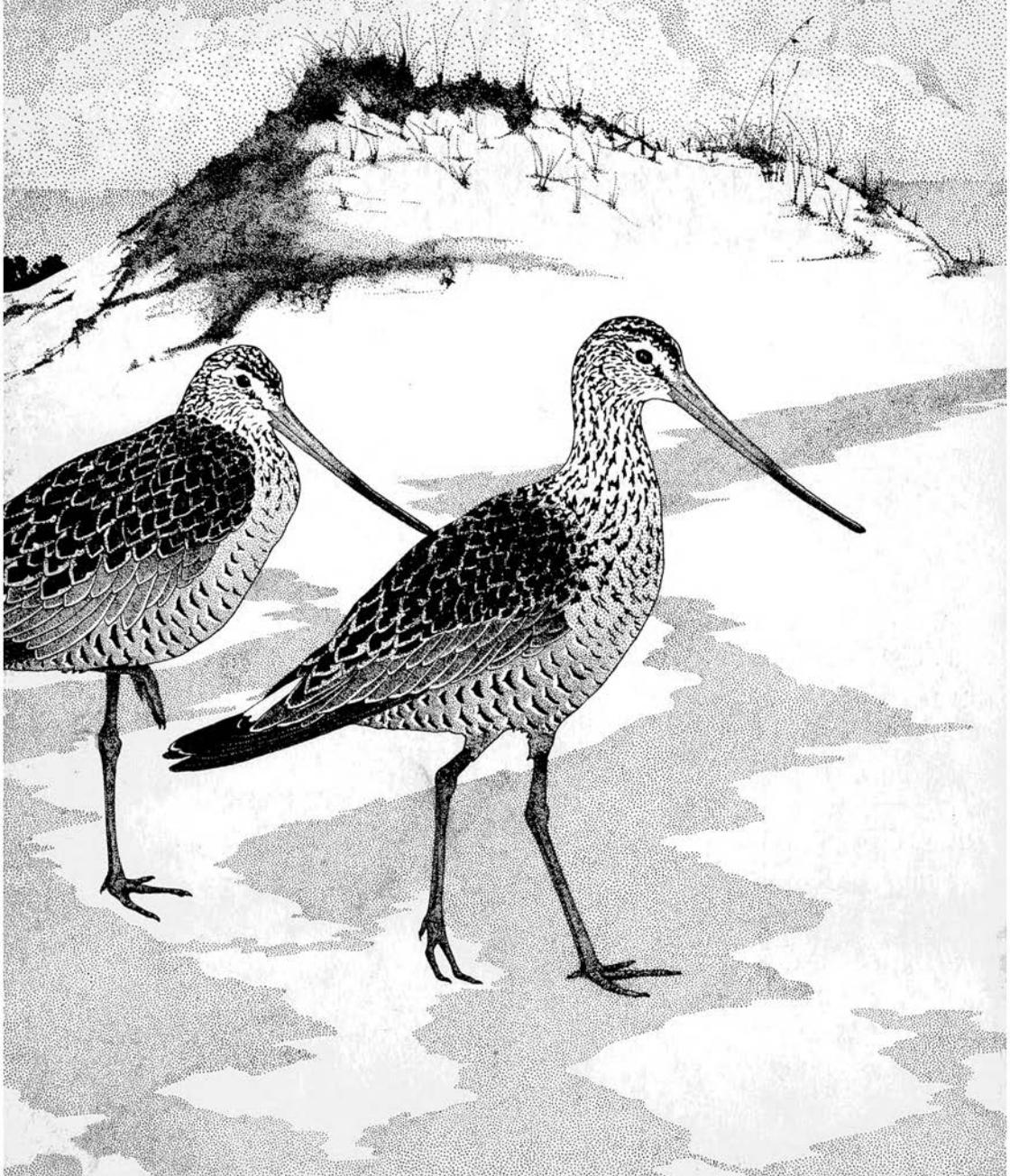
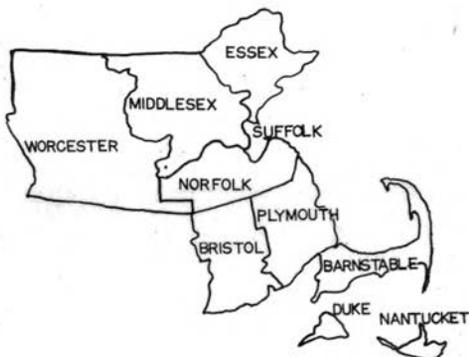


BIRD OBSERVER

OF EASTERN MASSACHUSETTS



VOLUME 6 NO. 4



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EDITOR'S PAGE
BIRDS IN AMERICAN ART

An outstanding exhibition of Birds in American Art can currently be seen at the Heritage Plantation in Sandwich, Massachusetts. The 161 original works, collected and beautifully displayed by Louis Stedman and associates, include examples ranging from early American primitives to the most popular modern artists. Pieces include a stunning Zuni owl effigy; a Tsimshian Raven rattle; weathervanes, and other examples of folk art; engravings by Audubon and Wilson; watercolors by Fuertes, Frisina, and Peterson; and a variety of outstanding pieces by Eckleberry, Coheleach, Singer, and many others. There are several Tony Angell sculptures, along with fine wildfowl carvings from the collection of George Ross Starr, Jr., and a most intriguing Turkey Vulture by Andrew Wyeth. Anyone interested in birds is strongly encouraged to visit this exhibit, which continues through October 31st. There is an admission fee of c. \$2.50 to the plantation, which includes admission to this and numerous other interesting exhibits, as well as extensive rhododendron gardens.

PELAGIC TRIPS

NORTH CAROLINA GULF STREAM

Saturday, September 2, and Sunday, September 3 leave from Oden's Docks, Hatteras Village, North Carolina. Leaders: Robert Ake, and Paul DuMont. Cost: \$30.00 per person. For reservations make check payable to: Paul DuMont, 4114 Fessenden Street, N.W., Washington, D.C. 20016. Telephone: (202)-363-8994 evenings until 1 A.M.

