

MIGRATIONAL MOVEMENTS AND HABITAT USAGE OF PASSERINES IN THE GREAT LAKES REGION AND SPECIFICALLY THE OTTAWA NATIONAL WILDLIFE REFUGE, OHIO

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INTRODUCTION

This long term study of the Black Swamp Bird Observatory to monitor the population status of neotropical migrants in the Great Lakes region and to better understand the relationship between en-route habitat and their breeding ecology was continued on the Ottawa National Wildlife Refuge complex and various other sites in the region. The southwestern shore of Lake Erie represents a barrier to most passerine migrants. Passerines reluctance to navigate open water results in major concentrations, possibly unparalleled in the Midwest along the lake coast. With continuing habitat loss, both along the Lake Erie coast and inland, this study will assist in monitoring the effects of habitat isolation and degradation. There are only four small segments of beach ridge remaining west of Port Clinton along the Lake Erie shoreline. The massive bird use of these in contrast to the adjacent condominium complexes and marinas signify the importance of this habitat component of the Lake Erie marsh system. While not containing major concentrations such as the beach ridges, a wide range of migration corridor and stopover habitat occurs throughout the region. A wide variety of study sites are necessary to fully examine habitat use, migrational timing, and energetic condition of birds.

The importance of studying avian migration and stopover habitat needs has greatly increased over the past two decades as tropical deforestation and temperate forest fragmentation expands. Little information is known about the "problem" migrants contend with along their migratory routes (Morse 1980), not to mention the transition between spring migration and the breeding period. To offset the energetic costs of migration, birds deposit substantial lipid reserves which may reach 50% body weight among long distance intercontinental migrants (Berthold 1975). As lipid stores are depleted during migration, free living birds are capable of replenishing reserves in a few days at rates approaching 10% body weight per day (e.g. Barlein 1985; Biebach et. al. 1986; Moore & Kerlinger 1987). Whereas these lipid deposits are obviously critical for a successful migration, they may also provide a selective advantage to the migrant with energy reserves remaining (see Sinclair 1983; Ojanen 1984; Krapu et. al. 1985; Krementz & Ankney 1987). Adequate stopover habitat may play an important role in delivering migrating passerines to their breeding grounds with sufficient energy reserves to successfully nest.

STUDY AREAS

Banding sites are centered along the western basin of Lake Erie with additional coverage to the Ohio River and central basin of Lake Erie. The Navarre site is located on the largest remaining beach ridge along the western basin of Lake Erie and holds the most complete native beach ridge vegetative complex. Netting was also conducted on a new beach ridge outside the lake front dike in Navarre during fall migration. This location allows the opportunity to study avian use of a beach ridge from its infancy. The primary Darby NWR site is on one of the three remaining small beach ridges and will provide comparisons with the larger more complete ridge of Navarre. The Darby NWR inland site which is approximately a half a mile from the beach ridge is comprised of dogwood travel lanes and thickets and will be used to compare with the beach ridge and will assist in assessing habitat use. The Ottawa NWR station is located approximately 1 mile off the lake and is composed primarily of a dogwood thicket with a few remnant overstory trees. This site will provide comparison of block scrub-shrub in the vicinity of the lake to the ridges. The Shaker Lake site near Cleveland is several miles from the lake and lies on a major riparian corridor to the lake. Habitats include a brook, a marsh, scrub shrub, and the border of a woods. The Petersburg site in southern Michigan is shrub habitat that is located past the lake effect zone for bird migration. This site will provide comparisons for habitats away from the lake proper and potentially give some indications to how quickly migrants spread out. The Shawnee Lookout site is located between the Ohio River and Great Miami River west of Cincinnati and is the only site of great distance from Lake Erie. All ten nets are placed within the edge of a powerline cut of this hilly region with many deep cool valleys. Shawnee's vegetation is made up of a lot of wild grape, Pawpaw, Hackberry, Walnut, Elm, and Oak species. Pawpaw, Hackberry, and especially wild grape being the dominant species. This can provide information associated with migrational timing, habitat and movement.

METHODS AND MATERIALS

Migrating and resident passerines were sampled on the Navarre, Darby and Ottawa units of the Ottawa National Wildlife Refuge and various sites in the Great Lakes and Ohio River drainage regions.(Figure 1). Sites near Cleveland and Cincinnati, Ohio, and Monroe, Michigan provide comparisons to the three refuge sites that are located at major passerine migration staging areas. Banding and point count efforts should cover a minimum of 75% of the migration period for the study site. Every attempt was made to equalize un-sampled parts at the beginning and end of the migration period. The migration period was considered for short distance migrants as well as neotropicals. Spring migration operation in 2004 began mid-April and continued through early-June. Fall migration banding was July 1 to early November. All sites were monitored through both migration periods.

Netting was conducted from one-half hour before sunrise to at least 11:00 AM on each day of operation weather permitting. Birds were captured utilizing 2.6 x 12 meter mist nets. All birds were removed from the net, band and net recorded if previously banded, and placed in a mesh bag for holding until processing. During processing each bird was banded with a standard U.S. Fish & Wildlife Service leg band, measured by closed wing chord, body mass recorded, and visually

inspected for subcutaneous fat deposits using a 6-point ordinal scale (Helms & Drury 1960). Birds were sexed and aged by the use of plumage characteristics (Pyle et. al. 1997) and guidelines of the Bird Banding Manual and Woods Manual (Woods 1969). Weather data was compiled from hourly readings of Toledo Edison's Davis Besse Nuclear Power Station.

Point counts were conducted during both spring and fall migration. Counts were conducted at points spaced a minimum of 100 meters throughout the banding stations. Counts were conducted for five minutes in which all birds seen or heard were recorded. Counts were run after net set up each morning permitted by weather and avian abundance. Point counts were canceled on extremely high wind or high bird activity days.

RESULTS AND DISCUSSION

SPRING

Spring migration was monitored, weather permitting, daily in the Navarre Unit and when personnel were available at the Darby, Ottawa, Shaker Lakes, Petersburg, Creek Bend, and Shawnee Lookout sites in 2004. April weather patterns resulted in fair waves of birds while the month of May saw very good wave development. From our research, expected large neotropical waves arrive in three general movements. The first wave dominated by male White-throated Sparrow, Hermit Thrush, male Myrtle Warbler, and male Ruby-crowned Kinglet occurs around 25 April. In 2004, this wave materialized 19, 28 April and 1 May. The second wave, known as the big wave, occurs 7-13 May and is represented by the greatest species diversity of the spring and is dominated by female White-throated Sparrow, Swainson's Thrush, female Myrtle Warbler, female Ruby-crowned Kinglet, and male Magnolia Warbler. The second pulse of this wave coming five to seven days after, usually has the largest volume and contains the same species dominants. This wave occurred 6-11 May with the follow up 17-21 May in 2004. The third wave normally comes around Memorial Day weekend and is dominated by female Magnolia Warbler, American Redstart, Mourning Warbler, vireos, and flycatchers. In 2004, the third wave appeared 26 May.

Navarre Banding Station, Ottawa County, Ohio (413-0830)

In spring 2004, the Navarre banding station was operated on 50 days for 6,655.3 net hours. Including hummingbirds, 8,970 new birds were banded and a total of 10,274 birds handled (Table 1). Capture rate (154.4 birds/100 net hours) increased 12% from 2003 (138.3 birds/100 net hours). Ninety-eight species plus one hybrid warbler were banded (Table 2) in Navarre during spring 2004. The most unusual species were the stations first Green Heron and additional surprises such as Brewster's Warbler, Yellow Palm Warbler, Prairie Warbler, Marsh Wren, Clay-colored Sparrow, and Yellow-throated Warbler. The top ten species banded were Magnolia Warbler (879); Myrtle Warbler (719); White-throated Sparrow (489); Gray Catbird (438); Traill's Flycatcher (402); Yellow Warbler (389); Common Yellowthroat (382); Swamp Sparrow (341); American Redstart (291); and Wilson's Warbler (280).

Point counts were initiated in 1995 as a part of the data collection at the Navarre site. These counts are of higher quality than listing, but less quality than the banding data. Counts provide the best data for larger birds not sampled by mist nets. Point counts were conducted on 45 days during spring 2004. One hundred and forty-seven species with 25,500 individuals were recorded (Table 3). Northern Cardinal, Red-winged Blackbird, Brown-headed Cowbird, Tree Swallow, and Song Sparrow were observed each count day. The most abundant species recorded was Blue Jay (5,305) followed by, Red-winged Blackbird (4,360), Tree Swallow (1,682), Canada Goose (1,305), and European Starling (775).

Darby NWR Banding Station, Ottawa County, Ohio (412-0825)

This was the thirteenth year for the Darby study site. This small beach ridge will allow for comparisons with Navarre and give some indication to the relative value to extremely small habitat islands. The Darby banding station was operated 13 days for a total of 780 net hours. Three hundred and twenty five new birds were banded with a total of 325 birds handled (Table 4). A total of 56 species were banded (Table 5). The top ten species banded were Gray Catbird (32); Magnolia Warbler (31); White-throated Sparrow (23); Common Grackle (19); Ovenbird (15); American Robin (14); Yellow Warbler (11); Western Palm Warbler (11); Red-winged Blackbird (9); House Wren (9); and Swainson's Thrush (9). Darby's capture rate was 41.7 birds/100 net hours in 2004.

Ottawa NWR Banding Station, Ottawa County, Ohio (413-0831)

A new site was initiated on the main unit of Ottawa NWR in 1999. It will permit assessment of a dogwood habitat block during migration and compare to the beach ridges. Two hundred and seventy-five new birds were banded and a total of 294 birds were handled (Table 8) of 47 species (Table 7) on eight field days. The top ten species banded were Yellow Warbler (47); Gray Catbird (29); Magnolia Warbler (15); Red-winged Blackbird (14); Traill's Flycatcher (14); Northern Waterthrush (12); Common Yellowthroat (12); American Goldfinch (10); Wilson's Warbler (10); and Common Grackle (10). Ottawa's capture rate was 61.1 birds per 100 net hours. The most unusual capture was a Solitary Sandpiper.

Point counts were conducted on 3 days during spring 2004. Forty-seven species with 522 individuals were recorded (Table 8). The most abundant species recorded was Red-winged Blackbird (133) followed by Yellow Warbler (46), Common Grackle (44), American Robin (39), and American Goldfinch (26).

Creek Bend Banding Station, Sandusky County, Ohio (412-0832)

This site will permit some comparison to the Lake Erie coastal sites as a riverine travel lane. Banding operations were conducted on five days with 175 new birds banded in 350 net hours (50 birds/100 net hours) (Table 9). Thirty-one species (Table 10) were banded with the top nine species banded being Gray Catbird (24); White-throated Sparrow (20); Indigo Bunting (14); American Goldfinch (13); Yellow Warbler (11); Swamp Sparrow (9); Common Yellowthroat (9); Ovenbird (8); and Lincoln

Sparrow (7).

Petersburg Banding Station, Monroe County, Michigan (415-0833)

This site is located west of Lake Erie and north of Toledo and will permit some comparison to the Lake Erie sites as birds migrate around Lake Erie and disperse through the landscape. Banding operations were conducted on sixteen days with 269 new birds banded in 1,532 net hours (17.6 birds/100 net hours) (Table 11). Fifty species (Table 12) were banded with the top ten species banded being Slate-colored Junco (33); American Goldfinch (27); Gray Catbird (25); American Robin (23); Myrtle Warbler (15); Western Palm Warbler (15); Northern Cardinal (14); House Wren (9); White-throated Sparrow (7); Chipping Sparrow (7); and Ruby-crowned Kinglet (7).

