers and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

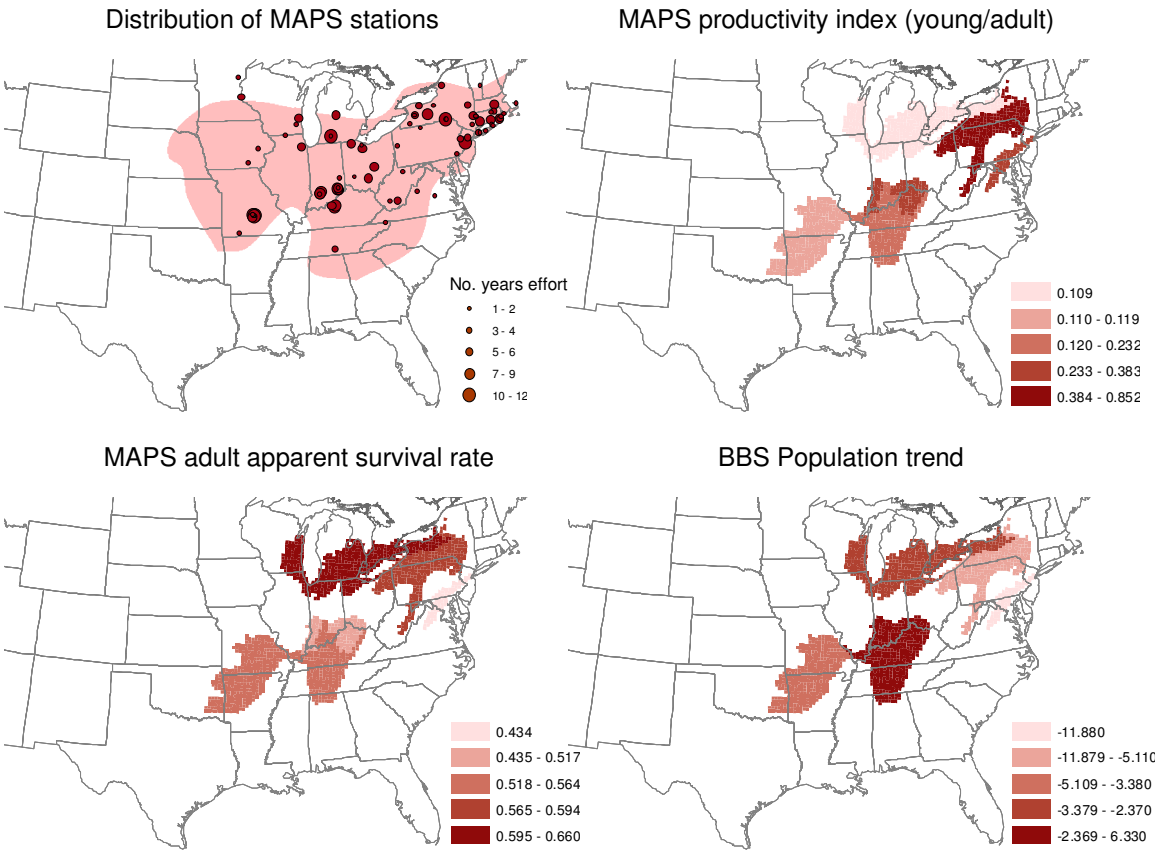

Figure 17. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Orange-crowned Warbler (*Vermivora celata*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Orange-crowned Warblers and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

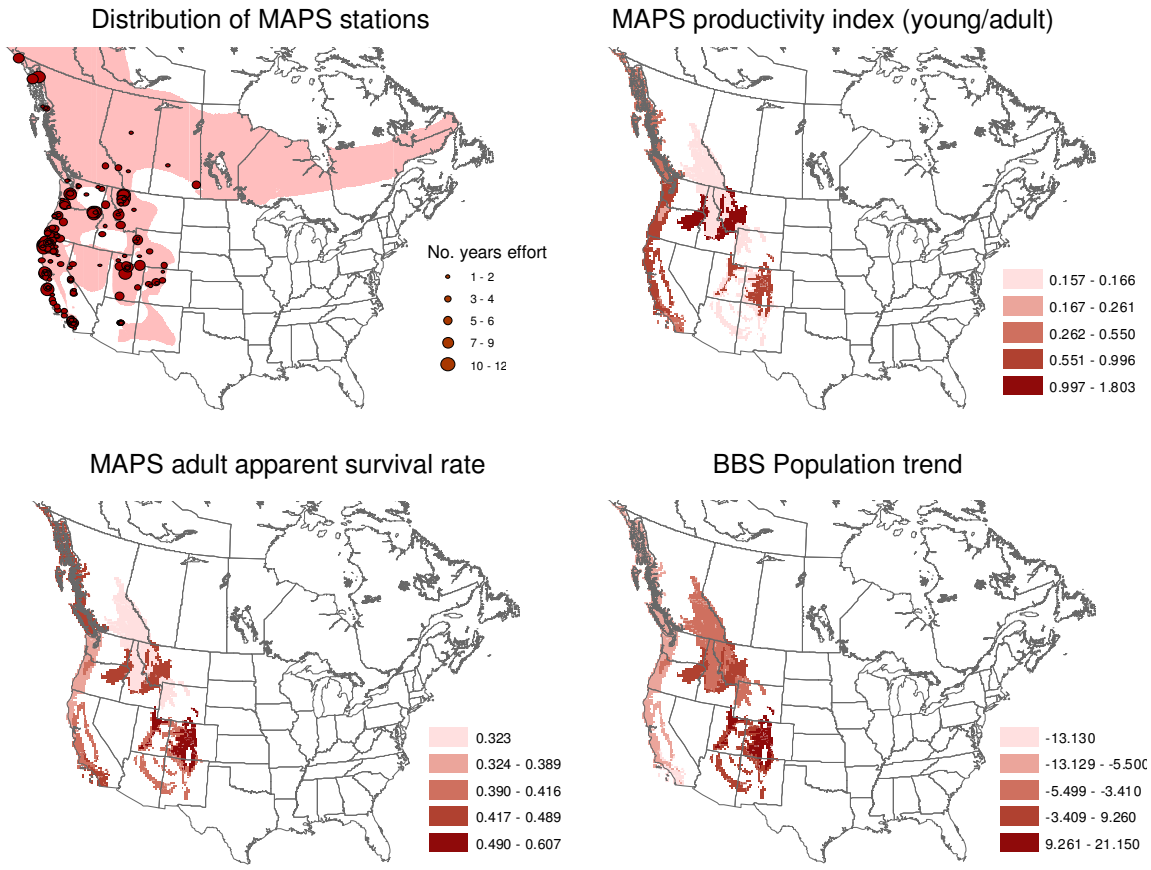

Figure 18. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Yellow Warbler (*Dendroica petechia*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Yellow Warblers and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

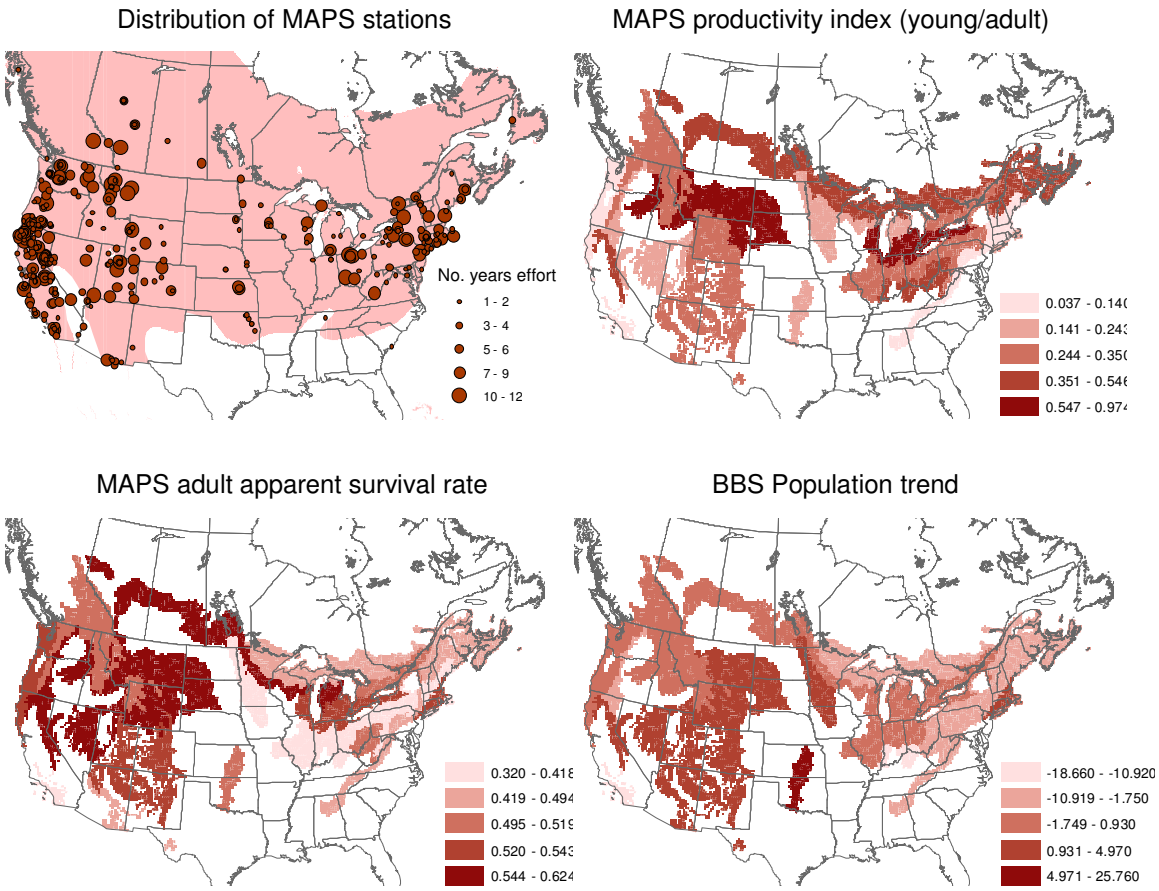

Figure 19. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Chestnut-sided Warbler (*Dendroica pensylvanica*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Chestnut-sided Warblers and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