Another trip is planned for Sunday, October 8. All of these trips are very worth while for Massachusetts birders who have never been on a pelagic trip to the Outer Banks. Audubon's Shearwater, Bridled Tern and Sooty Tern are probable, with possible Black-capped Petrel, Noddy Tern, South Polar Skua, Sabine's Gull, Long-tailed Jaeger, White-tailed Tropicbird and maybe an albatross!

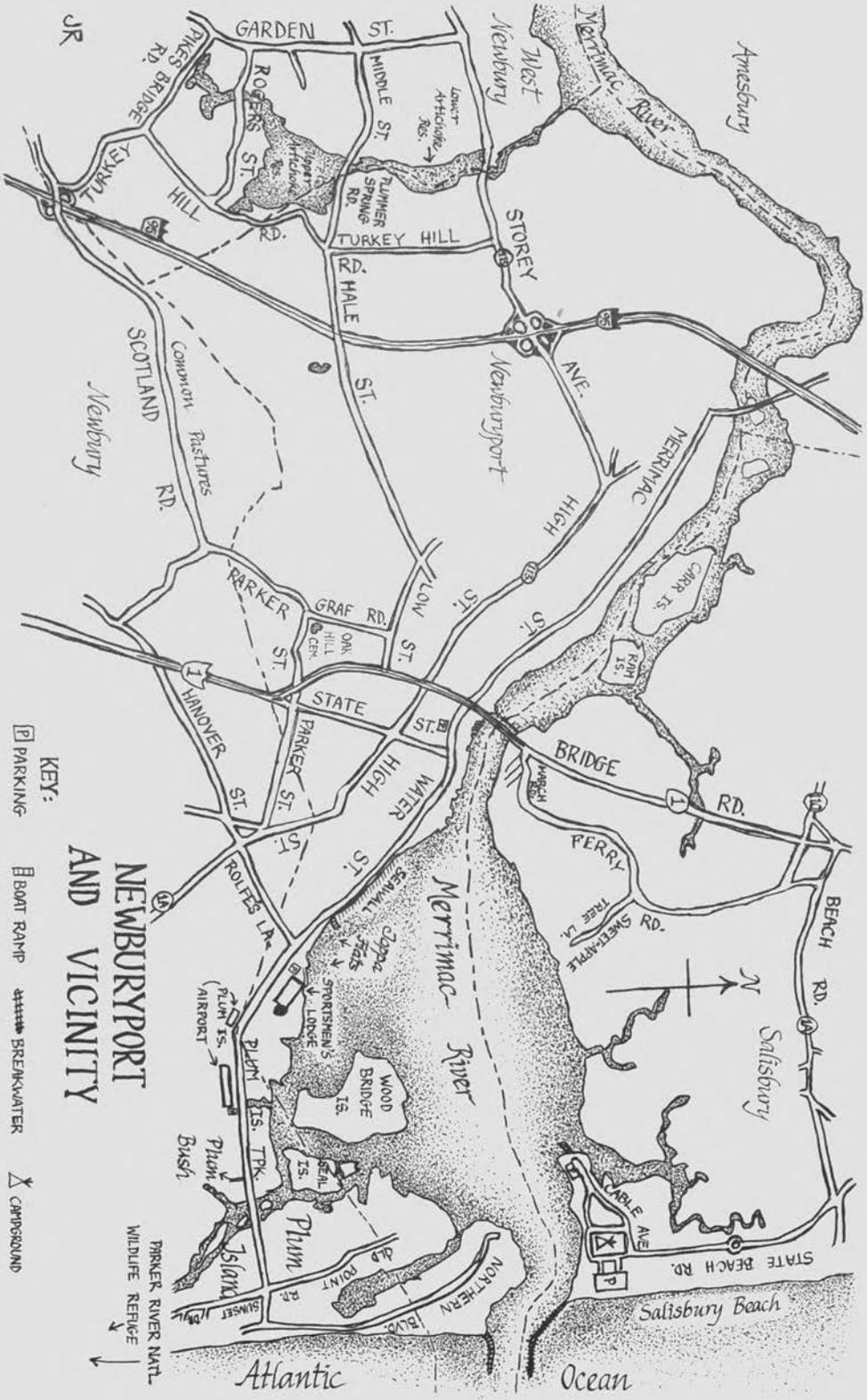
POLLOCK RIP

Sunday, September 24. Leave from Harwichport at 8:30 A.M. For reservations, send non-refundable deposit of \$7.00, payable to Herman H. D'Entremont, P.O. Box 207, Newton Centre, Massachusetts 02159. Note new telephone: (617)-734-1289.

PLYMOUTH

Sunday, October 29. For reservations, send non-refundable deposit of \$7.00 to Herman H. D'Entremont, as above.

FOR SALE: 10 x 50 CARTON WIDE ANGLE BINOCULARS w/case. \$35.00 or best offer. Also have Swift spotting scope w/4 eye pieces. \$50.00 or best offer. Contact: Bob Stymeist, 46 Beaver Street, Waltham, Massachusetts 02154.



NEWBURYPORT AND VICINITY

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OLD POINT

NORTHERN ISLAND

BRIDGE

FERRY

SWEET-APPLE
TREE LN.

RD.

WASH

RD.

NEWBURYPORT AND VICINITY

By William C. Drummond, Haverhill

Newburyport and vicinity is certainly a renowned birding area. Probably no other area in the country is so carefully birded. On almost any day of the week, at any time of the year, you are likely to see at least a few birders. And on weekends, it's not uncommon to see a hundred or more birders. This contrasts sharply with a birding trip I took out west in the summer of 1977, in which I stopped at 17 different national wildlife refuges without ever once seeing another birder.

Yet the Newburyport area is often a disappointment for an out-of-state birder who expects to see a bonanza of specialty birds in a short time. Actually there are very few of the so-called specialty birds that may be found there. The great advantage is the birding coverage -- a low probability of a "good bird" escaping undetected. And birding there is a very social experience. This fact cannot be overlooked. Your birding will be most rewarding if you stop to ask other birders for tips and significant reports. The majority will be very glad to help you.