Point counts were conducted on 16 days during spring 2004. Thirty-two species with 579 individuals were recorded (Table 13). American Robin was observed each count day. The most abundant species recorded was American Robin (82) followed by, Northern Cardinal (72), Red-winged Blackbird (57), Common Grackle (57), Mourning Dove (44), and Blue Jay (26).

Shaker Lakes Banding Station, Cuyahoga County, Ohio (412-0813)

This site is located east of Cleveland at the Nature Center of Shaker Lakes and 2004 was the third year of the banding operation. This site will permit some comparison to the western Lake Erie sites as birds migrate along Lake Erie and disperse through the landscape. Banding operations were standardized to Monday, Wednesday, and Friday and were conducted on twenty days with 292 new birds banded in 728 net hours (40.1 birds/100 net hours). A total of 368 birds were handled (50.6 birds/100 net hours) during spring migration (Table 14). Fifty-four species (Table 15) were banded with the top ten species banded being American Goldfinch (40); Ruby-crowned Kinglet (39); White-throated Sparrow (25); Gray Catbird (21); Magnolia Warbler (16); American Redstart (14); Canada Warbler (11); Song Sparrow (10); American Robin (9); and Western Palm Warbler (8).

Point counts were conducted on 20 days during spring 2004. Fifty-seven species with 914 individuals were recorded (Table 16). The most abundant species recorded was Rock Pigeon (172) followed by Canada Goose (72), American Goldfinch (71), Red-winged Blackbird (55), and American Robin (54).

FALL

Fall migration starts in July for many species and some breeding neotropicals such as the yellow warbler are practically gone from the study area by mid-August. Fall temperatures appeared similar to 2003. Temperature tended to be slightly above in August and early-October. Fall bird migration is dominated by different stimuli than in spring. Weather appears less important and food availability appears to be a key factor.

Navarre Banding Station, Ottawa County, Ohio (413-0830)

The Navarre main station was operated 66 days for 6,370.5 net hours. Three thousand two hundred and six birds were banded with a total of 4,024 birds handled (Table 17). This was the 12th fall season in which an extensive netting effort had been conducted on a daily basis. The capture rate for 2004 63.2 birds/100 net hours. A total of 85 species were banded during fall 2004 at the main Navarre station (Table 18). The top ten species banded were Swainson's Thrush (350); White-throated Sparrow (270); Gray Catbird (248); Golden-crowned Kinglet (217); Ruby-crowned Kinglet (204); Hermit Thrush (172); American Robin (133); Gray-cheeked Thrush (125); Blackpoll Warbler (124); and Common Yellowthroat (124).

Fall point counts were run on 55 days during 2004. A total of, 48,668 individuals of 110 species were recorded (Table 19). The European Starling and Northern Cardinal were observed on all days of the counts. The most abundant species were Red-winged Blackbird (34,672); Common Grackle (3,761); Canada Goose (1,274); European Starling (1,235); and American Robin (770).

For the 12th year, additional nets were run on a newly formed beach ridge just outside the lake front dike near the main study site. This ridge has one band of 30-60 feet tall Cottonwoods about 50 feet wide and 250 yards long. The ridge presents the opportunity to document avian usage as the habitat matures. Five nets were run on 60 days for 1,457 net hours (Table 20). The capture rate for fall 2004 was 116.1 birds/100 net hours. One thousand and six hundred and ninety-two birds of seventy-six species were banded on the new beach ridge (Table 21). The top ten species banded were Gray Catbird (204); Ruby-crowned Kinglet (172); Myrtle Warbler (151); Blackpoll Warbler (139); Golden-crowned Kinglet (111); Swainson's Thrush (89); Cape May Warbler (75); Common Yellowthroat (72); White-throated Sparrow (56); and Warbling Vireo (54).

Ottawa NWR Banding Station, Ottawa County, Ohio (413-0831)

Forty-seven new birds were banded (39.2 birds /100 net hours were handled (Table 22) at the Ottawa site. Seventeen species (Table 23) were banded on two field days. The top five species banded were Gray Catbird (10); Swainson's Thrush (8); Magnolia Warbler (7); Ovenbird (3); and American Robin (3).

Petersburg Banding Station, Monroe County, Michigan (415-0833)

Banding operations were conducted on 8 days with 160 new birds banded in 833 net hours (19.2 birds/100 net hours) (Table 24). Thirty-six species (Table 25) were banded with the top ten species banded being Gray Catbird (31); Magnolia Warbler (19); Northern Cardinal (12); American Robin (9); Cedar Waxwing (9); Tennessee Warbler (8); Ovenbird (7); American Redstart (6); Swainson's Thrush (6); and Common Grackle (5).

Point counts were conducted on 14 days during fall 2004. Thirty-one species with 1,100 individuals were recorded (Table 26). Blue Jay and American Robin was observed each count day. The most abundant species recorded was Blue Jay (368) followed by American Robin (278), European Starling

(96), Common Grackle (62), and Cedar Waxwing (58).

Shaker Lakes banding Station, Cuyahoga County, Ohio (412-0813)

Banding operations were standardized to Monday, Wednesday, and Friday and were conducted on twenty-seven days with 581 new birds banded in 810 net hours (71.7 birds/100 net hours). A total of 685 birds were handled (84.6 birds/100 net hours) during spring migration (Table 27). Fifty-four species (Table 28) were banded with the top ten species banded being American Goldfinch (80); White-throated Sparrow (71); Gray Catbird (65); Magnolia Warbler (52); Song Sparrow (34); American Redstart (25); Swainson's Thrush (25); Myrtle Warbler (23); Swamp Sparrow (14); and Wilson's Warbler (13).

Point counts were conducted on 24 days during fall 2004. Fifty-four species with 1,350 individuals were recorded (Table 29). American Goldfinch was observed each count day. The most abundant species recorded was Chimney Swift (657), followed American Goldfinch (104); Red-winged Blackbird (89); American Robin (60); and Gray Catbird (42).

SUMMARY BANDINGS

Total combined bandings for passerine migration 2004 for the Black Swamp Bird Observatory is shown in parentheses in Table 30. Totals before parentheses are for the National Wildlife Refuge Complex. The top ten species banded on Ottawa NWR complex were Magnolia Warbler (1,072); Myrtle Warbler (963); Gray Catbird (961); White-throated Sparrow (842); Swainson's Thrush (698); Common Yellowthroat (597); Ruby-crowned Kinglet (573); Yellow Warbler (496); Traill's Flycatcher (427); and Blackpoll Warbler (388). Inclusive totals of all sites were topped by Magnolia Warbler (1,168); Gray Catbird (1,127); Myrtle Warbler (1,002); White-throated Sparrow (965); Swainson's Thrush (739); Ruby-crowned Kinglet (635); Common Yellowthroat (619); Yellow Warbler (519); Traill's Flycatcher (430); and American Redstart (412). A combined total of 121 species and two hybrids of 15,993 individuals (79.5 birds/100 net hrs) were banded. Totals for each study site and for each season are shown in Table 31. Species greater than 50 individuals sampled had age ratios generally similar to 2003 and above the long-term average (Table 32).

RETURNS AND RECOVERIES

A long term study of this type has an added benefit to develop return rates and survival rates over time. One assumption that has not been verified is that passerines always return to their breeding grounds to nest. There are substantial signs for this but more research is needed to confirm the rate of this phenomenon. During 2004, 260 birds of 23 species were captured as returning birds at the Navarre sites (Table 33). This total includes 19 Yellow Warblers with the oldest being banded in 2001, 48 Gray Catbirds, 50 Common Yellowthroats, 27 Red-winged Blackbird, and 15 Baltimore Orioles the oldest coming from 1997. The long term study at Navarre has resulted in state longevity records for the Yellow Warbler, Prothonotary Warbler, Warbling Vireo, Eastern Wood Pewee, Brown Creeper, Northern Waterthrush, Ovenbird, Great-crested Flycatcher, Cedar Waxwing, and Hermit

Thrush. The Yellow Warbler record surpasses the species record as reported by the Bird Banding Laboratory. Continued analysis in this area will hopefully shed some light on turnover rate and site fidelity in some species. An additional 14 birds of four species were return captures at Shawnee Lookout in 2004 (Table 40). Shaker Lakes had 34 returns of 12 species (Table 34) and Ottawa NWR had 18 returns of seven species (Table 35). Several foreign captures were made of study birds and are reported in Table 36.

ENERGETIC CONDITION

The relationship of energetic condition during migration to breeding success is unknown in passerines. There are many factors that could affect the amount of fat a bird may carry at any given time. With this in mind, we are looking at factors that may affect lipid deposition over the next several years. Yearly trends will also be followed. It will be several years before those trends, if any, may be tied to a birds productivity. For 2004, 35 species (Table 37) had adequate sample sizes in both 2003 and 2004 to look at the changes in average fat deposits during spring migration. None of the 35 species had significantly higher ($p < .05$) lipid reserves in 2004. Nine species had higher average in 2004 but showed no significance. Seven species showed significantly higher fat in 2003. While Fat levels in nineteen additional species appeared to be higher in 2003.

Of fifteen species with adequate sample sizes of spring fat and fall age ratios, five appeared to show a similar trend in fat between 2003 and 2004 and the percent change in age ratios for these species between the two years. This relationship will be monitored for potential usefulness in assessing species productivity.

In 2004, fall fat composition had a tendency to be higher in 13 of 18 species with three species showing significance ($p < .05$). The gray catbird demonstrated significantly higher fat levels in 2003 (Table 38).

ENVIRONMENTAL EDUCATION

A secondary goal of this study is to impact the general public on avian migration, research, habitat management, and ecosystems. Project personnel entertained 22 groups at Navarre and 3 at Darby totaling 600 people ranging from elementary to adults for on-site outdoor education. In addition, seven presentations were made to 350 people on avian ecology and migration. As a part of International Migratory Bird Day events, banding demonstrations were done on the refuge for some 4,500 people.

MANAGEMENT RECOMMENDATIONS

Adequate stopover habitat is a necessity if migrating birds are to successfully reach breeding and wintering home ranges each year. While the Lake Erie marsh region may contain extremely important breeding habitats for some species it is of much greater importance in meeting migration stopover needs. The combination of quality marshland, scrub-shrub upland and swamps, and wooded beach ridges provide the basic needs of food, water, and shelter. Wetlands managed for year around

ecosystem values form the base for this habitat complex. The invertebrate populations required by the massive bird movement is born from these wetlands and shelters in the scrub and on beach ridges. This scrub-shrub and beach ridge habitat provides the substrate for shelter from the elements and protection from predators needed by this diverse group of migrant birds as well as their needed food source. A dominant plant species making up the shrub habitat is gray dogwood which not only provide vast surface area for invertebrates but is an important source of berries for fall migrating birds. Any management scheme at this latitude needs to recognize the over-riding importance of the region to stopover habitat. With the exception of the gulf coast, no other region of eastern North America can demonstrate concentrations of avian migrants such as recorded along Lake Erie.