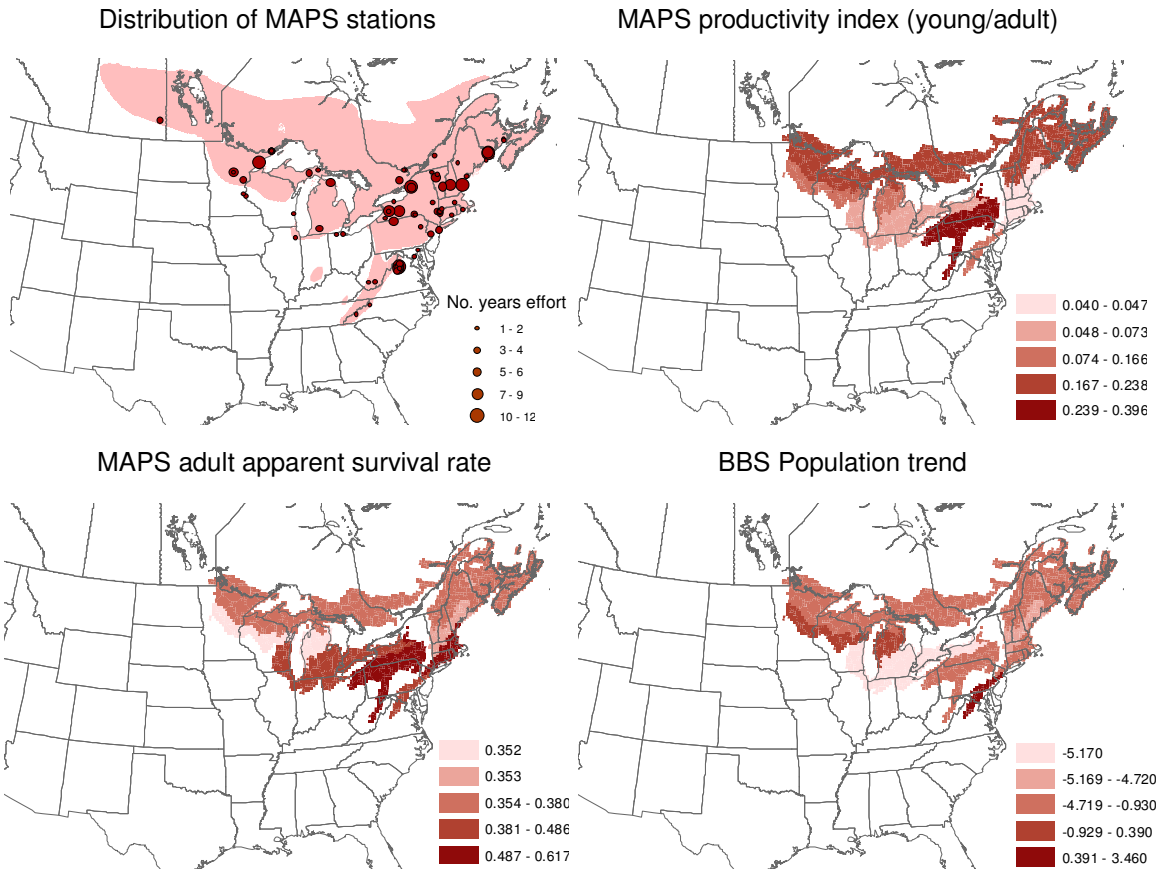

Figure 20. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Prairie Warbler (*Dendroica discolor*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Prairie Warblers and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

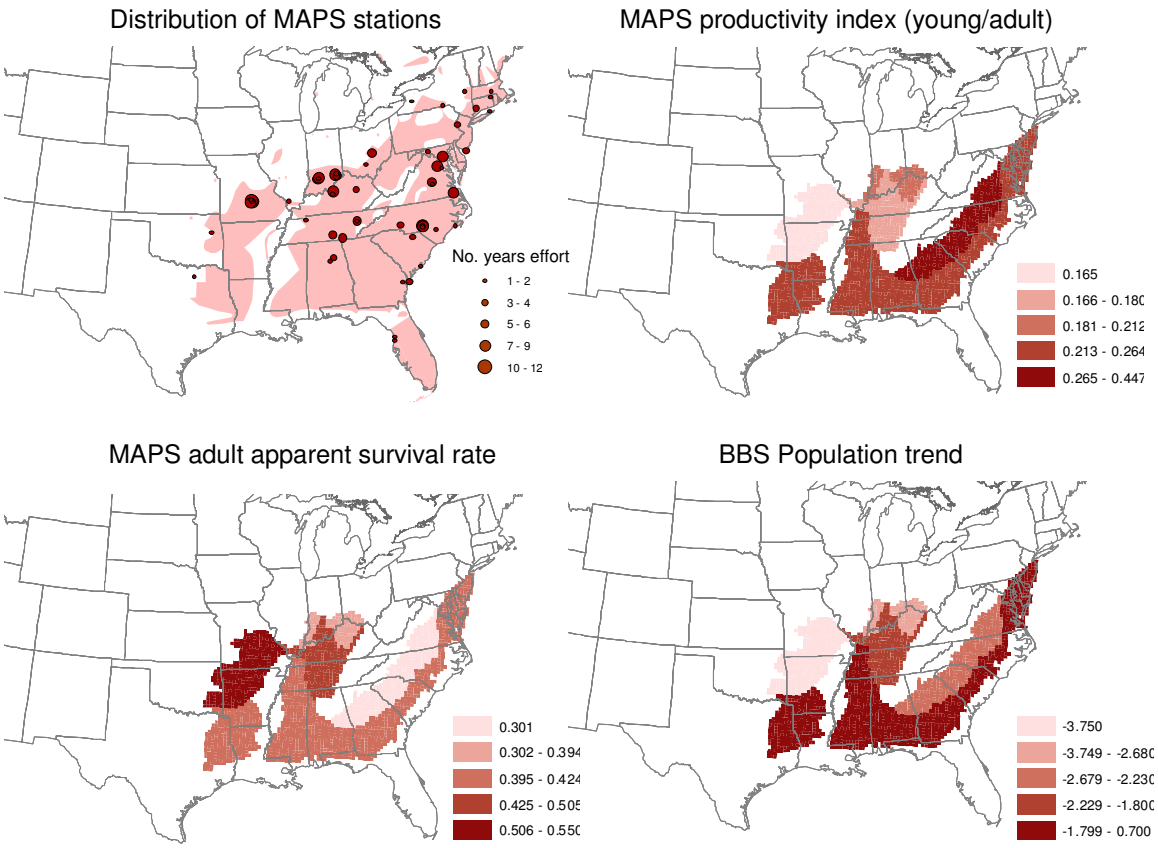

Figure 21. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Black-and-white Warbler (*Mniotilta varia*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Black-and-white Warblers and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

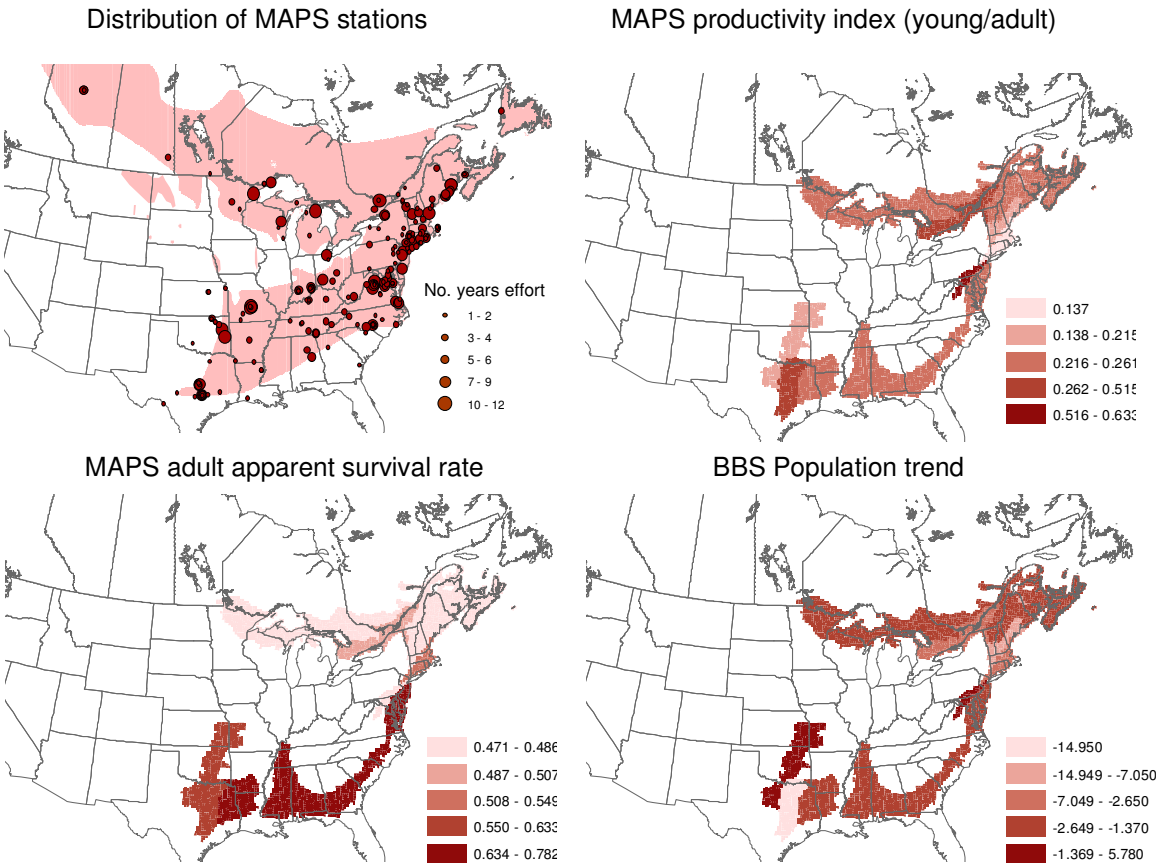

Figure 22. MAPS time-constant (1992-2003) vital rates and BBS population trends for **American Redstart (*Setophaga ruticilla*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of American Redstarts and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