The following self-guided auto tour of the region is intended as an introduction to the Newburyport vicinity. Newburyport Harbor and Plum Island will be the subjects of special articles in future issues of Bird Observer.

Begin at Sportsmen's Lodge on Water Street in Newburyport. To get there from Rte.1A in Newbury, turn east onto Rolfe's Lane at the traffic light and drive toward the harbor. At the end of the road (.6 miles), turn right and then look for Sportsmen's Lodge immediately on your left.

The birding can be good right from Sportsmen's Lodge parking lot, especially if the tide is "right." The best time to do shorebirding in the spring, late summer, and fall (other times are generally not productive) is about 3 to 4 hours after high tide and from about 2 to 3 hours after low tide. The Newburyport tides are listed in the local newspapers. Be careful in birding the tides! Wind or other factors may tend to hold in the tide or send it out faster than usual. It's better to allow yourself extra time before the birding becomes productive rather than to miss the tide.

But shorebirding in Newburyport Harbor (Joppa Flats) is tremendously exciting. It's especially fun to follow the tide out by walking along and 'scoping from the edge of Water Street. The tide goes out first from the area behind Sportsmen's Lodge. As the edge of the tide begins to get too far away, walk or drive from the parking lot and turn right on Water Street. Pass Rolfe's Lane which goes off on the left and stop at a few places immediately beyond. First there is a transformer and then three clam shacks. Shorebirding can be good at each of those places. Keep checking the shorebirds until you get to the boat ramp at the seawall (.8 miles from Sportsmen's Lodge).

Aside from Short-billed Dowitchers, Dunlin, Black-bellied Plover, and all the peep (including White-rumped Sandpiper), there is always a chance for

a rarity such as a Ruff or a Curlew Sandpiper. Also keep your eyes peeled for migrating Merlin, Peregrine Falcons, or other raptors. Whenever you see all the shorebirds fly up at once, scan quickly for some avian predator.

To continue the tour, return on Water Street in the direction of Sportsmen's Lodge (which, incidentally, is a fine place to eat) heading toward Plum Island. Shortly you will see Plum Island Airport on the right. Scan for hawks on both sides of the road (Plum Island Turnpike). Most of these will be Red-taileds, or kestrels, but in winter, Rough-leggeds and Snowy Owls will often be seen. During summer, Upland Sandpipers can sometimes be found, and during migration, the wet area on the left side of the road just beyond the airport can be good for shorebirds, especially at higher tides. In February and March, watch for the rare and elusive Gyrfalcon, which might make a sweep through the area. I have seen exactly one there in nine years.

The next regular birding spot is known as Plumbush, less than a mile from the airport. It is just beyond the large pink house of the J.Stott Realty. Take the next dirt driveway going off on the right. (If you come to the bridge, you've gone too far.) There is hardly a bush at Plumbush, just a couple of dilapidated hunter's blinds. But the birding can be good there. Look for Buff-breasted and Baird's Sandpipers in August and September; during the nesting season, you can walk out to where first Savannah Sparrows, then Sharp-tailed Sparrows, and then Seaside Sparrows can usually be found. If you walk out for the Seaside Sparrows, you'll need waterproof boots and insect repellent in ample supply.

The tour then continues by returning to the main road, turning right, and then crossing the bridge over the Parker River to Plum Island. At the next intersection you have three choices. In winter turn left to check for Short-eared Owls or hawks.

By going straight and then following the road as it curves sharply to the left and then continuing for another 2.3 miles after the curve, you come to the very north end of Plum Island. This area is usually good except in summer. Behind York's Tackle Shop, 'scope for sea ducks, alcids, and white-winged gulls. Most of the latter will be Iceland, but occasionally a Glaucous is seen. If there seems to be a lot of activity, and if the weather is not too cold (a big "if"), you might try walking to the right along the dunes for about a mile until you come to the south jetty at the mouth of the Merrimac River. This area is often good for Horned Grebes and Common Loons, along with the previously mentioned birds.

Turning right after the Plum Island bridge brings you to the Parker River National Wildlife Refuge. Birding on "Plum Island," as it is known universally, will be covered fully in future issues of Bird Observer.

Absolutely the best way to bird Plum Island is to time your birding there with one of the many scheduled club field trips. The Brookline Bird Club offers almost one field trip there per week all year long. Non-members are welcome and there is no charge. For information on these field trips or on any birds in the area, feel free to call me from 6:30 a.m. to 11:30 p.m. at 617-375-0292. And whatever the birding, try not to miss one of the beautiful sunsets on Plum Island in summer.

To complete your birding day, you can take two side trips, both of which begin at Sportsmen's Lodge. The first, best in spring and early summer, goes to Pikes Bridge Road in West Newbury. Pass Sportsmen's Lodge on your right and turn left at Rolfe's Lane. Turn right at the traffic light on 1A and then turn left after .2 miles on Parker Street by the Citgo station. After .5 miles turn right through the gate into Oak Hill Cemetery, an excellent spot for warblers in migration. Return to Parker Street, turn right and go to the next intersection where the stop sign has been taken down. There is a Dandy Donut Shop on the left where the coffee rolls are delicious. Go straight across Rte.1 staying on Parker Street for .5 miles until you come to another intersection. Turn left there onto Scotland Road (not marked). As you follow this road you will see fields to your right, the "Common Pastures." Upland Sandpipers breed here, as well as Bobolinks, Meadowlarks, and Black-billed Cuckoos; Rough-legged and Red-tailed Hawks frequent the area in winter.

Stay on Scotland Road for 2.9 miles and turn right onto Turkey Hill Road. (First right after I-95.) Go .8 miles and bear left onto unmarked dirt road (Pikes Bridge Road). Walk the length of this road looking for Blue-winged, Golden-winged, and Prairie Warblers, Empidonax Flycatchers, American Bittern, and Bobolinks. Be careful on the songs. I have seen Golden-winged singing the Blue-winged song and vice versa.