Management needs to ensure protection of the remaining beach ridges and to provide for healthy wetlands and adequate shrub habitat. It is not within reality for management to provide forest needs for deep woods breeders that once occurred in the Great Black Swamp. Wetland and moist soil habitats need to be managed to ensure water inundation during critical spring months to provide the substrate required for abundant invertebrate production. A well planned rotation of units must be incorporated for summer and fall management to provide the needs of the vast faunal array of the region. This includes deep water marsh, shallow water marsh and moist soil areas to provide the variety of habitat types. Shrub and grassland habitat need to consider migration as well as breeding needs in management guidelines. Management scenarios need to include migration needs of food and cover as well as protection during breeding season. Dike systems should be designed to incorporate scrub borders to provide migrational travel lanes to mimic the limited beach ridges and to augment passerine breeding of shrub management units. Research has not been conducted to determine to what extent dike nesting success may affect overall regional avian production. This needs to be assessed to fully utilize this habitat use. In theory, dikes should be looked as potential breeder spillover from more productive shrub habitat blocks. Scrub-shrub habitats need to be maintained to provide adequate surface area for invertebrates, cover for migrant and breeders, and to encourage fruit production for fall migration. This will require periodic rejuvenation of units on a rotational basis.

Wise management of wetlands, shrub, grasslands, and riparian woodlands will not only benefit passerines on a year around basis, but will also enhance other avian groups, mammals, reptiles, amphibians, and native plant associations.

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Table 1. Daily banding totals for Navarre, spring 2004.

Date	Net Hour	Banded	Banded/ 100 net hr	Returns	Recaptures	Total birds*	Total bird/ 100 net hr
409	10.00	3	30.00	2	0	5	50.00
415	126.00	46	36.51	16	1	66	52.38
416	126.00	82	65.08	6	2	92	73.02
417	126.00	109	86.51	1	5	116	92.06
418	126.00	92	73.02	3	9	105	83.33
419	40.00	64	160.00	2	2	69	172.50
420	92.75	21	22.64	2	6	30	32.35
421	88.20	81	91.84	2	4	87	98.64
422	99.75	29	29.07	3	11	44	44.11
423	94.50	21	22.22	3	6	35	27.04
426	126.00	74	58.73	1	9	84	66.67
427	110.25	83	75.28	0	8	94	85.26
428	126.00	147	116.67	2	20	170	134.92
429	141.75	215	151.68	7	9	231	162.96
430	131.25	312	237.71	2	9	323	246.10
501	183.75	359	195.37	4	21	384	208.98
503	136.50	115	84.25	1	36	152	111.36
504	110.25	59	53.52	5	23	90	81.63
505	147.00	227	154.42	2	16	247	168.03
506	168.00	413	245.83	4	22	440	261.91
507	183.75	219	119.18	10	27	257	139.86
508	197.75	256	129.46	8	38	303	153.22
509	157.50	316	200.64	19	33	369	234.29
510	152.25	425	279.15	4	14	444	291.63
511	168.00	514	305.95	14	31	560	333.33
512	159.25	346	217.27	9	43	398	249.92
513	155.75	285	182.97	9	30	325	208.67
514	168.00	314	186.91	1	18	333	198.21
515	147.00	129	87.76	8	47	185	125.85
516	147.00	136	92.52	4	64	205	139.46
517	141.75	268	189.07	7	37	312	220.11
518	183.75	533	290.07	2	23	558	303.67
519	136.50	129	94.51	2	34	167	122.34
520	157.50	396	251.43	4	31	432	274.29
521	178.50	641	359.10	2	28	671	375.91
522	162.75	353	216.90	4	38	395	242.70
523	140.07	199	142.07	7	37	243	173.49
524	136.50	211	154.58	3	34	248	181.69
525	141.75	128	90.30	5	32	166	117.11
526	152.25	157	101.12	3	31	192	126.11
527	120.75	56	46.28	3	17	76	62.94
528	105.00	37	35.24	2	13	52	49.52
529	110.25	38	34.47	3	23	64	58.05
530	110.25	43	39.00	3	18	64	58.05
531	110.25	54	48.98	1	12	67	60.77
601	115.50	67	58.01	3	12	82	71.00
602	143.50	84	58.54	6	19	109	75.96
603	110.25	17	15.42	1	13	31	28.12
604	115.50	33	28.57	5	10	48	41.56
605	136.50	34	24.91	4	15	54	39.56
TOTAL	6655.27	8970	134.78	224	1041	10274	154.37

* Total birds include Brown-headed cowbirds and European starlings released unbanded.

Table 2. Spring banding totals, Navarre, 2004.

Species	Banded	Species	Banded	Species	Banded
Green Heron	1	Swamp Sparrow	341	Yellow-throated Warbler	1
Sora	3	Fox Sparrow	1	Black-th.-Green Warbler	36
American Woodcock	1	Eastern Towhee	1	Pine Warbler	2
Sharp-shinned Hawk	7	Northern Cardinal	31	Western Palm Warbler	252
Yellow-billed Cuckoo	6	Rose-breasted Grosbeak	12	Yellow Palm Warbler	1
Black-billed Cuckoo	4	Indigo Bunting	128	Prairie Warbler	3
Hairy Woodpecker	1	Scarlet Tanager	6	Ovenbird	156
Downy Woodpecker	2	Summer Tanager	3	Northern Waterthrush	142
Yellow-bellied Sapsucker	5	Tree Swallow	16	Louisiana Waterthrush	2
Red-bellied Woodpecker	1	Cedar Waxwing	13	Kentucky Warbler	2
Yellow-shafted Flicker	4	Red-eyed Vireo	222	Connecticut Warbler	11
Ruby-th. Hummingbird	72	Philadelphia Vireo	43	Mourning Warbler	152
Eastern Kingbird	5	Warbling Vireo	21	Common Yellowthroat	382
Great-crested Flycatcher	22	Yellow-throated Vireo	2	Yellow-breasted Chat	8
Olive-sided Flycatcher	2	Blue-headed Vireo	19	Hooded Warbler	12
Eastern Wood Pewee	53	White-eyed Vireo	21	Wilson's Warbler	280
Yellow-bellied Flycatcher	116	Black and White Warbler	104	Canada Warbler	156
Acadian Flycatcher	16	Prothonotary Warbler	8	American Redstart	291
Trail's Flycatcher	402	Worm-eating Warbler	2	Gray Catbird	438
Least Flycatcher	70	Blue-winged Warbler	13	Brown Thrasher	13
Blue Jay	68	Brewster's Warbler	1	Carolina Wren	3
Red-winged Blackbird	170	Golden-winged Warbler	2	House Wren	73
Orchard Oriole	3	Nashville Warbler	223	Winter Wren	10
Baltimore Oriole	37	Orange-crowned Warbler	27	Marsh Wren	1
Rusty Blackbird	1	Tennessee Warbler	64	Brown Creeper	6
Common Grackle	10	Northern Parula	11	Red-breasted Nuthatch	3
American Goldfinch	70	Cape May Warbler	18	Golden-crowned Kinglet	9
White-crowned Sparrow	69	Yellow Warbler	389	Ruby-crowned Kinglet	186
Gambels W-c Sparrow	2	Black-th.-Blue Warbler	38	Blue-gray Gnatcatcher	71
White-throated Sparrow	489	Myrtle Warbler	719	Wood Thrush	30
American Tree Sparrow	1	Magnolia Warbler	879	Veery	86
Chipping Sparrow	2	Cerulean Warbler	2	Gray-cheeked Thrush	48
Clay-colored Sparrow	1	Chestnut-sided Warbler	204	Swainson's Thrush	237
Field Sparrow	2	Bay-breasted Warbler	102	Hermit Thrush	95
Slate-colored Junco	14	Blackpoll Warbler	122	American Robin	18
Song Sparrow	52	Blackburnian Warbler	27	Eastern Bluebird	2
Lincoln Sparrow	133				

Table 3. Number of days observed and totals of species seen on point counts, Navarre spring 2004.

Species	# days	#Observed	Species	# days	#Observed	Species	# days	#Observed
Pied-billed Grebe	35	187	Yellow-shafted Flicker	23	75	Red-eyed Vireo	24	91
Common Loon	1	1	Common Nighthawk	2	2	Philadelphia Vireo	1	1
Herring Gull	40	158	Chimney Swift	27	155	Warbling Vireo	20	38
Ring-billed Gull	26	122	Ruby-th. Hummingbird	7	10	Yellow-throated Vireo	1	1
Bonaparte's Gull	1	1	Eastern Kingbird	19	54	Blue-headed Vireo	3	4
Caspian Tern	6	18	Great-crested Flycatcher	14	40	White-eyed Vireo	6	7
Common Tern	2	3	Olive-sided Flycatcher	2	2	Black & White Warbler	17	40
Dou.-cr. Cormorant	21	141	Eastern Wood Pewee	14	35	Prothonotary Warbler	30	75
Hooded Merganser	1	1	Yellow-bel. Flycatcher	3	3	Blue-winged Warbler	3	3
Mallard	18	38	Acadian Flycatcher	1	1	Nashville Warbler	11	35
Gadwall	3	20	Alder Flycatcher	1	1	Tennessee Warbler	13	45
American Wigeon	1	1	Willow Flycatcher	15	86	Northern Parula	4	8
Green-winged Teal	1	2	Traill's Flycatcher	10	18	Cape May Warbler	1	1
Blue-winged Teal	3	14	Least Flycatcher	14	39	Yellow Warbler	35	655
Wood Duck	33	188	Blue Jay	40	5305	Black-th.-Blue Warbler	6	10
Canada Goose	40	1305	American Crow	2	2	Myrtle Warbler	21	199
Trumpeter Swan	5	10	European Starling	44	775	Magnolia Warbler	17	115
American Bittern	2	4	Bobolink	8	16	Chestnut-sided Warbler	22	49
Least Bittern	2	2	Brown-headed Cowbird	45	415	Bay-breasted Warbler	9	24
Great-blue Heron	42	208	Red-winged Blackbird	45	4360	Blackpoll Warbler	14	74
Great Egret	31	70	Orchard Oriole	8	11	Blackburnian Warbler	4	6
Snowy Egret	2	2	Baltimore Oriole	34	448	Black-th.-Green Warbler	12	23
Green Heron	9	20	Rusty Blackbird	8	61	Western Palm Warbler	12	42
Black-cr. N. Heron	3	3	Common Grackle	43	591	Ovenbird	18	48
Virginia Rail	17	28	Purple Finch	5	23	Northern Waterthrush	21	66
Sora	38	484	House Finch	1	1	Louisiana Waterthrush	1	1
American Coot	5	7	American Goldfinch	39	462	Mourning Warbler	13	19
American Woodcock	1	1	Pine Siskin	1	2	Common Yellowthroat	37	310
Solitary Sandpiper	7	22	White-crowned Sparrow	11	79	Hooded Warbler	2	2
Greater Yellowlegs	3	7	White-throated Sparrow	29	657	Wilson's Warbler	15	52
Lesser Yellowlegs	4	8	Chipping Sparrow	2	2	Canada Warbler	8	28
Dunlin	1	5	Clay-colored Sparrow	2	2	American Redstart	21	90
Killdeer	8	11	Field Sparrow	2	3	Gray Catbird	37	504
Mourning Dove	33	114	Slate-colored Junco	1	5	Brown Thrasher	26	54
Rock Pigeon	2	3	Song Sparrow	45	490	Carolina Wren	42	188
Northern Harrier	3	7	Lincoln Sparrow	5	7	House Wren	39	228
Sharp-shinned Hawk	3	3	Swamp Sparrow	25	84	Black-capped Chickadee	3	4
Red-tailed Hawk	2	3	Eastern Towhee	2	3	Ruby-crowned Kinglet	20	84
Bald Eagle	6	14	Northern Cardinal	44	542	Blue-gray Gnatcatcher	18	99
American Kestrel	2	2	Rose-breasted Grosbeak	17	57	Wood Thrush	18	37
Merlin	1	1	Indigo Bunting	29	327	Veery	14	37
Great-horned Owl	3	3	Scarlet Tanager	7	11	Gray-checked Thrush	1	7
Yellow-bill. Cuckoo	11	27	Summer Tanager	3	3	Swainson's Thrush	16	65
Black-billed Cuckoo	14	30	Purple Martin	20	56	Hermit Thrush	6	9
Belted Kingfisher	3	3	Barn Swallow	25	117	American Robin	40	211
Downy Woodpecker	33	92	Tree Swallow	45	1682	Eastern Bluebird	2	3
Yel.-bel. Sapsucker	3	3	Bank Swallow	9	41	Unk. warbler	28	540
Red-h. Woodpecker	1	1	Rough-winged Swallow	1	1			
Red-b. Woodpecker	4	8	Cedar Waxwing	23	700			

Table 4. Daily banding totals for Darby, spring 2004.