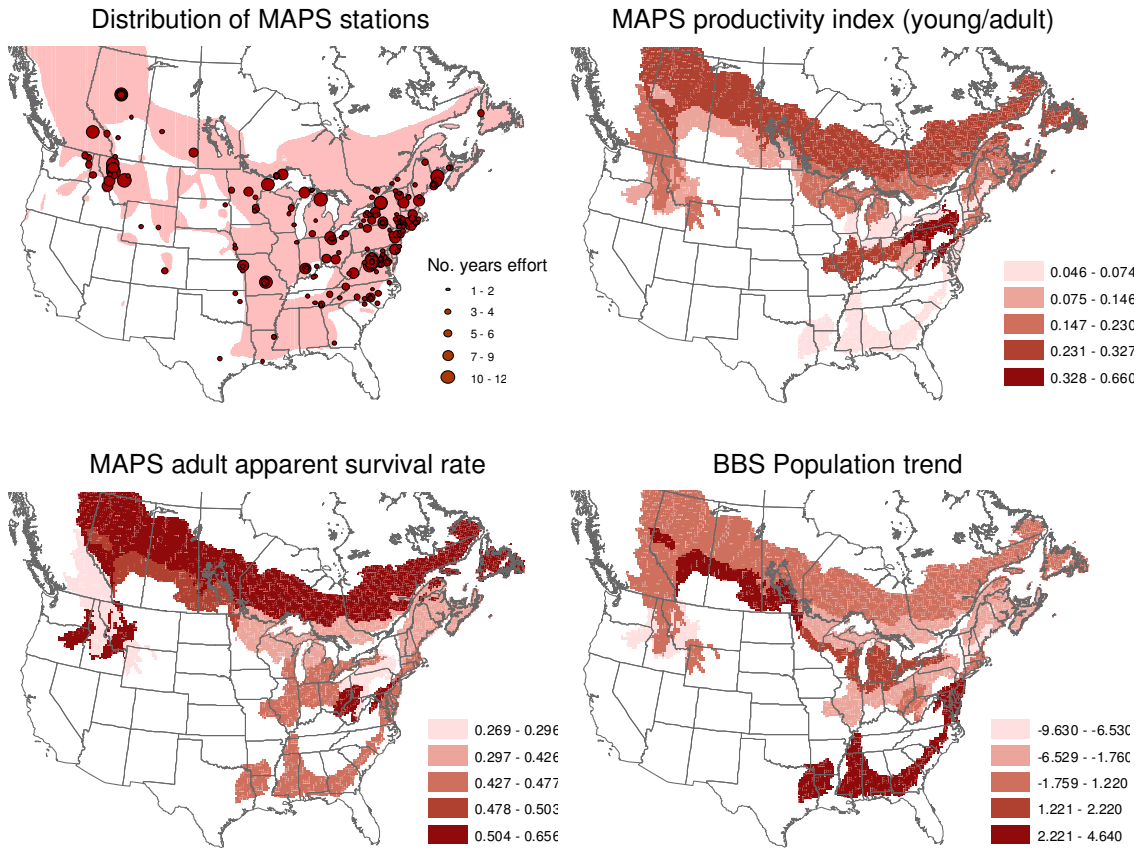

Figure 23. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Prothonotary Warbler (*Protonotaria citrea*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Worm-eating Warblers and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

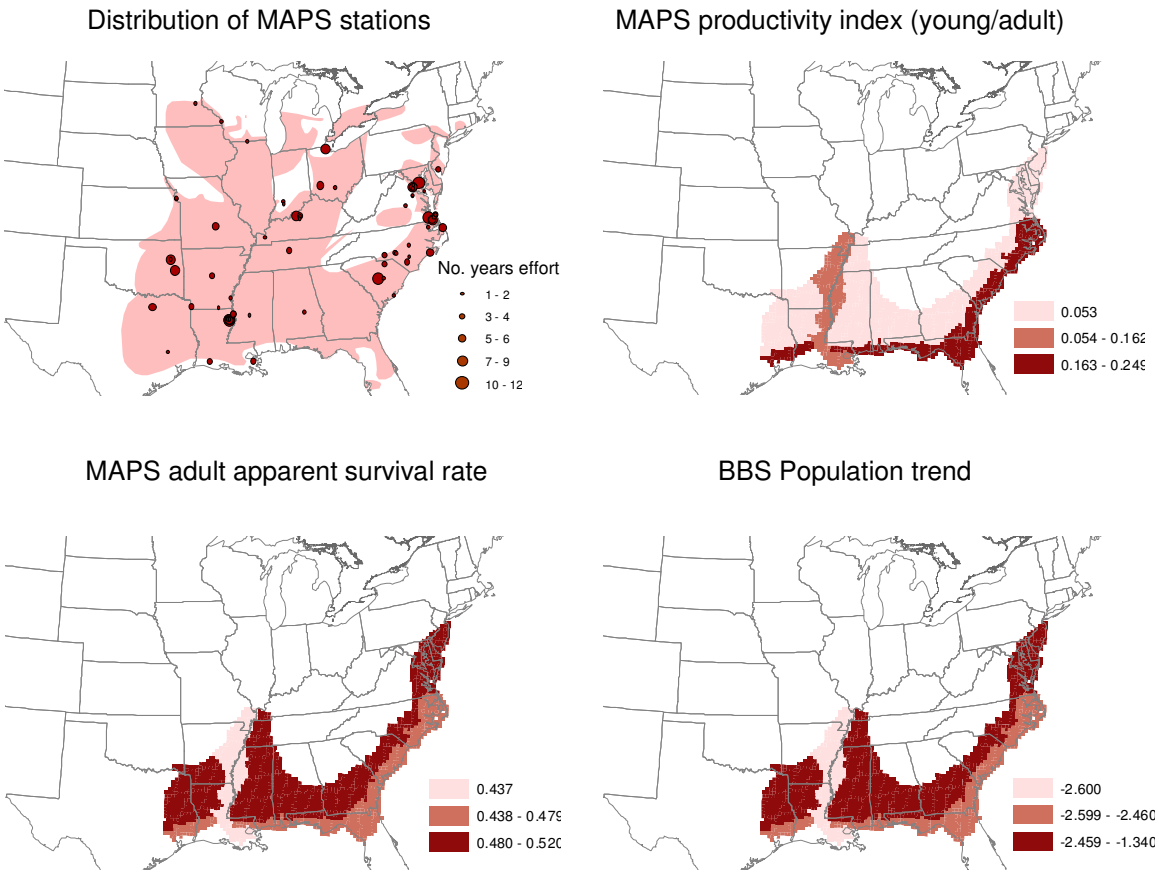

Figure 24. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Worm-eating Warbler (*Helmitheros vermivorus*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Worm-eating Warblers and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

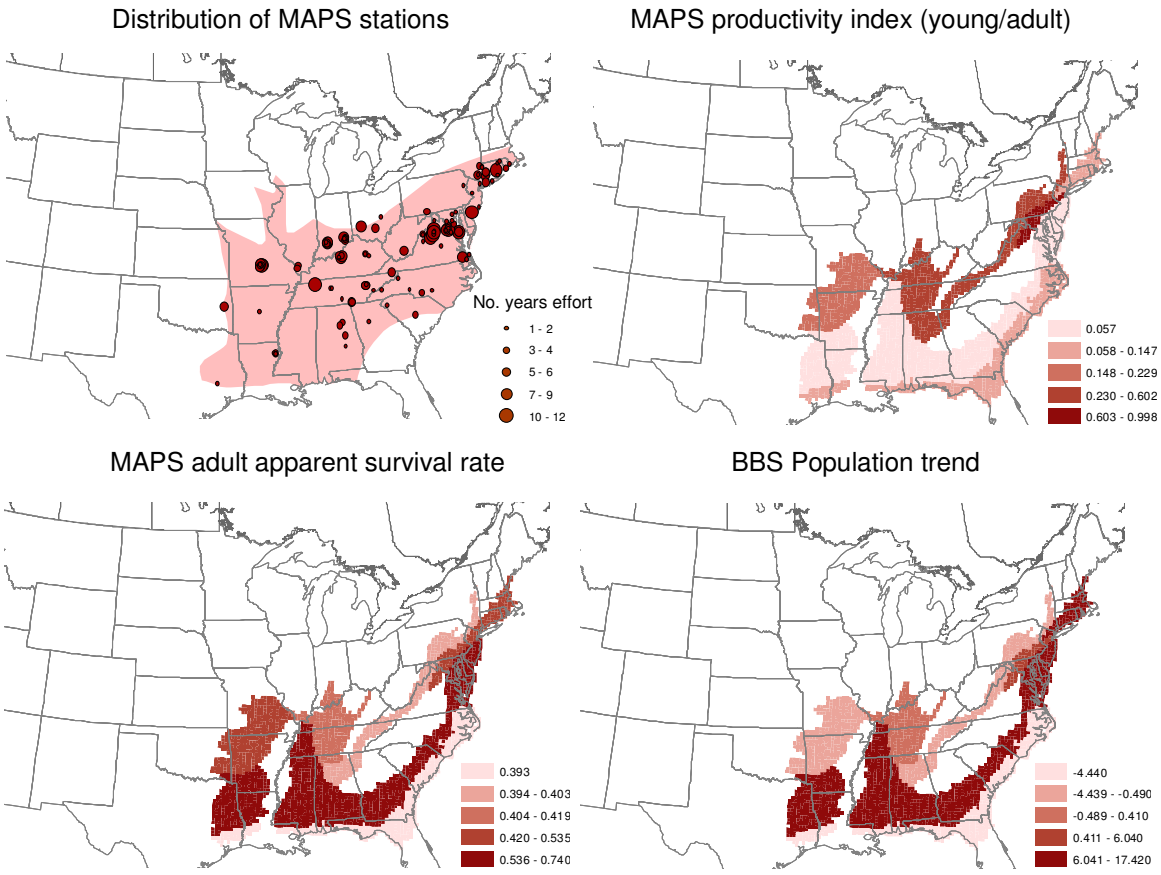

Figure 25. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Ovenbird (*Seiurus aurocapilla*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Ovenbirds and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