To check Salisbury State Beach, pass Sportsmen's Lodge and stay on Water Street. At the end of the seawall, there is room for a couple of cars to park. It's a great place to check the harbor from, and it is an excellent place for Barrow's Goldeneye in winter. Stay on Water Street, bear right at the next fork, and continue until you get to Rte. 1 until you come to Salisbury Center. Turn right onto Rte 1A, and follow this for over a mile until you see the sign for Salisbury State Reservation on your right. Turn right onto State Beach Road. In winter, the marsh to your right is frequented by Snowy Owls, often seen perched on old shacks or posts, and by Rough-legged Hawks. Driving on, you will come to an intersection. Turn right onto Cable Avenue (not marked) to get to the boat ramp where there is a large parking lot and a good view of winter ducks, including Common Eider, Red-breasted Merganser, and Common Goldeneye. Occasionally a Tufted Duck, which has seemed to favor the channels flowing into the marsh, is seen. From the boat ramp slowly drive among the campsites and you should have excellent views of Snow Buntings. Then drive to the large parking lot near the beach to look for loons, grebes, diving ducks, gulls and occasional alcid.

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RELATIVE ABUNDANCE ANALYSIS: A TECHNIQUE
FOR ASSESSING BIRD COUNT DATA

By John W. Andrews, Lexington

One of the enduring pleasures of birding is the intellectual stimulation derived from the effort to comprehend the patterns of bird distributions as they shift with the seasons or change over the years. This is one reason why many birders are meticulous note-takers who possess field journals that run back for years. The Massachusetts Audubon Society - Bird Observer statistical network receives regular reports from dozens of active birders who obviously hope that their data will be of interest to others, and that it has some value beyond the mere personal satisfaction. Insofar as such data can contribute to our knowledge of species distribution and population trends, a convenient and efficient method of quantitative analysis would be assessing actual changes in this era of massive habitat alteration.

But the bulk of such data, except for noteworthy rarities, is never compiled or published in a manner that provides a meaningful permanent record. In part, this situation is due to the problems encountered in attempting to compare observations made at different sites by different observers. A meaningful comparison requires that those extraneous factors which affect the count data (such as time afield, type of habitat, and extent of coverage) be taken into account in order to provide a valid basis for comparison. Often the form of the data or the lack of supporting information precludes this.

Consider, for instance, the supporting data which is required for normalization. Leif Robinson (1) has encouraged the use of birds per hour (BPH) as a normalizing measure of abundance. His suggestion that all records include an estimate of time afield is certainly pertinent. However, BPH can remove only the effect of the time afield. This may be the only adjustment required if all data to be analyzed were collected by a single individual at a specific place. But the comparison of data gathered in various habitats by a variety of persons may require further adjustment to account for the number of observers, area covered, and other factors.

Anyone who has participated in a Christmas Bird Count has probably been asked to provide normalizing "level of effort" data (such as number of party hours or party miles) to accompany the observations. But, in a study of CBC results, Raynor (2) concludes that this data alone is not sufficient for proper normalization. Raynor discusses a hypothetical upland count area in which a single lake provides the only waterfowl habitat. One year the count records 100 Mallards on this lake. Ten years later the count was again 100. But over the intervening decade the number of party-hours for the count as a whole rose from 10 to 100. An analyst, unfamiliar with this situation but attempting to normalize the Mallard count according to level of effort, might conclude that a disastrous decline from 10 BPPH (birds per party hour) to 1 BPPH had occurred! In order to avoid such misleading normalization, Raynor concludes that the compiler must provide additional hard-to-come-by information, such as the percentage of each type of habitat that was covered and the degree of thoroughness.

If such difficulties are encountered with CBC data, is there any hope for the retrieval of meaningful information from monthly lists submitted by an ever-changing corps of observers without any normalization information? Perhaps there is, if we focus not on the problem of normalization, which yields absolute abundances, but derive instead relative abundances. The latter type of analysis would merely ask what percentage of the total number of individuals seen was of a particular species. Relative abundance has many self-normalizing properties: the extent of the habitat covered, the number of observers, and the speed at which the party moves do not directly impact the final results.

At first glance, relative abundance may seem to be a less concrete concept than absolute abundance, but many fundamental questions concerning avian populations can be answered from a knowledge of relative abundance alone. For instance, it can be determined which species are increasing relative to others. It can also be determined how the composition of species varies from one site to another.

The determination of relative abundance is not irrelevant to the determination of absolute numbers. Once the proportions are known, it is then necessary only to postulate a number for the total population in order to compute the absolute populations of any given species. For example, if radar observations were to provide estimates of the total number of migrants in a given "wave," and if field observers were to determine the proportion of each species in that wave, then the absolute numbers of each species could be computed. In fact, though far from ideal, it is necessary to know only the absolute numbers of any one species in order to estimate the absolute numbers of all others from the relative abundance data.

A close analogy to this technique is the method used to estimate whale populations. A known number of whales is tagged. Relative abundance of the tagged subpopulation is then determined by collecting tags found on whales killed. The total whale population can then be estimated by dividing the number of tagged individuals by their relative abundance.

Occasionally one encounters studies which compare the relative abundances of two species, for example, Sharp-shinned and Cooper's Hawk, or Hairy and Downy Woodpecker. Such comparisons are generally directed toward answering a specific question that the analyst has posed. The general applicability of the pairwise technique is limited by the fact that only two species are simultaneously analyzed. This approach can be extended to accommodate a variety of species by designating one as the reference species and using its abundance to normalize the others. However, the validity of this type of normalization is highly sensitive to the characteristics of the reference species and the others may influence the results.

A less sensitive approach would be to choose several species that can plausibly be referenced to each other, and to express the abundance of each species as a percentage of the group total. Each species, therefore, contributes to the normalization of all the others. This is the most general utilization of the data and produces results which can easily be re-examined at a later date if some of the more specialized normalization techniques are desired.