Date	Net Hour	Banded	Banded/ 100 net hr	Returns	Recaptures	Total birds*	Total bird/ 100 net hr
0413	60	12	20.0	0	0	12	20.0
0414	60	7	11.67	0	0	7	11.67
0420	60	8	13.33	0	0	8	13.33
0503	60	64	106.67	0	0	64	106.67
0504	60	17	28.33	0	0	17	28.33
0513	60	63	105.00	0	0	63	105.00
0514	60	67	111.67	0	0	67	111.67
0515	60	10	16.67	0	0	10	16.67
0517	60	1	1.67	0	0	1	1.67
0518	60	13	21.67	0	0	13	21.67
0527	60	10	16.67	0	0	10	16.67
0629	60	20	33.33	0	0	20	33.33
0630	60	33	55.00	0	0	33	55.00
TOTAL	780	325	41.67	0	0	325	41.67

Table 5. Spring banding totals for Darby 2004.

Species	Banded	Species	Banded	Species	Banded
Downy Woodpecker	5	Worm-eating Warbler	1	Wilson's Warbler	5
Trail's Flycatcher	2	Brewster's Warbler	1	Canada Warbler	2
Least Flycatcher	2	Lawrence's Warbler	1	American Redstart	8
European Starling	2	Nashville Warbler	2	Gray Catbird	32
Brown-headed Cowbird	4	Yellow Warbler	11	Brown Thrasher	3
Red-winged Blackbird	9	Black-th.-Blue Warbler	2	Carolina Wren	2
Baltimore Oriole	3	Magnolia Warbler	31	House Wren	9
Common Grackle	19	Chestnut-sided Warbler	2	Brown Creeper	2
Am. Goldfinch	1	Bay-breasted Warbler	1	Black-capped Chickadee	1
White-th. Sparrow	23	Blackpoll Warbler	2	Golden-crowned Kinglet	4
Slate-colored Junco	1	Black-th. Green Warbler	2	Ruby-crowned Kinglet	6
Song Sparrow	2	Western Palm Warbler	11	Blue-gray Gnatcatcher	1
Lincoln Sparrow	1	Ovenbird	15	Wood Thrush	4
Fox Sparrow	1	Northern Waterthrush	3	Veery	8
Northern Cardinal	6	Connecticut Warbler	1	Gray-cheeked Thrush	5
Indigo Bunting	7	Mourning Warbler	8	Swainson's Thrush	9
Philadelphia Vireo	2	Common Yellowthroat	5	Hermit Thrush	6
White-eyed Vireo	1	Yellow-breasted Chat	1	American Robin	14
Black and White Warbler	5	Hooded Warbler	6		

Table 6 . Daily banding totals for Ottawa NWR, spring 2004.

Date	Net Hour	Banded	Banded/ 100 net hr	Returns	Recaptures	Total bird	Total bird/ 100 net hr
0417	60	11	18.33	0	0	11	18.33
0418	60	19	31.67	0	0	19	31.67
0430	60	36	60.00	0	0	36	60.00
0515	60	76	126.67	13	0	89	148.30
0517	60	43	71.67	0	0	43	71.67
0518	60	49	81.67	0	0	49	81.67
0527	60	14	23.33	0	0	14	23.33
0602	60	27	45.00	5	1	33	55.00
TOTAL	480	275	57.29	18	1	294	61.13

Table 7. Spring banding totals, Ottawa NWR, 2004.

Species	# Banded	Species	# Banded	Species	# Banded
Solitary Sandpiper	1	Swamp Sparrow	2	Mourning Warbler	2
Yellow-billed Cuckoo	1	Northern Cardinal	8	Common Yellowthroat	12
Acadian Flycatcher	1	Indigo Bunting	5	Hooded Warbler	1
Trail's Flycatcher	14	Red-eyed Vireo	2	Wilson Warbler	10
Blue Jay	3	Philadelphia Vireo	1	Canada Warbler	7
Brown-headed Cowbird	4	Cape May Warbler	1	American Redstart	8
Red-winged Blackbird	14	Yellow Warbler	47	Gray Catbird	29
Baltimore Oriole	5	Black-th. Blue Warbler	1	Brown Thrasher	3
Common Grackle	10	Myrtle Warbler	2	House Wren	3
American Goldfinch	10	Magnolia Warbler	15	Ruby-crowned Kinglet	4
White-crowned Sparrow	5	Chestnut-sid Warbler	1	Blue-gray Gnatcatcher	1
White-throated Sparrow	4	Bay-breasted Warbler	2	Wood Thrush	1
American Tree Sparrow	1	Blackpoll Warbler	1	Swainson's Thrush	5
Slate-colored Junco	1	Western Palm Warbler	1	Hermit Thrush	5
Song Sparrow	4	Ovenbird	2	American Robin	2
Lincoln Sparrow	1	Northern Waterthrush	12		

Table 8. Point count days conducted and species totals, spring season, Ottawa NWR, 2004.

Species	# days	# birds	Species	# days	# birds	Species	# days	# birds
Herring Gull	1	6	Blue Jay	2	3	Warbling Vireo	2	13
Ring-billed Gull	2	3	European Starling	1	3	Tennessee Warbler	1	3
Canada Goose	1	20	Brown-head. Cowbird	1	5	Yellow Warbler	2	46
Great Blue Heron	1	1	Red-winged Blackbird	3	133	Mrytle Warbler	1	1
Great Egret	1	2	Baltimore Oriole	1	1	Magnolia Warbler	1	1
Green Heron	1	2	Common Grackle	3	44	No. Waterthrush	1	4
American Woodcock	1	1	American Goldfinch	3	26	Com. Yellowthroat	2	15
Killdeer	2	2	White-th. Sparrow	2	6	Gray Catbird	2	16
Mourning Dove	2	4	Song Sparrow	3	12	Brown Thrasher	2	5
American Kestrel	1	1	Northern Cardinal	3	17	Carolina Wren	1	1
Downy Woodpecker	1	1	Indigo Bunting	1	3	Ruby-cr. Kinglet	1	6
Yellow-sh. Flicker	1	1	Purple Martin	1	2	Blue-gr. Gnatcatcher	1	1
Chimney Swift	2	11	Barn Swallow	1	2	Wood Thrush	2	6
Great-cr. Flycatcher	1	1	Tree Swallow	3	9	Hermit Thrush	1	1
Eastern Phoebe	1	1	Cedar Waxwing	1	18	American Robin	3	39
Willow Flycatcher	2	9	Red-eyed Vireo	2	10	Unk. warbler	1	4

Table 9. Daily banding totals for Creek bend, spring 2004.

Date	Net Hour	Banded	Banded/ 100 net hr	Returns	Recaptures	Total birds*	Total bird/ 100 net hr
0505	70	43	61.43	0	0	43	61.43
0506	70	25	35.71	0	0	25	35.71
0510	70	70	100.00	0	0	70	100.00
0513	70	32	45.71	0	0	32	45.71
0514	70	5	7.14	0	0	5	7.14
TOTAL	350	175	50.00	0	0	175	50.00

Table 10. Daily banding totals Creek Bend, spring 2004.

Species	Banded	Species	Banded	Species	Banded
Downy Woodpecker	3	Northern Cardinal	1	Common Yellowthroat	9
Least Flycatcher	1	Indigo Bunting	14	Wilson's Warbler	1
Blue Jay	1	Tree Swallow	2	American Redstart	1
Red-winged Blackbird	1	Black and White Warbler	1	Gray Catbird	24
Baltimore Oriole	3	Nashville Warbler	3	House Wren	6
American Goldfinch	13	Yellow Warbler	11	White-breasted Nuthatch	1
White-crowned Sparrow	7	Magnolia Warbler	5	Wood Thrush	6
White-throated Sparrow	20	Western Palm Warbler	5	Swainson's Thrush	1
Song Sparrow	6	Ovenbird	8	American Robin	1
Lincoln Sparrow	7	Northern Waterthrush	2		
Swamp Sparrow	9	Mourning Warbler	2		

Table 11. Daily banding totals for Petersburg, spring 2004.

Date	Net Hour	Banded	Banded/ 100 net hr	Returns	Recaptures	Total birds*	Total bird/ 100 net hr
403	98.00	43	43.88	6	0	49	50.00
406	89.00	16	17.98	1	5	22	24.72
410	88.00	19	21.59	2	4	25	28.41
418	90.00	5	5.56	2	2	9	10.00
422	92.00	14	15.22	5	6	25	27.17
424	95.00	12	12.63	3	5	20	21.05
427	95.00	9	9.47	0	5	14	14.74
504	96.00	38	39.58	1	1	40	41.67
506	99.00	21	21.21	2	5	28	28.28
509	95.00	27	28.42	1	2	30	31.58
515	98.00	18	18.37	3	5	26	26.53
516	89.00	8	8.99	2	5	15	16.85
517	103.00	15	14.56	1	7	23	22.33
526	101.00	13	12.87	2	6	21	20.79
528	101.00	5	4.95	1	5	11	10.89
529	103.00	6	5.83	1	5	12	11.65
TOTAL	1532.00	269	17.56	33	68	370	24.15

Table 12. Daily banding totals Petersburg, spring, 2004.