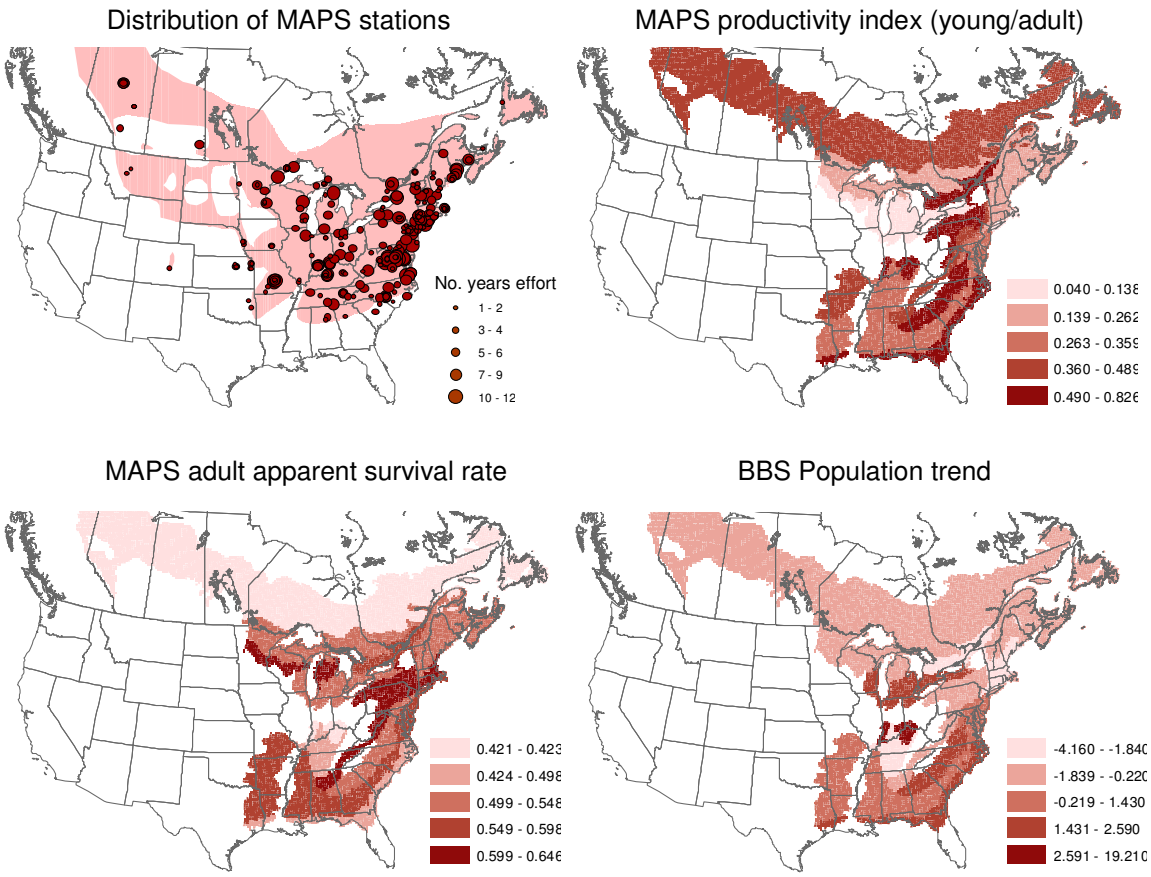

Figure 26. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Louisiana Waterthrush (*Seirus motacilla*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Louisiana Waterthrushes and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

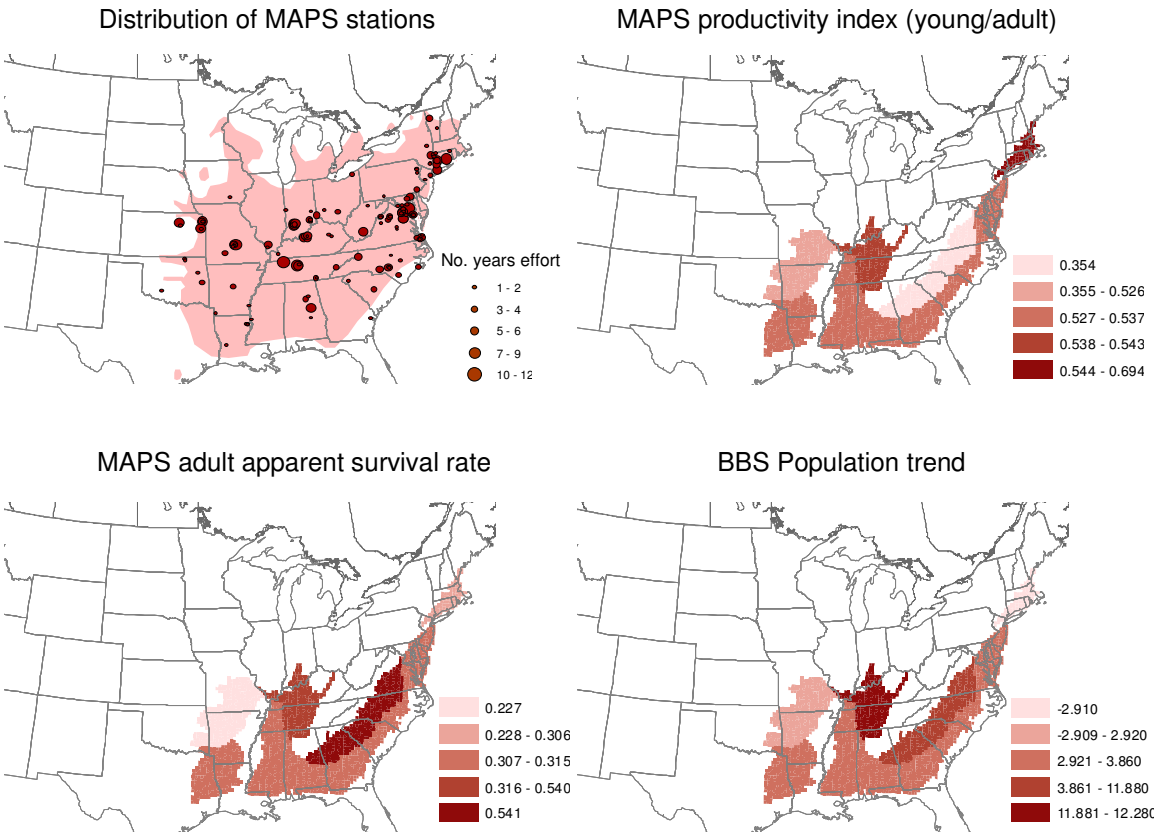

Figure 27. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Kentucky Warbler (*Oporornis formosus*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Kentucky Warblers and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

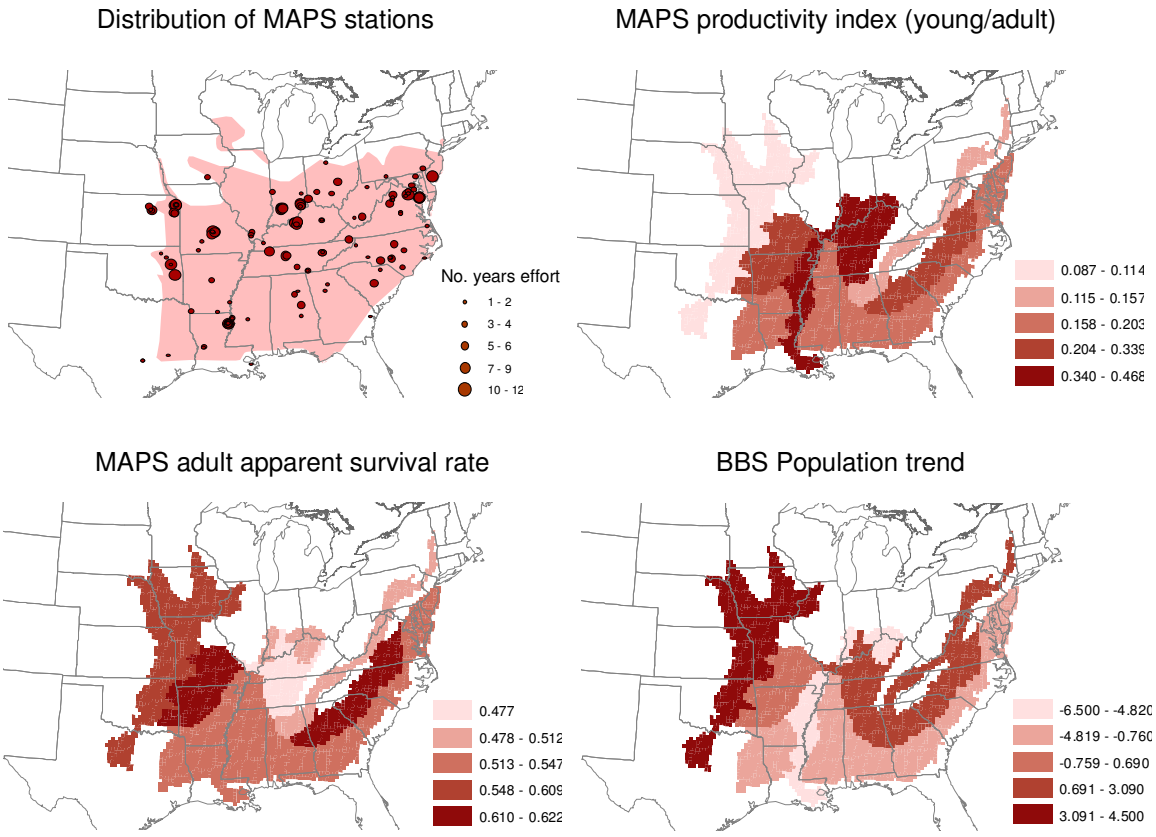

Figure 28. MAPS time-constant (1992-2003) vital rates and BBS population trends for **MacGillivray's Warbler (*Oporornis tolmei*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of MacGillivray's Warblers and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