The group which is chosen for analysis should consist of species which, in a given habitat, are encountered in rough proportion to their respective populations at large. Birds which tend to be found in quite different habitats should not be grouped, since the observed relative abundance would depend more on the type of habitat visited than upon the size of the populations. For example, it would be highly questionable to compare the winter abundances of Common Loon and Red-breasted Nuthatch, since the ratio of their counted numbers should be more dependent upon the ratio of sea-surface to coniferous forest habitat than upon their actual populations.

To demonstrate how a general-purpose relative-abundance analysis can be carried out, I have applied this technique to 1974 Christmas Bird Count data for four eastern Massachusetts counts. Selected for this analysis are 13 species found primarily in woodlands (woodpeckers through Brown Creeper).

The analysis requires preparation of a table (see Table 1), which contains the actual number of each species counted in each count area and the relative abundance expressed as a decimal fraction of each count; the final column gives similar data for four counts combined. In the absence of additional information, we proceed upon the hypothesis that the data reported from each site are random samples from populations with uniform species distributions. If this were the case, then the relative abundance of each species at each site would approximate the relative abundance of all sites, differing only by variations in the sampling procedures. The best estimate of the true relative abundance of species would then be obtained by combining data from all sites, as in the final column of Table 1.

At this point it is worthwhile to consider the extent to which the data are consistent with the hypothesis of uniform species distribution. By comparing the relative abundances for each count area with the average in the final column, instances can be found in which the differences between individual sites and the combined average are too great to be attributed to sampling error alone. An effective way of examining such differences is to plot the data for individual sites against the combined data, as in Figure 1. A logarithmic scale is used to accommodate the wide range of relative abundance, and the diagonal line indicates where site data must lie in order to coincide perfectly with the combined data.

The tendency of the site data to cluster most near this line is striking, indicating that there is a great similarity between most species distributions for the four sets of data. Nevertheless, there are some notable deviations from the trend--such as the overabundance of Red-breasted Nuthatches reported from Millis, and the underabundance of Common Crows from Worcester. Are these due to normal statistical variation in the samples, or should we look for other explanations? How much variation is significant?

Fortunately there exists a simple statistical measure which indicates the amount of variation to be expected. Let RA be the relative abundance observed at a particular site for a certain species. The amount of variation in RA to be expected due to sampling error can be expressed in terms of the standard deviation of RA, which is derived from observations of all birds at that site. This standard deviation is given by:

$$sd = \sqrt{\frac{RA(1-RA)}{\text{total count of all species at the site}}}$$

EXAMPLE: For the Millis count of Tufted Titmouse,

$$sd = \sqrt{\frac{0.123(1-0.123)}{893}} = 0.011 \text{ or } 1.1\%$$

In other words, the Millis estimate of the relative abundance of the Tufted Titmouse is .123 with an uncertainty of .011=1.1% (one standard deviation).

Note that the more birds one counts, the smaller is the standard deviation, hence the more accurate the estimate of the relative abundance.

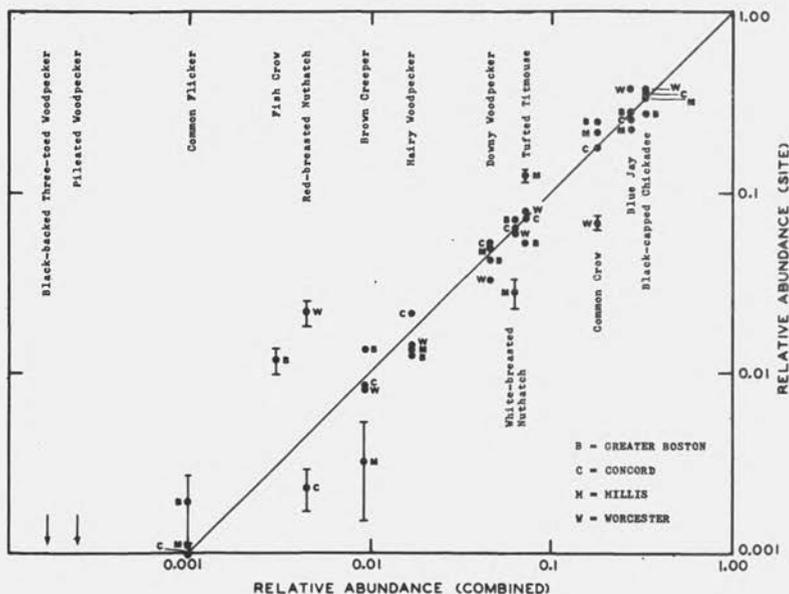


FIGURE 1: Plot of relative abundance at various sites versus combined relative abundance.

TABLE 1: Relative Abundance Data for Four Eastern Massachusetts Christmas Bird Counts (13 selected species)

	CONCORD		GREATER BOSTON		MILLIS		WORCESTER		COMBINED	
	count	RA	count	RA	count	RA	count	RA	count	RA
Common Flicker	5	.0009	6	.0019	1	.0011	0	.0000	12	.0010
Pileated Woodpecker	2	.0004	0	.0000	0	.0000	1	.0006	3	.0003
Hairy Woodpecker	120	.0210	39	.0126	12	.0134	25	.0138	196	.0170
Downy Woodpecker	293	.0513	130	.0419	44	.0493	59	.0325	526	.0457
B-b. 3-toed Wpckr.	2	.0004	0	.0000	0	.0000	0	.0000	2	.0002
Blue Jay	1,443	.2528	838	.2699	195	.2184	657	.3622	3,133	.2720
Common Crow	997	.1747	772	.2486	193	.2161	122	.0673	2,084*	.1809
Fish Crow	0	.0000	36	.0116	0	.0000	0	.0000	36	.0031
B-c. Chickadee	1,994	.3493	856	.2757	310	.3471	646	.3561	3,806	.3304
Tufted Titmouse	409	.0717	165	.0531	110	.1232	138	.0761	822	.0714
W-b. Nuthatch	382	.0669	221	.0712	25	.0280	112	.0617	740	.0642
R-b. Nuthatch	13	.0023	0	.0000	0	.0000	39	.0215	52	.0045
Brown Creeper	48	.0084	42	.0135	3	.0034	15	.0083	108	.0094
INDIVIDUALS	5,708		3,105		893		1,814		11,520	
PARTY HOURS	191		143		48		77		459	
BIRDS/PARTY HOURS	29.9		21.7		18.6		23.6		25.1	

As a rule of thumb, if the observed relative abundance is more than two standard deviations from the value of the combined data, then there is a strong indication that something other than normal statistical variation is at work. In Figure 1 vertical bars are drawn around certain data points to indicate plus and minus one standard deviation for those points. Note that the plot indicates that the high count of Common Flicker at Boston could easily be due to normal sampling error, but that the high count of Tufted Titmouse at Millis is almost certainly not due to sampling error. (In support of the latter conclusion, see Robinson's analysis of the relative abundance of Cardinals and Titmice (3).)