Species	Banded	Species	Banded	Species	Banded
Hairy Woodpecker	1	Indigo Bunting	4	Wilson's Warbler	1
Red-bellied Woodpecker	1	Red-eyed Vireo	1	House Sparrow	1
Yellow-sh. Flicker	1	Warbling Vireo	1	Gray Catbird	25
Acadian Flycatcher	1	Blue-winged Warbler	2	Brown Thrasher	1
Trails' Flycatcher	2	Tennessee Warbler	2	House Wren	9
Least Flycatcher	1	Yellow Warbler	3	White-breasted Nuthatch	1
Blue Jay	4	Black-th.-blue Warbler	1	Tufted Titmouse	3
Brown-headed Cowbird	2	Myrtle Warbler	15	Black-capped Chickadee	2
Red-winged Blackbird	1	Magnolia Warbler	4	Golden-crowned Kinglet	1
Common Grackle	4	Chestnut-sided Warbler	1	Ruby-crowned Kinglet	7
American Goldfinch	27	Bay-breasted Warbler	1	Blue-gray Gnatcatcher	3
White-throated Sparrow	7	Blackpoll Warbler	1	Wood Thrush	4
Chipping Sparrow	7	Western Palm Warbler	15	Grey-cheeked Thrush	3
Slate-colored Junco	33	Ovenbird	2	Swainson's Thrush	3
Song Sparrow	6	Northern Waterthrush	6	Hermit Thrush	5
Swamp Sparrow	1	Mourning Warbler	2	American Robin	23
Northern Cardinal	14	Common Yellowthroat	3		

Table 13. Point count days conducted and species totals, spring season, Petersburg, 2004.

Species	# days	# birds	Species	# days	# birds	Species	# days	# birds
Mallard	4	11	Red-winged Blackbird	11	57	Yellow Warbler	7	13
Wood Duck	1	1	Common Grackle	15	57	Myrtle Warbler	1	1
Canada Goose	5	12	American Goldfinch	6	11	Gray Catbird	6	20
Ring-necked Pheasant	6	8	White-throat. Sparrow	1	1	Brown Thrasher	1	1
Mourning Dove	14	44	Chipping Sparrow	6	9	House Wren	7	8
Cooper's Hawk	3	3	Field Sparrow	10	16	Tufted Titmouse	9	10
Yellow-sh. Flicker	2	2	Slate-colored Junco	2	4	Black-cap Chickadee	13	25
Blue Jay	12	26	Song Sparrow	8	11	Wood Thrush	2	3
American Crow	8	9	Eastern Towhee	12	13	American Robin	16	82
European Starling	4	16	Northern Cardinal	15	72	Eastern Bluebird	1	1
Br.-headed Cowbird	6	22	Warbling Vireo	5	10			

Table 14. Daily banding totals for Shaker Lakes, spring 2004.

Date	Net Hour	Banded	Banded/ 100 net hr	Returns	Recaptures	Total birds*	Total bird/ 100 net hr
419	36.00	20	55.56	0	0	20	55.56
421	32.00	17	53.13	0	0	17	53.13
423	33.00	16	48.48	0	0	16	48.48
426	33.00	13	39.39	0	0	13	39.39
428	34.00	8	23.53	3	2	13	38.23
430	34.50	9	26.09	3	1	13	37.68
503	36.00	20	55.56	3	2	25	69.44
505	37.00	30	81.08	1	4	35	94.59
507	33.50	20	59.70	2	2	24	71.64
510	38.00	20	52.63	2	1	23	60.53
512	35.5	15	42.25	2	1	18	50.70
514	35.5	19	53.52	2	4	25	70.42
517	37.5	6	16.00	1	3	10	26.46
519	42.00	12	28.57	3	4	19	45.24
521	40.50	19	46.91	3	6	28	69.14
524	38.50	13	33.77	1	3	17	44.16
528	39.50	11	27.85	1	4	16	40.51
531	36.00	5	13.89	0	3	8	22.22
602	36.00	8	22.22	1	3	12	33.33
604	20.00	11	27.50	1	4	16	80.00
TOTAL	728.00	292	40.11	29	47	368	50.55

Table 15. Daily banding totals Shaker Lakes, spring 2004.

Species	Banded	Species	Banded	Species	Banded
American Woodcock	1	Field Sparrow	1	Northern Waterthrush	4
Solitary Sandpiper	2	Song Sparrow	10	Mourning Warbler	1
Mourning Dove	4	Lincoln Sparrow	2	Common Yellowthroat	5
Hairy Woodpecker	1	Swamp Sparrow	5	Wilson's Warbler	5
Yellow-shafted Flicker	1	Northern Cardinal	4	Canada Warbler	11
Eastern Phoebe	1	Indigo Bunting	1	American Redstart	14
Olive-sided Flycatcher	1	Cedar Waxwing	1	Gray Catbird	21
Yellow-bellied Flycatcher	1	Warbling Vireo	2	Carolina Wren	2
Trail's Flycatcher	1	White-eyed Vireo	1	House Wren	3
Least Flycatcher	1	Blue-winged Warbler	2	Winter Wren	1
Brown-headed Cowbird	3	Nashville Warbler	3	Marsh Wren	1
Red-winged Blackbird	2	Yellow Warbler	7	Black-capped Chickadee	1
Baltimore Oriole	1	Black-th. Blue Warbler	2	Ruby-cr. Kinglet	39
Common Grackle	3	Myrtle Warbler	1	Blue-gray Gnatcatcher	3
American Goldfinch	40	Magnolia Warbler	16	Wood Thrush	3
White-crowned Sparrow	1	Chestnut-sided Warbler	4	Swainson's Thrush	6
White-throated Sparrow	25	Western Palm Warbler	8	Hermit Thrush	2
Chipping Sparrow	1	Yellow Palm Warbler	1	American Robin	9

Table 16. Point count days conducted and species totals, spring season, Shaker Lakes, 2004.

Species	# days	# birds	Species	# days	# birds	Species	# days	# birds
Herring Gull	5	11	European Starling	1	1	Magnolia Warbler	2	4
Mallard	13	34	Brown-head. Cowbird	12	17	Chestnut-sid. Warbler	3	3
Wood Duck	9	21	Red-winged Blackbird	20	55	Blk-th-Green Warbler	2	2
Canada Goose	15	72	Baltimore Oriole	13	28	Western Palm Warbler	3	3
Great Blue Heron	5	7	Common Grackle	6	8	Common Yellowthroat	1	1
Turkey Vulture	1	1	American Goldfinch	18	71	American Redstart	2	3
Mourning Dove	5	7	Wh.-crowned Sparrow	1	1	House Sparrow	1	1
Rock Pigeon	15	172	Wh.-throated Sparrow	6	11	Gray Catbird	12	29
Yellow-billed Cuckoo	1	1	Song Sparrow	19	42	Carolina Wren	11	12
Hairy Woodpecker	2	2	Northern Cardinal	17	25	House Wren	1	1
Downy Woodpecker	5	7	Rose-br. Grosbeak	1	1	White-br. Nuthatch	6	6
Red-bell Woodpecker	13	16	Indigo Bunting	1	1	Tufted Titmouse	13	19
Yellow-shaft. Flicker	13	15	Barn Swallow	1	1	Black-cap. Chickadee	15	16
Chimney Swift	4	13	N. Rough-wing Swal.	3	4	Ruby-crowned Kinglet	7	8
Great-cr. Flycatcher	8	12	Cedar Waxwing	1	5	Blue-gray Gnatcatcher	6	12
Eastern Phoebe	5	5	Warbling Vireo	13	20	Wood Thrush	3	3
Eastern Wood Pewee	2	2	Nashville Warbler	1	1	American Robin	17	54
Blue Jay	5	8	Yellow Warbler	6	7	Unk. gull	8	13
American Crow	1	1	Myrtle Warbler	4	5	Unk. duck	2	2

Table 17. Daily banding totals for Navarre, fall 2004.

Date	Net Hour	Banded	Banded/100 net hr	Returns	Recaptures	Total birds*	Total bird/ 100 net hr
708	99.75	80	80.20	1	6	87	87.22
807	47.25	50	105.82	2	1	53	112.17
822	110.25	59	53.52	0	5	64	58.05
823	105.00	25	23.81	1	2	28	26.67
824	105.00	17	16.19	0	4	21	20.00
825	89.25	28	31.37	1	2	31	34.73
826	92.75	23	24.80	2	2	27	29.11
827	99.75	18	18.05	0	3	21	21.05
828	99.75	27	27.07	0	2	29	29.07
829	35.07	2	5.70	0	1	3	8.55
830	105.00	16	15.24	0	4	20	19.05
831	110.25	30	27.21	1	4	35	31.75
901	99.75	20	20.05	0	6	26	26.07
902	92.75	11	11.86	0	2	13	14.02
903	105.00	18	17.14	0	10	28	26.67
904	89.25	8	8.96	0	3	11	12.33
905	84.00	10	11.91	0	10	20	23.81
906	92.75	13	14.02	0	5	18	19.41
907	84.00	10	11.91	0	6	16	19.05
908	89.25	15	16.81	0	3	18	20.17
909	94.50	23	24.34	1	3	27	28.57
910	105.00	49	46.67	0	10	59	56.19
911	98.07	36	36.71	0	9	45	45.89
912	94.50	36	38.10	0	8	44	46.56
913	105.00	46	43.81	1	12	59	56.19
914	99.75	57	57.14	0	9	66	66.17
915	94.50	37	39.15	0	9	46	48.68
916	94.50	31	32.80	0	4	35	37.04
917	84.00	18	21.43	0	5	23	27.38
918	94.50	51	53.97	0	12	63	66.67
919	90.93	46	50.59	0	16	62	68.18
920	89.25	43	48.18	0	5	48	53.78
921	94.50	74	78.31	1	7	82	86.77
922	126.00	81	64.29	0	7	88	69.84
923	103.25	76	73.61	0	9	85	82.32
924	110.25	66	59.86	1	11	78	70.75
925	105.00	61	58.10	0	9	70	66.67
926	105.00	52	49.52	0	16	68	64.76
927	94.50	49	51.85	1	9	59	62.34
928	99.75	49	49.12	0	19	68	68.17
929	99.75	59	59.15	0	25	84	84.21
930	106.75	65	60.89	0	14	80	74.94
1001	115.50	65	56.28	0	26	91	78.79
1002	90.93	17	18.70	0	9	26	28.59
1003	98.07	60	61.18	0	13	73	74.44
1004	94.50	32	33.86	0	3	35	37.04
1005	94.50	39	41.27	0	8	47	49.74
1006	94.50	52	55.03	0	13	65	68.78
1007	92.75	35	37.74	0	17	52	56.07
1008	105.00	34	32.38	0	14	48	45.71
1009	105.00	45	42.86	0	16	61	58.10
1010	84.00	56	66.67	0	11	67	79.76
1011	105.00	119	113.33	0	15	134	127.62
1012	110.25	121	109.75	0	14	149	135.15
1013	105.00	76	72.38	0	34	110	104.76
1014	78.75	99	125.71	1	21	121	153.65
1015	35.07	22	62.73	0	7	29	82.69
1016	80.85	56	69.26	0	31	87	107.61
1017	84.00	75	89.29	1	43	119	141.67
1018	94.50	79	83.60	1	35	115	121.69
1019	89.25	48	53.78	0	19	67	75.07
1020	99.75	86	86.22	0	29	115	115.29
1021	126.00	144	114.29	0	34	178	141.27
1022	131.25	120	91.43	0	25	145	110.48
1024	120.75	86	71.22	0	31	117	96.89
1103	110.25	55	49.89	1	8	65	58.96
TOTAL	6370.49	3206	50.33	17	785	4024	63.17

Table 18. Fall banding totals, Navarre 2004.