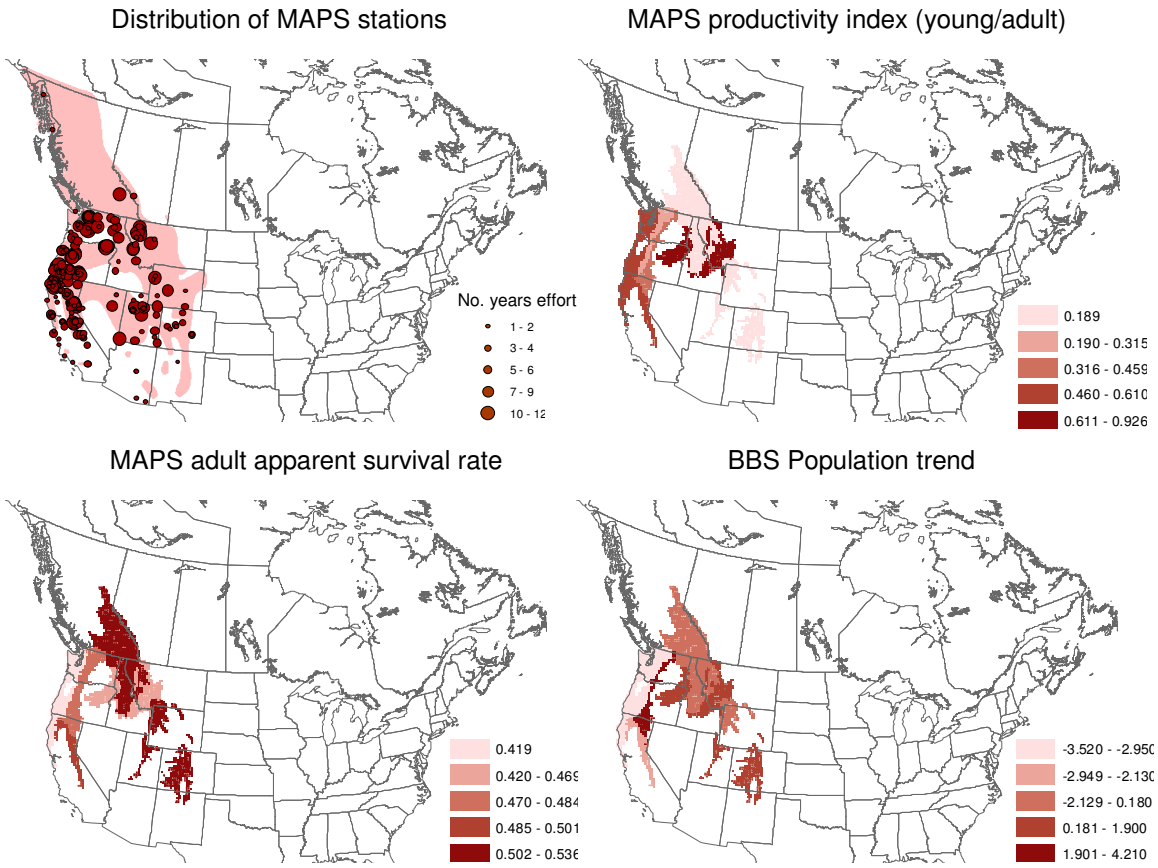

Figure 29. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Common Yellowthroat (*Geothlipis trichis*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Common Yellowthroats and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

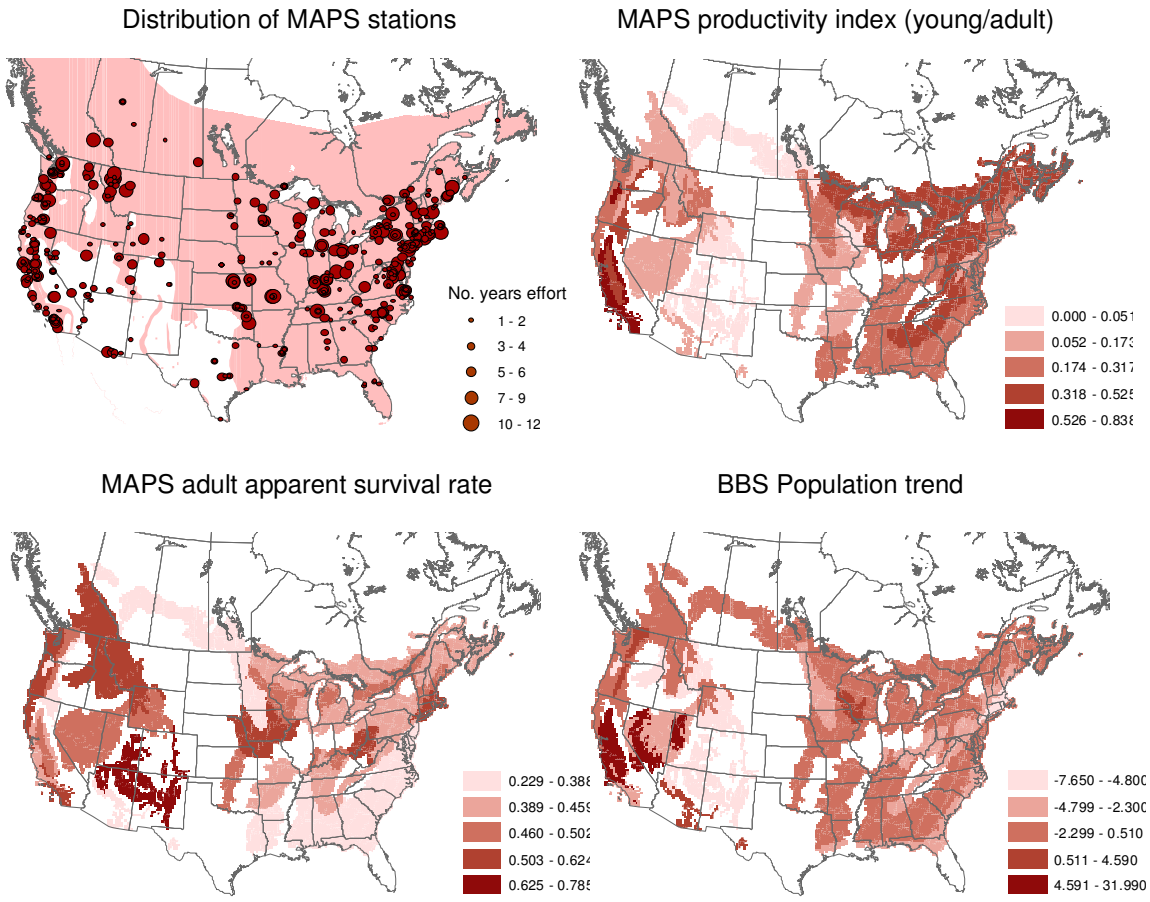

Figure 30. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Hooded Warbler (*Wilsonia citrina*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Hooded Warblers and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

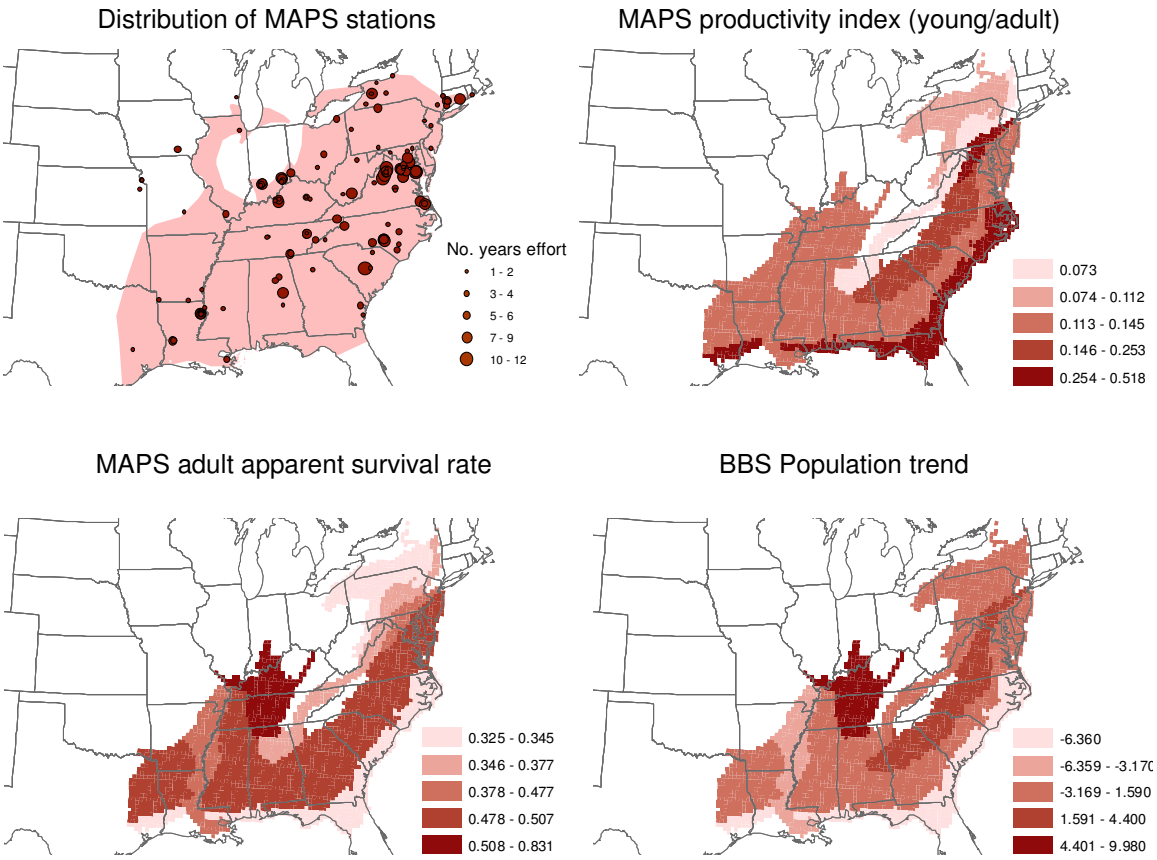

Figure 31. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Wilson's Warbler (*Wilsonia pusilla*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Wilson's Warblers and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