In Table 1 it can be seen that the Concord count had a total birds-per-party-hour that was 61% greater than that for Millis (29.9 to 18.6). Nevertheless, the relative abundances reported from Millis are reasonably consistent with those from Concord. In such cases the differences in the absolute abundances may be due to less extensive habitat or less concentrated effort. The count of Tufted Titmouse at Millis, for example, probably deserves to be called a "high" count on the basis of its relative abundance, even though on an absolute scale it is about equal to the count at Concord. Also, despite the fact that Concord has traditionally reported the highest CBC counts of Blue Jay, albeit not in 1974, in relative abundance Concord ranked below the Worcester and Greater Boston counts!

Any observer who has kept careful records can readily compute relative abundances for his data and compare it with the results of others. In some cases a few minutes with a hand calculator is all that is required to turn a list of incomprehensible numbers into a meaningful statement. We should all strive to put the birding data we are producing to better use. I think relative abundance analysis can help us in this effort - why not give it a try?

REFERENCES:

1. Robinson, L.J., "Some Thoughts About Counting Birds," Bird Observer of Eastern Massachusetts, Vol. 5, No. 4, July-August, 1977.
2. Raynor, G.S., "Techniques for Evaluating and Analyzing Christmas Bird Count Data," American Birds, Vol. 29, No. 2, April, 1975.
3. Robinson, L.J., "Cardinals and Titmice," Bird Observer of Eastern Massachusetts, Vol. 2, No. 1, January-February, 1974.

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PRELIMINARY REPORT: INLAND AUTUMN MIGRATION OF RING-BILLED GULL

by L. J. Robinson, Wellesley

In 1976, from late August through year's end, J. Hines and the author often counted Ring-billed Gulls at Norumbega Duck Feeding Area, located in Weston on the Charles River. These observations revealed a sharp peak in mid-October followed by a steady decline--about every two weeks the population was halved. (Mathematically, the maximum number (N) of Ring-billed Gulls present decreased as $N \propto e^{-0.06t}$, where e is the base of natural logarithms and t is the number of days elapsed since October 15th.)

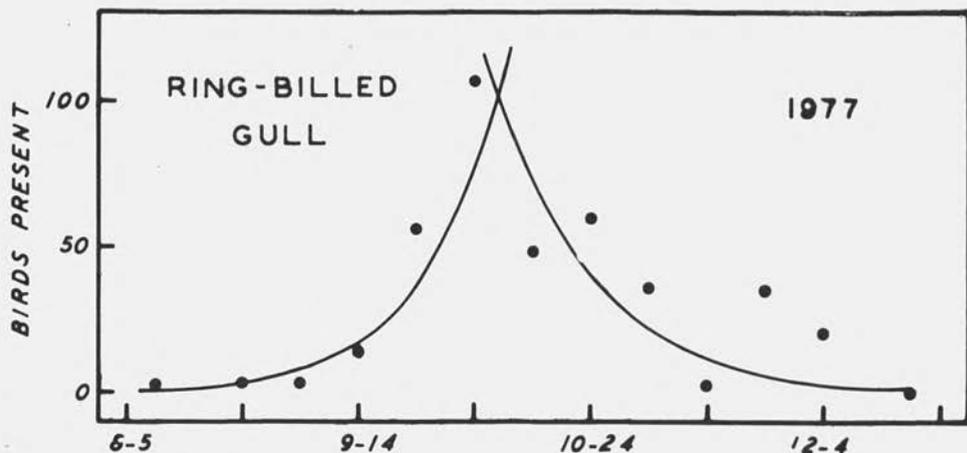
Between August 2, 1977, and December 24th (after which the duck feeding area became virtually ice-covered and inaccessible), the author made 160 counts of Ring-billed Gulls, 80 per cent being taken while traveling to or from work. Since it is well known that gulls undertake diurnal migration, the observed morning and evening counts were adjusted (based upon actual mid-day counts) to reflect the maximum number of birds that were probably present each day (details available upon request). The results were then averaged, and again a power law was fitted to the data. As the accompanying graph shows, during the early stages of migration (August 2 to October 9), the maximum Ring-billed Gull population doubled every 10 days (that is, $N \propto e^{0.07t}$). From September 30 to December 24 it decreased as $N \propto e^{-0.06t}$, the same relaxation constant as determined in 1976! The overlap in dates is due to the inclusion of the peak count in both calculations.

The maximum number of birds observed in 1976 was 117, on October 17th; the peak in 1977 occurred on October 2nd, when 195 Ring-billed Gulls were present. These high counts agree nicely with the intersection of the curves from the two power laws, which were derived from several months of data. Hence, it seems that the Ring-billed Gull migration in Weston (and probably all of Massachusetts) peaks during the first two weeks of October. This assessment is supported also by generalizations in Birds of Massachusetts (Griscom and Snyder, 1955) and Birds in Massachusetts (Bailey, 1955).

The picture may not be quite so clear-cut, however. In the diagram, note the rather pronounced secondary hump in late November. My records show that it included a significantly larger proportional number of adults than did the October peak. In addition to annual and diurnal factors affecting the actual numbers of gulls seen, there is also the human influence, such as feeding on daily, weekly, and seasonal cycles. Indeed, the analysis of this kind of data is extremely complex.