Species	Banded	Species	Banded	Species	Banded
American Woodcock	2	Song Sparrow	41	Western Palm Warbler	3
Sharp-shinned Hawk	1	Lincoln Sparrow	7	Ovenbird	52
Yellow-billed Cuckoo	2	Swamp Sparrow	26	Northern Waterthrush	17
Downy Woodpecker	10	Fox Sparrow	13	Connecticut Warbler	5
Yellow-bellied Sapsucker	3	Eastern Towhee	1	Mourning Warbler	10
Red-bellied Woodpecker	2	Northern Cardinal	49	Common Yellowthroat	124
Yellow-shafted Flicker	4	Rose-breasted Grosbeak	7	Yellow-breasted Chat	1
Ruby-th Hummingbird	2	Indigo Bunting	5	Wilson's Warbler	5
Eastern Kingbird	1	Cedar Waxwing	15	Canada Warbler	4
Great-crested Flycatcher	5	Red-eyed Vireo	41	American Redstart	45
Eastern Phoebe	11	Philadelphia Vireo	5	Gray Catbird	248
Olive-sided Flycatcher	1	Warbling Vireo	2	Brown Thrasher	5
Eastern Wood Pewee	8	Blue-headed Vireo	11	Carolina Wren	12
Yellow-bellied Flycatcher	30	Black and Wh. Warbler	13	House Wren	34
Acadian Flycatcher	2	Prothonotary Warbler	6	Winter Wren	60
Traill's Flycatcher	8	Blue-winged Warbler	2	Marsh Wren	2
Blue Jay	7	Nashville Warbler	23	Brown Creeper	65
Red-winged Blackbird	8	Orange-crown. Warbler	1	Red-breasted Nuthatch	16
Orchard Oriole	1	Tennessee Warbler	38	Black-capped Chickadee	5
Baltimore Oriole	19	Cape May Warbler	16	Golden-crowned Kinglet	217
Rusty Blackbird	14	Yellow Warbler	36	Ruby-crowned Kinglet	204
Common Grackle	44	Black-th-Blue Warbler	28	Wood Thrush	11
Purple Finch	2	Myrtle Warbler	91	Veery	21
American Goldfinch	12	Magnolia Warbler	103	Gray-cheeked Thrush	125
White-crowned Sparrow	14	Chestnut-sided Warbler	7	Bicknell's Thrush	1
White-throated Sparrow	270	Bay-breasted Warbler	6	Swainson's Thrush	350
Chipping Sparrow	1	Blackpoll Warbler	124	Hermit Thrush	172
Field Sparrow	1	Black-th-Green Warbler	7	American Robin	133
Slate-colored Junco	50				

Table 19. Number of days observed and totals of species seen on point counts, Navarre fall 2004.

Species	# days	#Observed	Species	# days	#Observed	Species	# days	#Observed
Common Loon	2	2	Yel.-bel. Sapsuck.	3	4	Cedar Waxwing	33	350
Herring Gull	29	283	Red-bellied Wood.	10	12	Red-eyed Vireo	5	6
Ring-billed Gull	42	467	Yellow-sh. Flicker	38	126	Warbling Vireo	1	1
Bonaparte's Gull	17	276	Chimney Swift	27	127	Black & Wh. Warb.	1	1
Common Tern	1	20	Ruby-th. Humm.	1	1	Blue-winged Warb.	1	1
Caspian Tern	9	21	Eastern Kingbird	4	5	Nashville Warbler	7	9
Forster's Tern	2	11	Great-cr. Flycatcher	1	1	Tennessee Warbler	2	2
D-c. Cormorant	23	422	Eastern Phoebe	2	2	Cape May Warbler	5	7
Mallard	30	328	Olive-sid. Flycatcher	2	2	Bl.-th.-Blue Warb.	3	3
Am. Black Duck	5	9	E. Wood Pewee	2	2	Myrtle Warbler	19	116
Gadwall	7	27	Horned Lark	3	13	Magnolia Warbler	16	21
American Wigeon	12	232	Blue Jay	43	256	Bay-br. Warbler	2	2
Green-winged Teal	3	9	American Crow	3	12	Blackpoll Warb.	25	64
Blue-winged Teal	2	6	European Starling	55	1235	Com. Yellowthroat	18	30
Northern Shoveler	3	6	Brown-hd. Cowbird	18	148	Wilson's Warbler	1	1
Northern Pintail	5	27	Red-wing Blackbird	54	34672	Canada Warbler	1	1
Wood Duck	8	16	Baltimore Oriole	11	33	American Redstart	7	12
Canada Goose	46	1274	Rusty Blackbird	18	506	Gray Catbird	42	297
Great- blue Heron	18	24	Common Grackle	49	3761	Brown Thrasher	17	24
Great Egret	5	8	Purple Finch	20	119	Carolina Wren	44	112
Green Heron	5	5	House Finch	4	20	House Wren	12	14
Black.-cr. N. Heron	1	1	American Goldfinch	36	110	Winter Wren	19	35
Sora	3	3	Pine Siskin	11	33	Marsh Wren	1	1
American Coot	2	4	White-cr. Sparrow	3	3	Brown Creeper	8	10
American Woodcock	1	1	White-th. Sparrow	28	552	Tufted Titmouse	1	1
Common Snipe	2	7	Slate-colored Junco	7	14	Red-br. Nuthatch	22	50
Lesser Yellowlegs	1	4	Song Sparrow	21	41	Black.-ca. Chickadee	8	10
Greater Yellowlegs	3	3	Swamp Sparrow	2	3	Golden-cr. Kinglet	17	104
Killdeer	10	25	Fox Sparrow	5	6	Ruby-cr. Kinglet	20	57
Mourning Dove	15	34	Eastern Towhee	5	8	Wood Thrush	1	1
Rock Pigeon	1	1	Northern Cardinal	55	278	Veery	11	18
Sharp-shinned Hawk	3	4	Rose-br. Grosbeak	5	7	Gray-cheek. Thrush	19	46
Cooper's Hawk	3	3	Indigo Bunting	1	1	Swainson's Thrush	34	223
Red-tailed Hawk	2	2	Purple Martin	6	29	Hermit Thrush	5	8
American Kestrel	2	2	Barn Swallow	7	19	American Robin	54	770
Bald Eagle	9	17	Tree Swallow	12	59	Unk. warbler	41	289
Belted Kingfisher	2	2	Bank Swallow	1	1	Unk. flycatcher	2	2
Downy Woodpecker	49	162						

Table 20. Daily banding totals for Navarre Beach, fall 2004.

Date	Net Hour	Banded	Banded/100 nh	Returns	Recaptures	Total birds*	Totalbird/100nh
822	32.08	44	137.16	1	2	47	146.51
823	25.00	47	188.00	0	7	54	216.00
824	25.00	14	56.00	0	0	14	56.00
825	23.75	5	21.05	0	2	7	29.47
826	25.00	16	64.00	0	1	17	68.00
827	25.00	7	28.00	0	0	7	28.00
828	28.75	8	27.83	0	2	10	34.78
829	10.00	6	60.00	0	2	8	80.00
830	27.50	2	7.27	0	0	2	7.27
831	27.50	18	65.46	1	2	21	76.36
901	26.25	19	72.38	0	5	24	91.43
902	22.08	10	45.29	0	2	12	54.35
903	27.50	12	43.64	0	1	13	47.27
904	23.75	12	50.53	1	4	17	71.58
905	22.50	9	40.00	0	7	16	71.11
906	26.25	14	53.33	0	1	15	57.14
907	22.50	2	8.89	0	1	3	13.33
909	25.00	11	44.00	0	1	12	48.00
910	27.50	46	167.27	0	1	47	170.91
911	25.00	35	140.00	2	6	43	172.00
912	25.00	45	180.00	0	7	52	208.00
913	27.50	36	130.91	0	2	38	138.18
914	25.00	28	112.00	0	4	32	128.00
915	24.17	27	111.71	1	6	34	140.67
916	23.75	18	75.79	0	4	22	92.63
919	24.17	8	33.10	0	1	9	37.24
920	23.75	23	96.84	1	4	28	117.90
921	23.75	34	143.16	0	5	39	164.21
922	31.25	49	156.80	0	5	54	172.80
923	26.25	30	114.29	1	4	35	133.33
924	28.75	30	104.35	0	5	35	121.74
925	26.25	33	125.71	1	2	36	137.14
926	25.00	9	36.00	0	2	11	44.00
927	26.25	32	121.91	0	2	34	129.52
928	11.25	3	26.67	0	2	5	44.44
929	15.75	12	76.19	0	1	13	82.54
930	26.25	26	99.05	0	5	31	118.10
1001	28.75	17	59.13	0	4	21	73.04
1002	24.15	23	95.24	0	2	25	103.52
1003	27.50	58	210.91	0	1	59	214.55
1004	25.00	44	176.00	0	12	56	224.00
1005	25.00	8	32.00	0	2	10	40.00
1006	25.00	24	96.00	0	4	28	112.00
1007	24.53	44	179.37	0	5	49	199.76
1008	26.25	27	102.86	0	3	30	114.29
1009	27.92	72	257.88	0	6	78	279.37
1010	22.50	4	17.78	0	1	5	22.22
1011	26.25	52	198.10	0	0	52	198.10
1012	26.25	56	213.33	0	0	56	213.33
1013	26.25	29	110.48	0	3	32	121.91
1014	28.75	60	208.70	1	11	72	250.44
1015	9.15	21	229.51	0	2	23	251.37
1016	17.50	41	234.29	0	4	45	257.14
1017	18.38	50	272.04	0	7	57	310.12
1018	25.00	24	96.00	0	9	33	132.00
1020	25.00	45	180.00	1	13	59	236.00
1021	31.65	69	218.01	0	6	75	236.97
1022	29.15	92	315.61	0	8	100	343.05
1024	25.42	52	204.56	0	11	63	247.84
TOTAL	1457.35	1692	116.10	11	222	1925	132.09

Table 21. Fall banding totals, Navarre Beach 2004.

Species	Banded	Species	Banded	Species	Banded
American Woodcock	3	Northern Cardinal	11	Ovenbird	8
Mourning Dove	4	Indigo Bunting	5	Northern Waterthrush	10
Yellow-billed Cuckoo	1	Cedar Waxwing	6	Connecticut Warbler	2
Downy Woodpecker	9	Red-eyed Vireo	19	Mourning Warbler	3
Yellow-bellied Sapsucker	1	Philadelphia Vireo	9	Common Yellowthroat	72
Yellow-shafted Flicker	3	Warbling Vireo	54	Wilson's Warbler	3
Eastern Kingbird	1	Yellow-throated Vireo	1	Canada Warbler	1
Eastern Phoebe	20	Blue-headed Vireo	9	American Redstart	13
Eastern Wood Pewee	4	White-eyed Vireo	1	Gray Catbird	204
Yellow-bellied Flycatcher	4	Black and White Warbler	1	Brown Thrasher	5
Trail's Flycatcher	1	Prothonotary Warbler	1	Carolina Wren	9
Least Flycatcher	7	Nashville Warbler	33	House Wren	13
Blue Jay	2	Orange-crowned Warbler	7	Winter Wren	19
Red-winged Blackbird	17	Tennessee Warbler	42	Marsh Wren	1
Baltimore Oriole	3	Cape May Warbler	75	Brown Creeper	9
Rusty Blackbird	1	Yellow Warbler	13	Red-breasted Nuthatch	18
Common Grackle	17	Black-th.-Blue Warbler	6	Black-capped Chickadee	1
American Goldfinch	12	Myrtle Warbler	151	Golden-crowned Kinglet	111
White-crowned Sparrow	6	Magnolia Warbler	37	Ruby-crowned Kinglet	172
White-throated Sparrow	56	Chestnut-sided Warbler	2	Wood Thrush	2
Field Sparrow	2	Bay-breasted Warbler	4	Veery	7
Slate-colored Junco	28	Blackpoll Warbler	139	Gray-cheeked Thrush	10
Song Sparrow	11	Blackburnian Warbler	2	Swainson's Thrush	89
Lincoln Sparrow	1	Black-th.-Green Warbler	2	Hermit Thrush	40
Swamp Sparrow	10	Western Palm Warbler	10	American Robin	5
Fox Sparrow	1				

Table 22 . Daily banding totals for Ottawa NWR, fall 2004.