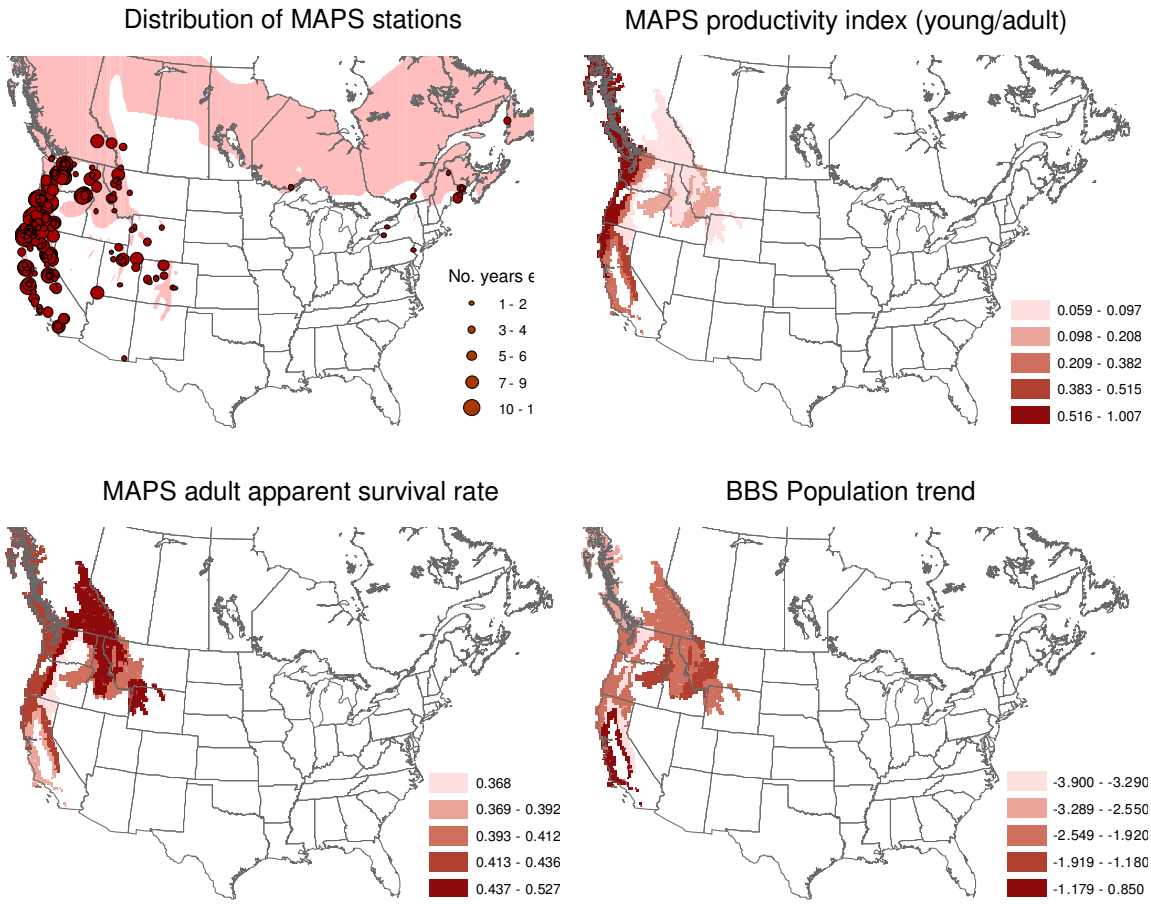

Figure 32. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Yellow-breasted Chat (*Icteria virens*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Yellow-breasted Chats and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

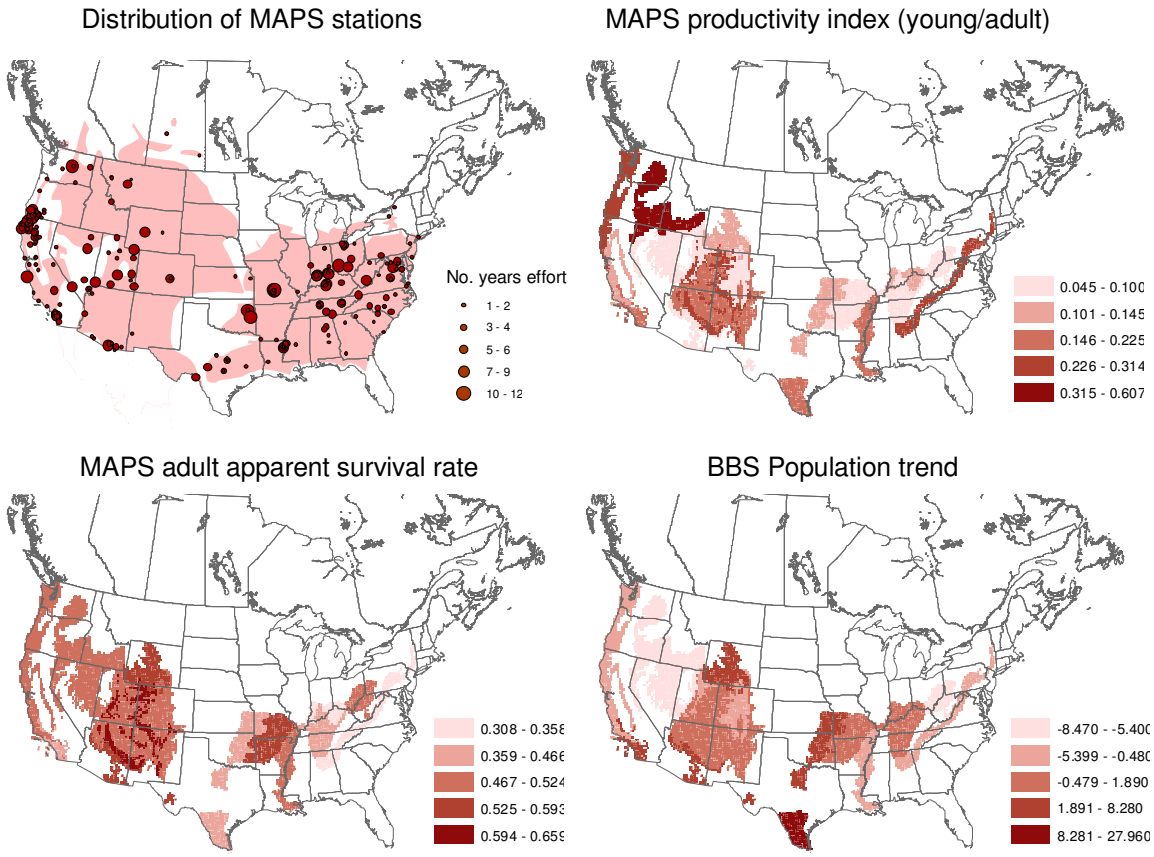

Figure 33. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Chipping Sparrow (*Spizella passerina*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Chipping Sparrows and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

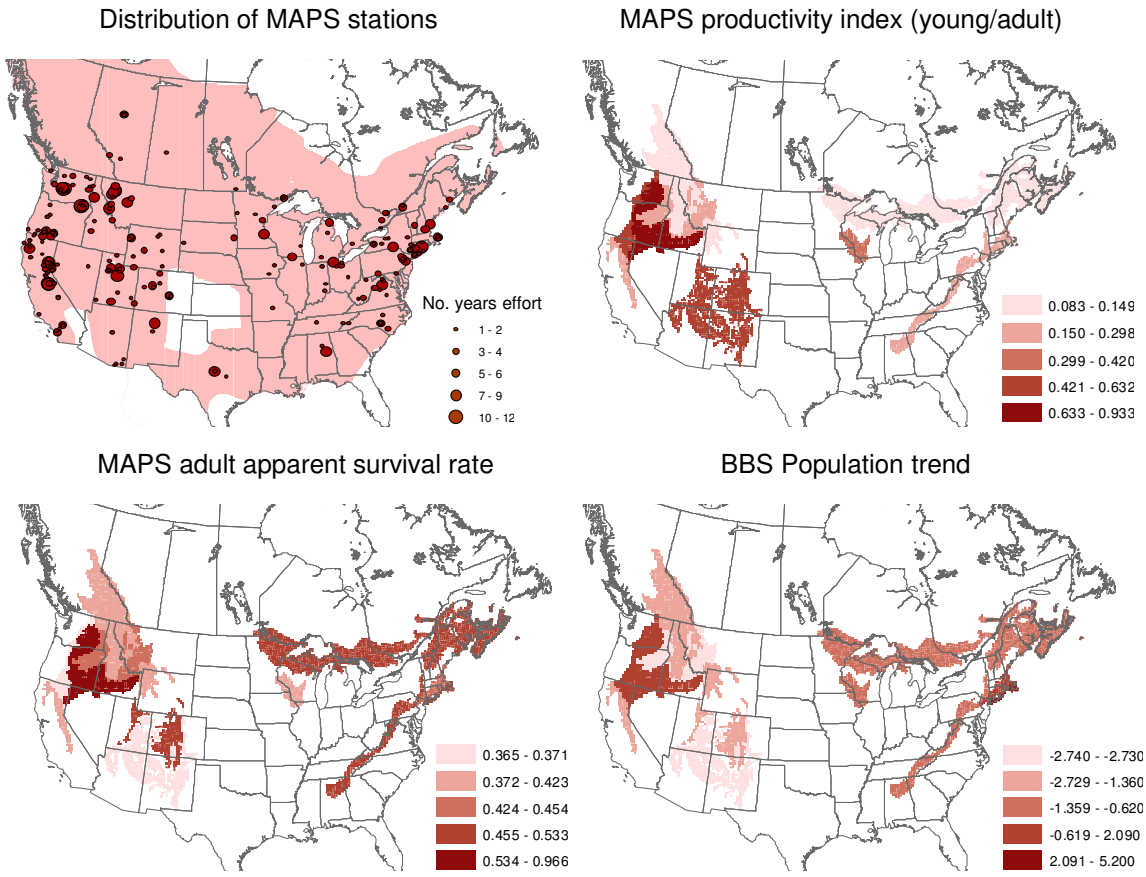

Figure 34. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Black-headed Grosbeak (*Pheucticus melanocephalus*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Black-headed Grosbeaks and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