From where do these birds come? In October, 1976, J. Hines found two Ring-billed Gulls with bands, and thanks to Charlotte E. Smith it was learned that they were banded that June "when too young to fly" near Willsboro, New York, on the southwestern shore of Lake Champlain. And how is the Ring-billed Gull doing in the Northeast? The first record for this species at the Norumbega Duck Feeding Area was not obtained until 1965; 13 years later nearly 200 were counted! Like the Herring Gull, the Ringer continues its dramatic population explosion.

Are there other local day-by-day records of Ring-billed Gull to confirm the autumn migratory pattern observed in Weston? Also, though the exact nature of diurnal migration is uncertain, this species seems to follow a repetitive and predictable pattern. More data are needed!



The highest counts of Ring-billed Gulls observed at Norumbega Duck Feeding Area, Weston, are plotted at 10- or 15-day intervals. The curves have been fitted by least squares for the interval August 1 to October 9 (correlation coefficient $R^2 = 0.86$) and September 30 to December 29 ($R^2 = 0.57$).

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1978 FALL HAWK WATCH

You are invited to participate in the third annual Eastern Massachusetts Fall Hawk Watch. This year the watch will be in three parts. Coordinated watches will be conducted throughout New England on the following weekends: Sept. 9-10, 16-17, 23-24, Sept.30-Oct.1, and Oct.28-29. The extra weekend in early September has been added because, during the past three years, good flights have been observed quite early in the month.

Secondly, on the weekends of Sept.16-17 and 23-24, we will maintain an observation line from Salisbury through Amesbury, Haverhill, North Andover, Chelmsford, Littleton, Groton and Ashby, to Ashburnham, and a close-site line in Harvard, Ayer, Princeton, Clinton and West Boylston. These are the weekends when we plan to have our most comprehensive coverage.

Thirdly, a consecutive-day watch will be maintained on the summit of Mt. Wachusett, in Princeton, from Sept.9th through October 1st. This is an ambitious project, requiring a number of volunteers to commit themselves to observing on one or more weekdays. Last year the consecutive-day watch tallied more than 3300 hawks in only 19 days, including inclement weather. If you have not been to Mt. Wachusett, there is an excellent road to the summit, where the parking lot provides good views in all directions.

Volunteer observers are needed for all dates, including the weekday watch at Mt. Wachusett. Don't hesitate to participate if you don't feel confident about your ability to identify hawks. The watch attempts to station two or more people at each site. If you wish, you can be stationed with more experienced observers who would be able to help you learn the techniques of field identification while you help spot birds. Studying hawks during migration is the best way to become familiar with them. Even if you can't identify a majority of the hawks you might see, it is still important to know that there was substantial activity at a particular site. If you'd like to review your knowledge of hawk identification with others, on September 10th, at Mt. Wachusett, there will be an informal discussion of field identification.

If you are interested in participating, please contact:

Paul M. Roberts
24 Pearson Road
Somerville, MA. 02144 (617) 776-8566

Please indicate what dates and where you would like to watch: either at a site mentioned above, another site (perhaps a favorite local spot), or note if you'd be willing to go wherever your presence would be most valuable. (At N.Andover, Chelmsford, and Ashburnham, volunteers are required to hike uphill from their cars.) Please notify Paul as soon as you've decided on your dates and sites. If possible, commit yourself to one or more dates now; you can always add other dates later.

Finally, if you observe any significant hawk flights or uncommon individuals during the season, Paul would be most grateful if you would send him a brief note describing what species were seen, how many of each, in which direction they were flying, and what the weather conditions were.

CONFUSING FALL WARBLERS (CFW'S)

A Quiz

1. What is the only CFW that has a white eye-ring in conjunction with a yellow throat?
2. What is the only CFW that has a yellow breast and whitish belly?*
3. What is the only CFW that has a complete eye-ring and a suggestion of a hood?
4. What is the only CFW that has yellowish tail spots?
5. What is the only CFW that has a broad white band on its tail broken midway by black rectrices?
6. What is the only CFW that has a lemon-colored shade of green on the back and white underparts?
7. What is the only CFW that has enough dusky at the edge of the throat to act as a frame for the bright yellow cheeks?
8. What is the only CFW that has light stripes on its back?
9. What is the only CFW that has tail spots and constantly flicks its tail up and down?
10. What is the only CFW (male only) that has buffy under-tail coverts?
11. What CFW is known by the combined characters of unstreaked yellowish breast and conspicuous yellowish line over the eye?
12. What CFW has dim yellow patch behind the ear, plain back, yellow to yellow-green rump, wing bars, heavy streaks on breast?
13. What CFW has large white wing-bars, unstreaked back, white belly, white undertail coverts, faint eye stripe, and black legs?
14. What CFW does this quote from Peterson describe? "In any plumage the gray color of the upper parts in connection with the total lack of white in the wings and tail is conclusive."
15. What CFW has olive-green above, dingy yellow below--faintly streaked, white wing bars, streaked back, white undertail coverts, and pale legs?
16. What CFW has olive above, yellow spectacles, and yellow undertail coverts?
17. What CFW is bluish and yellow and has wing bars?
18. What CFW is a small, plain warbler with olive-green above, bright yellow below, yellow eyebrow stripe and has no outstanding marks of any kind--i.e. no streaks, wing-bars, etc.?
19. Name two CFW's common in our area that have triangular cheek patterns?
20. What CFW is very plain, buffy-breasted, dark-backed, and has the dark-cheeked look?

*(This could possibly be challenged. Another CFW also has a white belly but we won't quarrel with Mr. Peterson.) (i.e. Prothonotary)

Patricia N. Fox, Lexington
Charlotte Wyman, Belmont

Answers will appear in the next issue.