Date	Net Hour	Banded	Banded/ 100 net hr	Returns	Recaptures	Total birds*	Total bird/ 100 net hr
0927	60	15	25.00	2	0	17	28.33
0925	60	32	53.33	0	0	32	53.33
TOTAL	120	47	39.17	2	0	49	40.83

Table 23. Fall banding totals for Ottawa NWR site, 2004.

Species	Banded	Species	Banded	Species	Banded
American Goldfinch	2	Bay-breasted Warbler	1	House Wren	2
Swamp Sparrow	1	Ovenbird	3	Ruby-crowned Kinglet	1
Northern Cardinal	1	Common Yellowthroat	2	Gray-cheeked Thrush	2
Nashville Warbler	1	American Redstart	1	Swainson's Thrush	8
Cape May Warbler	1	Northern Mockingbird	1	American Robin	3
Magnolia Warbler	7	Gray Catbird	10		

Table 24. Daily banding totals for Petersburg, fall 2004.

Date	Net Hour	Banded	Banded/ 100 net hr	Returns	Recaptures	Total birds*	Total bird/ 100 net hr
821	76.50	15	19.61	0	1	16	20.92
822	130.40	10	7.67	0	2	12	9.20
904	124.60	42	33.71	1	2	45	36.12
905	76.50	10	13.07	0	3	13	16.99
906	127.50	21	16.47	0	6	27	21.18
912	123.20	39	31.66	1	3	43	34.90
1010	72.00	4	5.56	0	1	5	6.94
1024	102.67	19	18.51	1	2	22	21.43
TOTAL	833.37	160	19.20	3	20	183	21.96

Table 25. Daily banding totals Petersburg, fall 2004.

Species	Banded	Species	Banded	Species	Banded
Sharp-shinned Hawk	1	Tennessee Warbler	8	American Redstart	6
Downy Woodpecker	1	Black-th.-Blue Warbler	1	Gray Catbird	31
Eastern Wood Pewee	1	Magnolia Warbler	19	Winter Wren	3
Blue Jay	2	Chestnut-sided Warbler	1	White-breasted Nuthatch	3
Common Grackle	5	Bay-breasted Warbler	1	Tufted Titmouse	4
Slate-colored Junco	1	Blackpoll Warbler	3	Black-capped Chickadee	3
Eastern Towhee	1	Blackburnian Warbler	2	Golden-crowned Kinglet	2
Northern Cardinal	12	Ovenbird	7	Ruby-crowned Kinglet	4
Cedar Waxwing	9	Northern Waterthrush	1	Gray-cheeked Thrush	2
Black and White Warbler	3	Mourning Warbler	1	Swainson's Thrush	6
Blue-winged Warbler	2	Wilson's Warbler	1	Hermit Thrush	2
Nashville Warbler	1	Canada Warbler	1	American Robin	9

Table 26. Point count days conducted and species totals, fall season, Petersburg, 2004.

Species	# days	# birds	Species	# days	# birds	Species	# days	# birds
Mallard	1	1	American Crow	8	20	Cedar Waxwing	4	58
Canada Goose	2	7	European Starling	5	96	Tennessee Warbler	1	2
Ring-necked Pheasant	2	2	Brown-head. Cowbird	4	22	Magnolia Warbler	1	1
Killdeer	2	2	Red-winged Blackbird	1	4	Blackpoll Warbler	1	1
Mourning Dove	9	22	Common Grackle	5	62	Gray Catbird	10	42
Cooper's Hawk	2	2	House Finch	1	1	White-br. Nuthatch	4	7
Downy Woodpecker	2	2	American Goldfinch	13	47	Tufted Titmouse	1	1
Red-bel. Woodpecker	1	1	White-th. Sparrow	1	2	Black-cap Chickadee	4	4
Yellow-sh. Flicker	2	2	Song Sparrow	2	2	American Robin	14	278
Great.-cr. Flycatcher	1	1	Northern Cardinal	12	36	Eastern Bluebird	2	4
Blue Jay	14	368						

Table 27. Daily banding totals for Shaker Lakes, fall 2004.

Date	Net hour	Banded	Banded/ 100 net hr	Returns Recaptures	Recaptures	Total birds*	Total bird/ 100 net hr
823	32.5	21	64.62	0	0	21	64.62
825	37.5	22	58.67	3	1	26	69.33
827	35.5	11	30.99	0	5	16	45.07
830	34.5	3	8.70	0	5	8	23.19
901	32.5	5	15.39	0	5	10	30.77
903	35.0	12	34.29	0	3	15	42.86
906	35.5	38	107.04	0	5	43	121.13
908	15.5	12	77.42	0	2	14	90.32
910	31.0	22	70.97	0	6	28	90.32
913	24.5	24	97.96	0	3	27	110.20
915	36.0	57	158.33	0	1	58	161.11
917	8.0	11	137.50	0	1	12	150.00
920	32.5	28	86.15	0	6	34	104.62
922	30.0	19	63.33	0	4	23	76.67
924	31.0	26	83.87	1	6	33	106.45
927	27.5	19	69.09	0	4	23	83.64
929	28.0	16	57.14	0	4	20	71.43
1001	27.0	10	37.04	0	2	12	44.44
1008	31.0	12	38.71	1	6	19	61.29
1011	34.0	48	141.18	0	1	49	144.12
1013	30.5	22	72.13	0	5	27	88.53
1015	21.5	12	55.81	0	1	13	60.47
1018	27.5	24	87.27	0	5	29	105.45
1020	28.0	16	57.14	0	7	23	82.14
1022	36.0	17	47.22	0	2	19	52.78
1025	32.5	24	73.85	1	4	29	89.23
1101	35.0	50	142.86	1	3	54	154.29
Total	810.0	581	71.73	7	97	685	84.57

Table 28. Daily banding totals Shaker Lakes, fall 2004.

Species	Banded	Species	Banded	Species	Banded
Downy Woodpecker	3	Black and White Warbler	3	Canada Warbler	1
Red-bellied Woodpecker	1	Blue-winged Warbler	1	American Redstart	25
Eastern Wood Pewee	4	Nashville Warbler	8	Gray Catbird	65
Yellow-bellied Flycatcher	2	Orange-crowned Warbler	2	Carolina Wren	4
Least Flycatcher	4	Yellow Warbler	2	House Wren	8
House Finch	3	Black-thr.-Blue Warbler	2	Winter Wren	10
American Goldfinch	80	Myrtle Warbler	23	White-breasted Nuthatch	2
White-crowned Sparrow	5	Magnolia Warbler	52	Red-breasted Nuthatch	2
White-throated Sparrow	71	Chestnut-sided Warbler	6	Tufted Titmouse	5
Song Sparrow	34	Bay-breasted Warbler	3	Black-capped Chickadee	6
Lincoln Sparrow	2	Blackpoll Warbler	3	Golden-crowned Kinglet	3
Swamp Sparrow	14	Blackburnian Warbler	3	Ruby-crowned Kinglet	12
Fox Sparrow	1	Ovenbird	5	Wood Thrush	2
Northern Cardinal	9	Northern Waterthrush	12	Veery	1
Rose-breasted Grosbeak	4	Mourning Warbler	2	Grey-cheeked Thrush	8
Cedar Waxwing	5	Common Yellowthroat	3	Swainson's Thrush	25
Red-eyed Vireo	1	Hooded Warbler	1	Hermit Thrush	5
Blue-headed Vireo	7	Wilson's Warbler	13	American Robin	3

Table 29. Point count days conducted and species totals, fall season, Shaker Lakes, 2004.

Species	# days	# birds	Species	# days	# birds	Species	# days	# birds
Herring Gull	1	1	Eastern Phoebe	2	2	Cape May Warbler	1	1
Mallard	10	14	Olive-sided Flycatcher	1	1	Myrtle Warbler	3	17
Wood Duck	5	11	Eastern Wood Pewee	3	3	Magnolia Warbler	3	3
Canada Goose	3	6	Blue Jay	7	11	Northern Waterthrush	1	1
Great Blue Heron	2	5	American Crow	1	1	Common Yellowthroat	1	1
Green Heron	2	2	European Starling	4	23	American Redstart	1	1
Mourning Dove	9	32	Red-winged Blackbird	8	89	Gray Catbird	14	42
Rock Pigeon	5	27	Common Grackle	8	31	Carolina Wren	7	8
Cooper's Hawk	2	2	American Goldfinch	24	104	White-br. Nuthatch	9	11
Osprey	1	1	Wh-crowned Sparrow	1	1	Red-br. Nuthatch	2	2
Belted Kingfisher	6	7	Wh-throated Sparrow	8	14	Tufted Titmouse	3	3
Hairy Woodpecker	12	12	Slate-colored Junco	2	2	Black-cap. Chickadee	9	13
Downy Woodpecker	15	21	Song Sparrow	16	20	Ruby-crowned Kinglet	2	4
Red-bell. Woodpecker	16	19	Swamp Sparrow	2	3	Swainson's Thrush	3	5
Yellow-shaft. Flicker	6	8	Northern Cardinal	6	7	American Robin	16	60
Common Nighthawk	1	1	Rose-br. Grosbeak	3	4	Unk. gull	7	15
Chimney Swift	13	657	Cedar Waxwing	1	1	Unk. warbler	5	14
R-th Hummingbird	3	3	Warbling Vireo	1	1	Unk. woodpecker	2	2

Table 30. Total bandings Black Swamp Bird Observatory, passerine migration , 2004.