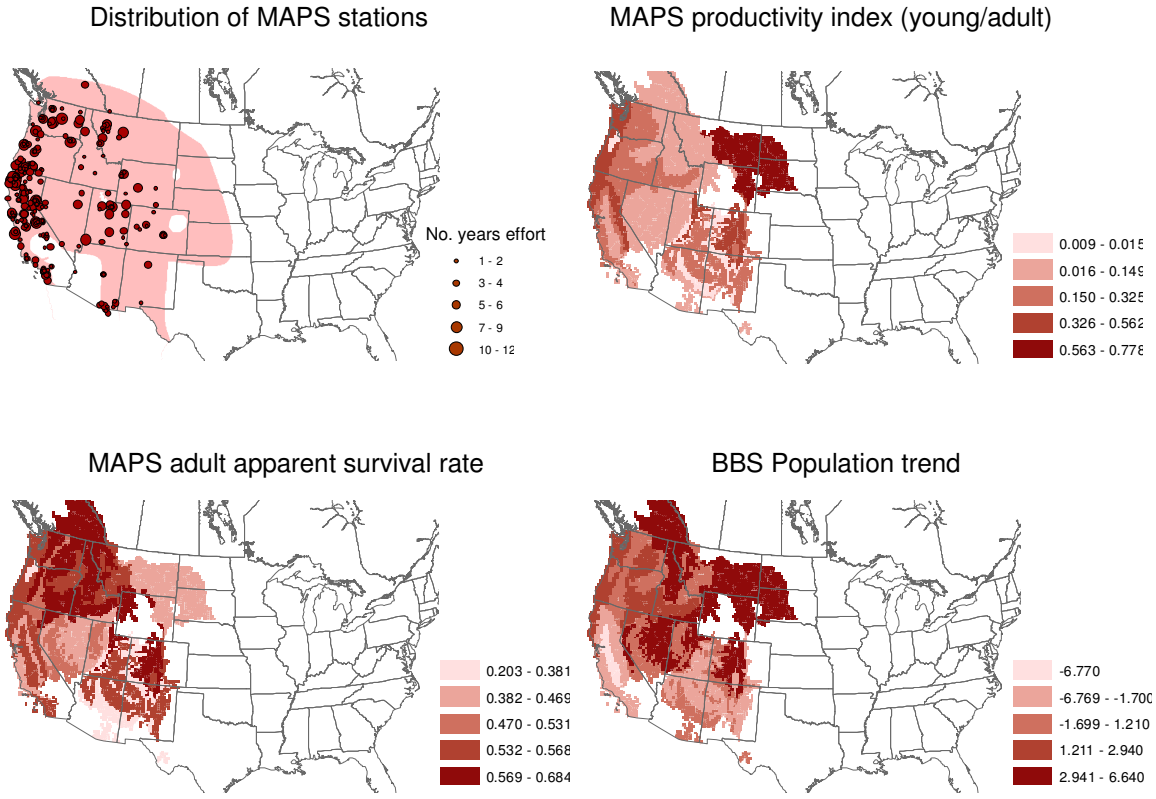

Figure 35. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Lazuli Bunting (*Passerina amoena*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Lazuli Buntings and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

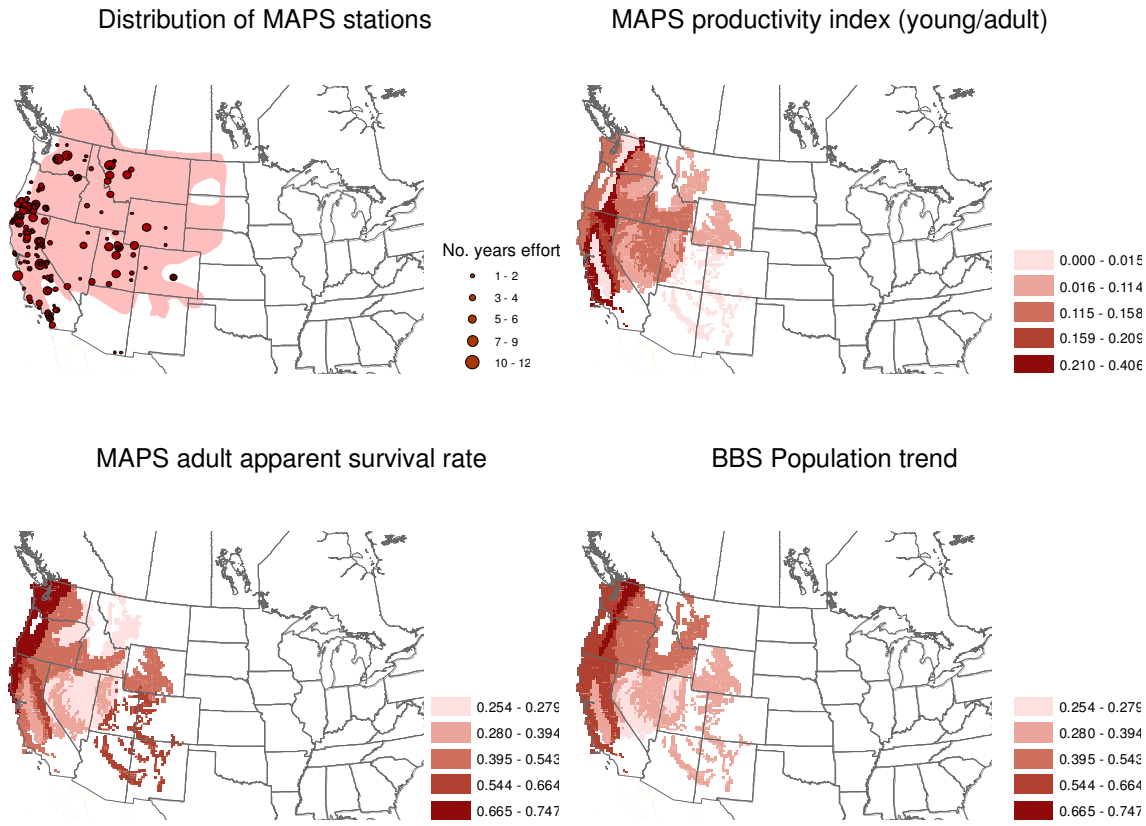

Figure 36. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Indigo Bunting (*Passerina cyanea*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Indigo Buntings and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

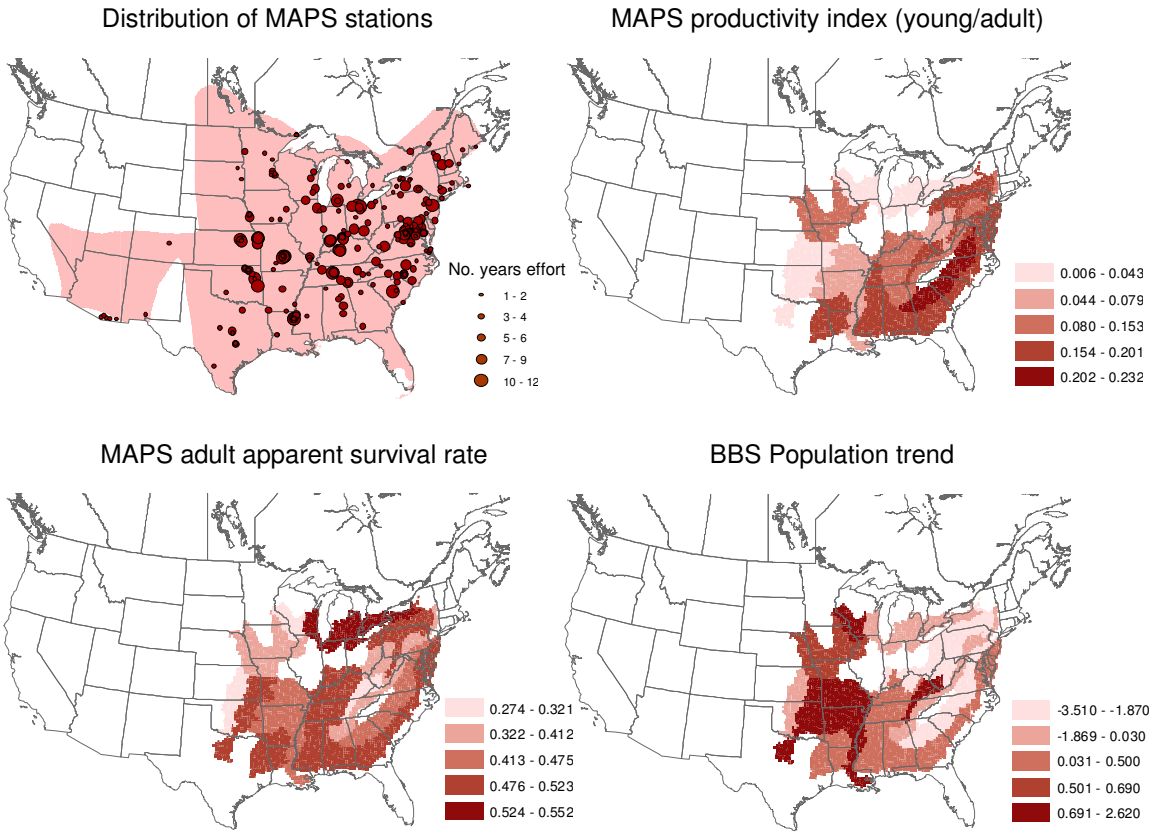

Figure 37. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Painted Bunting (*Passerina ciris*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Painted Buntings and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