Species	Banded	Species	Banded	Species	Banded
Green Heron	1	Song Sparrow	110 (166)	Pine Warbler	2
American Woodcock	6 (7)	Lincoln Sparrow	143 (154)	Western Palm Warbler	277 (305)
Sora	3	Swamp Sparrow	380 (409)	Yellow Palm Warbler	1 (2)
Solitary Sandpiper	1 (3)	Fox Sparrow	16 (17)	Prairie Warbler	3
Mourning Dove	4 (8)	Eastern Towhee	2 (3)	Ovenbird	236 (258)
Sharp-shinned Hawk	8 (9)	Northern Cardinal	106 (146)	Northern Waterthrush	184 (209)
Yellow-billed Cuckoo	10	Rose-breasted Grosbeak	19 (23)	Louisiana Waterthrush	2
Black-billed Cuckoo	4	Indigo Bunting	150 (169)	Kentucky Warbler	2
Hairy Woodpecker	1 (3)	Scarlet Tanager	6	Connecticut Warbler	19
Downy Woodpecker	26 (33)	Summer Tanager	3	Mourning Warbler	175 (183)
Yellow-bellied Sapsucker	9	Tree Swallow	16 (18)	(7) Common Yellowthroat	597 (619)
Red-bellied Woodpecker	3 (5)	Cedar Waxwing	34 (49)	Yellow-breasted Chat	10
Yellow-shafted Flicker	11 (13)	Red-eyed Vireo	284 (286)	Hooded Warbler	19 (20)
Eastern Kingbird	7	Philadelphia Vireo	60	Wilson's Warbler	303 (324)
Great-crested Flycatcher	27	Warbling Vireo	77 (80)	Canada Warbler	170 (183)
Eastern Phoebe	31 (32)	Yell-throated Vireo	3	(10) American Redstart	366 (412)
Olive-sided Flycatcher	3 (4)	Blue-headed Vireo	39 (46)	House Sparrow	0 (1)
Eastern Wood Pewee	65 (70)	White-eyed Vireo	23 (24)	Northern Mockingbird	1
Yellow-bellied Flycatcher	160 (163)	Black and White Warbler	123 (131)	(2) Gray Catbird	961 (1127)
Acadian Flycatcher	19	Prothonotary Warbler	15	Brown Thrasher	29 (30)
(9) Traill's Flycatcher	427 (430)	Worm-eating Warbler	3	Carolina Wren	26 (32)
Least Flycatcher	79 (86)	Blue-winged Warbler	15 (22)	House Wren	134 (162)
Blue Jay	80 (87)	Brewster's Warbler	2	Winter Wren	89 (103)
European Starling	2	Lawrence's Warbler	1	Marsh Wren	4 (5)
Brown-headed Cowbird	8 (11)	Gold-winged Warbler	2	Brown Creeper	82
Red-winged Blackbird	218 (222)	Nashville Warbler	282 (297)	White-breasted Nuthatch	0 (7)
Orchard Oriole	4	Orange-crowned Warbler	35 (37)	Red-breasted Nuthatch	37 (39)
Baltimore Oriole	67 (71)	Tennessee Warbler	144 (154)	Tufted Titmouse	0 (12)
Rusty Blackbird	16	Northern Parula	11	Black-capped Chickadee	7 (19)
Common Grackle	100 (112)	Cape May Warbler	111	Golden-crowned Kinglet	341 (347)
Purple Finch	2	(8) Yellow Warbler	496 (519)	(6) Ruby-crowned Kinglet	573 (635)
House Finch	0 (3)	Black-th.-Blue Warbler	75 (81)	Blue-gray Gnatcatcher	73 (79)
American Goldfinch	107 (267)	(3) Myrtle Warbler	963 (1002)	Wood Thrush	48 (63)
Wh-crowned Sparrow	94 (107)	(1) Magnolia Warbler	1072(1168)	Veery	122 (123)
Gambel's W-c Sparrow	2	Cerulean Warbler	2	Gray-cheeked Thrush	190 (203)
(4) White-throated Sparrow	842 (965)	Chestnut-sided Warbler	216 (228)	Bicknell's Thrush	1
American Tree Sparrow	2	Bay-breasted Warbler	116 (121)	(5) Swainson's Thrush	698 (739)
Chipping Sparrow	3 (11)	Blackpoll Warbler	388 (395)	Hermit Thrush	318 (332)
Clay-colored Sparrow	1	Blackburnian Warbler	29 (34)	American Robin	177 (222)
Field Sparrow	5 (6)	Yellow-throated Warbler	1	Eastern Bluebird	2
Satel-colored Junco	94 (128)	Black-th.-Green Warbler	47	R-th. Hummingbird	74

() numbers in bold are top ten banded species

Table 31. Banding effort totals by area and by season, 2004.

Area	Sample Days	Net Hours	Birds Banded	Birds/ 100 Net Hr	Total Captured	Total/ 100 Net Hr
Navarre	117	14,483.2	13,868	95.8	16,223	112.0
Darby	13	780	325	41.7	325	41.7
Ottawa	10	600	322	53.7	343	57.1
Petersburg	24	2,365.4	429	18.1	553	23.4
Shaker Lakes	48	1,538	873	56.8	1,053	68.5
Creek Bend	5	350	175	50.0	175	50.0
Season	Sample Days	Net Hours	Birds Banded	Birds/ 100 Net Hr	Total Captured	Total/ 100 Net Hr
All Stations						
Spring	51	10,525.3	10,307	97.9	11,807	112.2
Fall	66	9,591.2	5,686	59.3	6,866	71.6
TOTAL	117	20,116.5	15,993	79.5	18,673	92.8
ONWR Stations						
Spring	51	7,915.3	9,570	120.9	10,893	137.6
Fall	66	7,947.8	4,945	62.2	5,998	75.5
TOTAL	117	15,863.1	14,515	91.5	16,891	106.5

Table 32. Fall age ratios of selected species, Navarre 2004.

Species	2004		2003		Percent Change	91-03 Ave. HY/AHY	2004 % Change from avg.
	Sample	HY/AHY	Sample	HY/AHY			
Baltimore Oriole	22	6.33	29	3.83	+65	6.47	-2
Wh-th Sparrow*	326	2.98	435	3.83	-22	4.50	-34
Song Sparrow	52	3.00	103	4.42	-32	2.21	+36
Cedar Waxwing	21	4.25	13	2.25	+89	2.03	+109
Red-eyed Vireo	60	6.50	96	5.40	+20	5.71	+14
Warbling Vireo	56	27.00	71	6.10	+343	8.27	+226
Bl. & Wh. Warbler	14	1.80	21	1.63	+10	2.13	_15
Nashville Warbler	56	1.33	45	3.09	_57	3.21	_59
Tenn. Warbler	80	25.67	98	8.80	+192	7.40	+247
Cape May Warbler	91	1.17	108	1.77	34	1.18	_1
Bl-thr-Blue Warb.	34	3.86	35	1.33	+190	3.91	-1
Myrtle Warbler	242	2.23	331	3.09	_28	2.05	+9
Magnolia Warbler	140	2.68	230	4.11	-35	3.08	-13
Blackpoll Warbler	263	1.55	370	2.21	-30	1.94	-20
Ovenbird	60	6.50	62	14.50	-55	7.62	-15
No. Waterthrush	27	8.00	40	1.22	+556	4.38	+83
Com. Yellowthroat	196	7.52	273	5.83	+29	6.86	+10
American Redstart	58	1.76	152	1.20	+47	2.74	-36
Gray Catbird	452	11.22	395	11.22	NC	9.33	+20
House Wren	46	8.20	83	4.19	+96	6.45	+27
Gray-cheek Thrush	135	3.82	164	1.56	+145	2.05	+86
Swainson's Thrush	439	1.74	487	2.34	-25	1.52	+14
Hermit Thrush	212	5.06	224	6.47	-22	5.73	-12
American Robin	138	3.31	123	3.73	-11	3.45	-4

*Species in bold have samples sizes for both 2003 and 2004 over 50.

Table 33. Banding year of returning birds captured at Navarre study site, 2004.

Species	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	Total
Downy Woodpecker	8	1									9
Yellow-sh Flicker	1										1
Eastern Phoebe	1										1
Blue Jay	4										4
Red-wing. Blackbird	9	8	6	2	1		1				27
Baltimore Oriole	4	8			1		2				15
Common Grackle	1										1
Song Sparrow	6	4		3	1						14
Swamp Sparrow	1										1
Northern Cardinal	12	5	3	1	2						23
Indigo Bunting	3	3	1	1							8
Tree Swallow	2		2								4
Warbling Vireo	1										1
Prothonotary Warb	2	2					1				5
Blue-winged Warbler		1									1
Yellow Warbler	9	7	1	2							19
Com. Yellowthroat	26	22	5	4	1	1					50
Gray Catbird	23	20	2	2		1					48
Brown Thrasher	1		1								2
Carolina Wren	8	5	1								14
Black-cap. Chickadee		1	1								2
House Wren	5	2									7
American Robin	2			1							3
Total	129	89	23	16	6	2	4				260

Table 34. Banding year of returning birds captured at Shaker Lakes study site, 2004.

Species	2003	2002	2001	Total
Eastern Phoebe	1			1
Red-winged Blackbird		1		1
Baltimore Oriole		1	1	2
American Goldfinch	9	1		10
Wh-th Sparrow	1			1
Song Sparrow	3		2	5
Northern Cardinal	2		2	4
Warbling Vireo		1		1
Gray Catbird	2	1	2	5
Carolina Wren		1		1
Tufted Titmouse	2			2
Black-capped Chickadee	1			1
Total	21	6	7	34

Table 35. Banding year of returning birds captured at Ottawa NWR study site, 2004.

Species	2003	2002	2001	2000	Total
Baltimore Oriole	1	1			2
American Goldfinch		1			1
Northern Cardinal			1		1
Yellow Warbler	7	4			11
Common Yellowthroat	1				1
Wood Thrush		1			1
American Robin		1			1
Total	9	8	1		18

Table 36. Foreign recoveries of study banded birds since last progress report.

Species	Band Number	Band Date	Band Location	Recovery Date	Recovery Location*
Yellow-sh. Flicker	1543-00544	04-26-04	Navarre	08-24-04	Ohio 413-0831
Gray Catbird	0951-53232	07-16-02	Navarre	05-23-04	Ohio 413-0830
Gray Catbird	8061-66965	05-21-02	Darby	05-13-04	Ohio 413-0830
Swainson's Thrush	1591-57000	09-14-97	Navarre	09-18-04	Georgia 353-0823
American Robin	0952-45772	10-14-03	Navarre	04-26-04	Ohio 413-0825

*Banding coordinates for study sites: Navarre 413-0830, Darby 413-0825, Sabroske 413-0831, Ottawa NWR 413-0831.

Table 37. Spring fat composition comparisons of selected species for 2003 and 2004, Navarre.

Sign. Higher 2004	Non-sign. Higher 2004	Sign. Higher 2003	Non- sign. Higher 2003
	House Wren	Wilson's Warbler	Bl.-gr. Gnatcatcher
	Golden-cr. Kinglet	Tennessee Warbler	Indigo Bunting
	No. Waterthrush	Yellow Warbler	Traill's Flycatcher
	Hermit Thrush	Magnolia Warbler	Wh.-throated Sparrow
	Swamp Sparrow	Chestnut-sided Warbler	West. Palm Warbler
	Ovenbird	Bay-breasted Warbler	Blackpoll Warbler
	Myrtle Warbler	Veery	American Redstart
	Gray Catbird		Gray-ch. Thrush
	Cape May Warbler		Swainson's Thrush
			Yellow-bellied Flycatcher
			Least Flycatcher
			Canada Warbler
			Common Yellowthroat
			Lincoln Sparrow
			Black & White Warbler
			Nashville Warbler
			Red eyed Vireo
			Mourning Warbler
			Ruby-cr. Kinglet

Table 38. Fall fat composition comparisons of selected species for 2003 and 2004, Navarre.

Sign. Higher 2004	Non-sign. Higher 2004	Sign. Higher 2003	Non- sign. Higher 2003
Ruby-cr. Kinglet	Myrtle Warbler	Gray Catbird	Ovenbird
Swainson's Thrush	Swamp Sparrow		Common Yellowthroat
Wh.-throated Sparrow	Black & White Warbler		Cape May Warbler
	Gray-ch. Thrush		Red-eyed Vireo
	Blackpoll Warbler		
	House Wren		
	Golden-cr. Kinglet		
	Magnolia Warbler		
	American Redstart		
	Hermit Thrush		

Figure 1. Migration field sites, 2008.