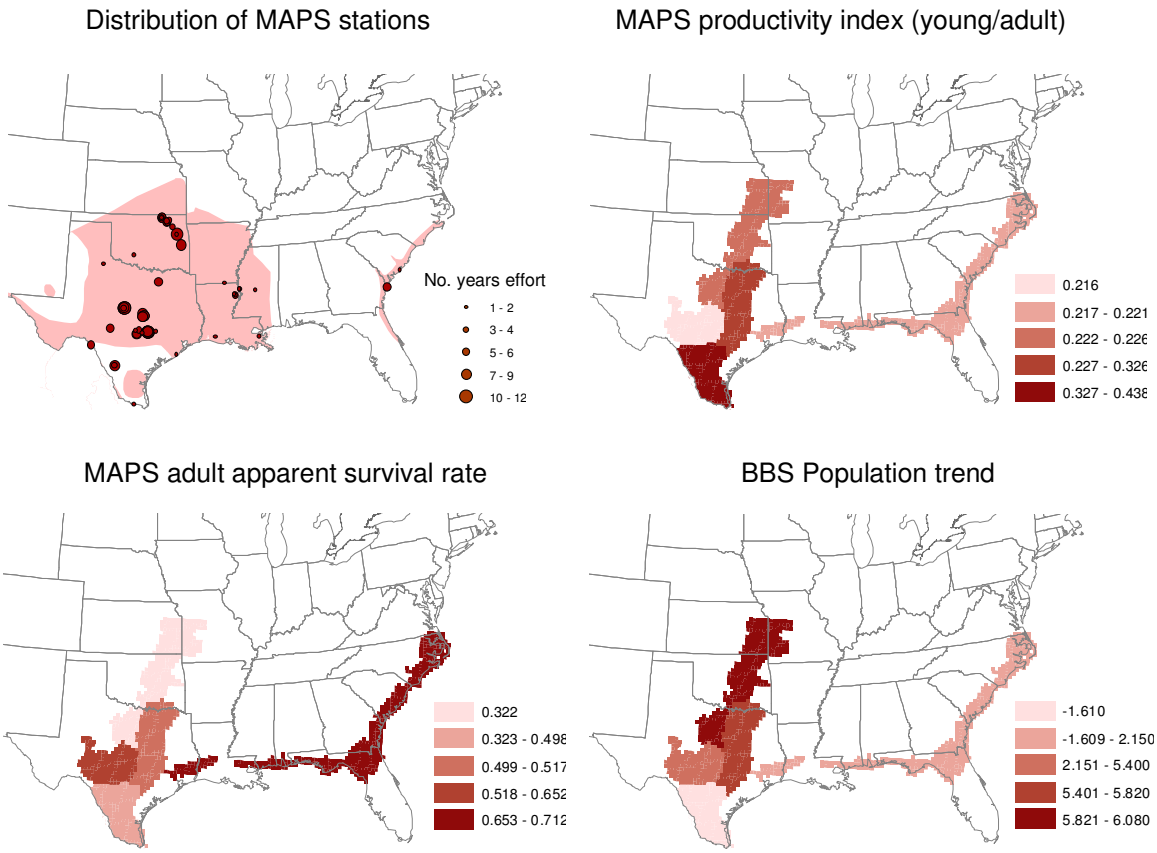

Figure 38. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Bullock's Oriole (*Icterus bullockii*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Bullock's Orioles and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

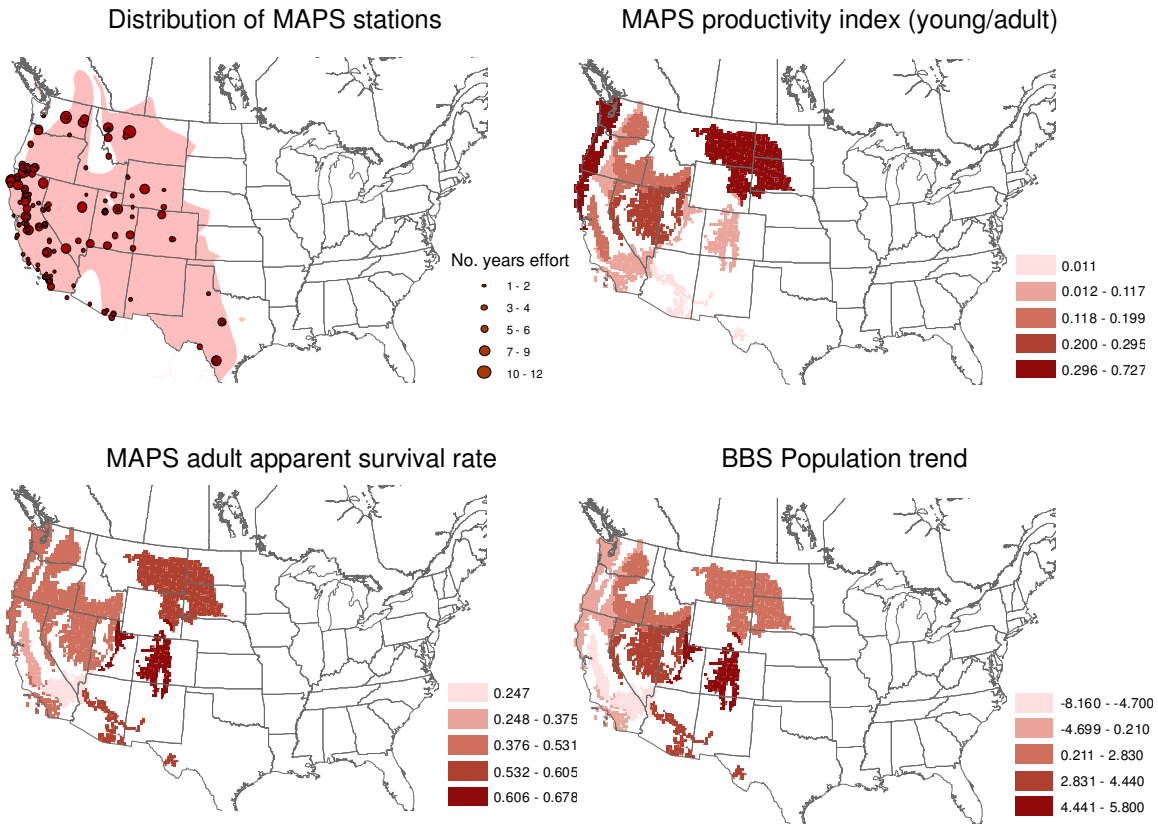

Figure 39. MAPS time-constant (1992-2003) vital rates and BBS population trends for **Baltimore Oriole (*Icterus galbula*)** at the scale of BBS Physiographic Strata. The top left panel shows the summer distribution of Baltimore Orioles and the locations of MAPS stations where they were captured; station symbols are scaled to indicate the number of years of operation. Only strata for which BBS *and* MAPS data were available are presented.

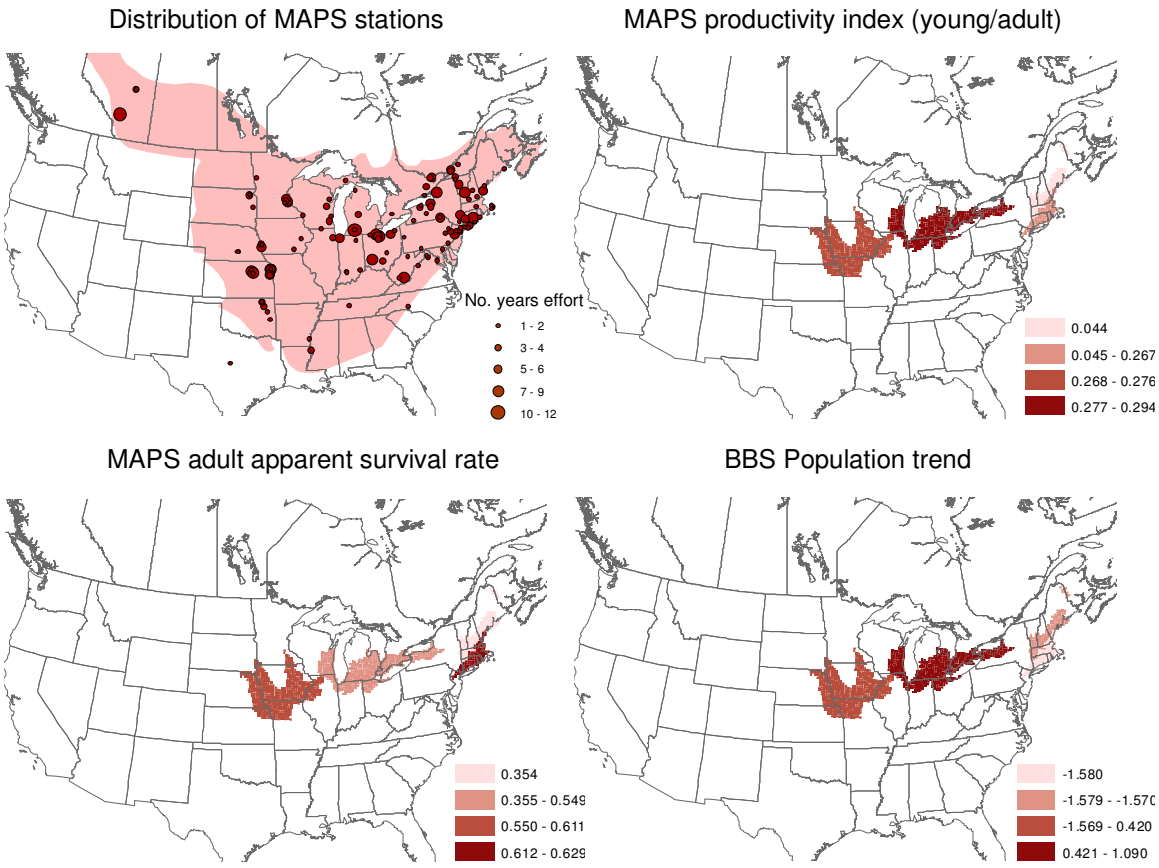

Fig. 40. Spatial variation in the productivity index (young/adult captures) for Wood Thrush across the domain sampled by the MAPS program during four years with relatively consistent effort. Actual productivity index values are represented by red circles, the sizes of which are scaled to their relative magnitudes. Predicted productivity values determined by kriging (see text for detail) are represented by colored contours (yellow = low productivity, brown = high productivity).