THE SPRING SUMMARY, 1978

March was cool, snowy and sunny. The temperature averaged 36.2°, 1.9° below normal, the lowest for March since 1969 (35.4°). The high mark was 60° on the 21st and the low was 26° on the 2nd and 5th. This "lamb-
-lion" month began with the first 10 days all on the cold side, averaging 8° below normal. Mid-month warmed to near normal while the final weeks averaged 2.5° on the warm side. Precipitation was but 2.46", 1.55" under normal, but the driest March only since 1976. Snow totaled 16.1", double the past average of 8.1" and the most in March since 1970 (18.2"). The heaviest snowfall was 9.2", on the 3-4th. Easter Day, the 26th, brought 1.3", the most snow on Easter since the record 7.3" in 1970 and the 4th greatest Easter total in 98 years. Seasonal snowfall reached 85.1", the second greatest in 88 years of record (89.2" in 1947-48). Snow covered the ground continuously for 65 days ending March 19. This broke the 62-day record set in 1976-1977.

April was sunny and dry with near normal temperatures. The mercury averaged 48.8°, just 0.2° above normal and 2.5° colder than last April. The warmest day was the 13th, when 75° was registered--12° above normal. The lowest temperature was 29° on the 3rd, which was the only day below 32° all month. Precipitation totaled only 1.79"; this was the driest April since 1968 (1.72"). Southwesterly winds occurred on the 4th, 17th and 20th.

The month of May was a little on the warm side, with plenty of rain and sunshine. The temperature averaged 59.3°, 0.7° above normal but 3.3° cooler than May 1977. The high was 86° on the 29th. This year's 80° readings did not come until the 20th, unusually late. The low was 37° on the 1st. Rain totaled 4.50", 1.03" over normal. The most in any day was 1.73" on the 15th. Winds from the south, southeast and southwest occurred on the following days: 4, (SE); 6, (S); 8, (SW); 9, (S); 12, (S); 19, (SE); 20, (SE); 24, (SW); the 28th, 29th and 30th (SW).

A waft of particularly early shore-bird and passerine migrants, principally species wintering in the southeastern United States, characterized the latter portion of March and early April; although this pattern far from typified the spring migration as a whole. In terms of pronounced "waves," this year's migration was notably meager--the overall impression being that the bulk of the passerine migrants either trickled through slowly or by-passed eastern Massachusetts altogether. Whereas many species arriving from comparatively proximate wintering quarters during April did so somewhat ahead of schedule, those species returning from the tropics tended to arrive either on schedule or slightly later--and frequently in diminutive numbers. A northeast storm on May 15 brought a waylaid "wreck" of phalaropes to Essex County, though apparently intercepted few other migrant pelagics. Unseasonal northeasters in May will hopefully continue to give valuable insight concerning the migratory periods of the various pelagic species of the continental shelf.

LOONS THROUGH CORMORANTS

Ten lingering Common Loons were reported from the shoal waters of Martha's Vineyard May 27-29 (SSBC-JFK#), with 8 noted as late as May 14 in Clinton (HLM). Six Red-throated Loons were counted at P.I. May 23 (RAF,

RHS, RRV). Red-necked Grebes, although abundant, were more locally distributed this year than last, with maximum counts of 248, 237 and 253 at Manomet Point March 28, April 7 and April 16, 66 at Marblehead April 16-30 (MJK), 140+ at Dennis April 4 (BN), but few elsewhere. Counts of migrant Horned Grebes included 125+ at Marblehead April 9 (MJK) and 118+ at Manomet April 18 (staff), a bird occurred inland at Framingham April 4 (KSH), and one lingered at Dennis until May 25 (Peter Trull). Three Northern Fulmars were seen off Provincetown April 22 (HHD'E), one in Cape Cod Bay April 29 (VL), and four were seen from shore at Rockport May 15 during the NE storm (RHS). A Sooty Shearwater at First Encounter Beach April 28 (VL) was perhaps a northern hemisphere winterer; otherwise the earliest perceived were 3 from Provincetown May 25 (HLM) and 8 at Martha's Vineyard May 28 (CJ). Single Manx Shearwaters were noted at Marion May 13 (RAF, ICTN), Winthrop May 14 (SZ, CJ), Sandy Neck May 15 (RFP) and P.I. May 20 (HC) and May 28 (HLM). A Leach's Storm-Petrel was seen from Rockport May 15 (RHS) and 5 were noted there the next day (GLS). One thousand Gannets April 13 at Provincetown (R. Prescott) was the largest total noted, while 143 were counted at P.I. May 14 (PMR) and 400 were seen from Rockport the next day (RHS). One hundred Great Cormorants were seen migrating north at Eastham April 15 (CAG), while May stragglers included four immatures at Scituate on the 6th, where one remained until the 20th (WRP), and 3 adults in breeding plumage seen flying past Rockport on the 15th (RHS). A Double-crested Cormorant at E. Harwich March 19 was quite early (BN), while migrants were noted throughout April and during the first week of May, with the maximum counts being 172+ (JB, v. o.) at Littleton and 380 at P.I., both April 13, 350 at N. Scituate April 24 (GRF), 1000+ at Scituate (WRP), 85 at Clinton April 19 (HLM), 22 at Cambridge April 29 (MD) and 75 at P.I. and 20 at Plymouth May 6 (ES, SG #).

HERONS THROUGH WATERFOWL

Great Blue and Green Herons were both reported in near-average numbers; as usual, quantification of these species is impossible due to the arbitrary nature of our reporting procedures, and therefore only drastic fluctuations in totals are ultimately detectable. The following is an enumeration of the other, more gregarious, and therefore more accurately censused, species:

Little Blue Heron:

April 4, 8	Manchester, N. Scituate	1 ad., 1 ad.	PP#, RRV + MJL
April 27, 30	Essex	2, 1	R. King, MB + DB
May 6, 13-20	Duxbury, Nantucket	1, 1 ad.	WRP, EFA + CA
May 14-18, 14-16	Squantum, Bolton	1-2, 1 ad.	LJR#, HLM
May 20, 23	Manchester, P.I.	1, 1 ad.	G. Hotz#, JM

Cattle Egret:

April-May	9 localities	27 ⁺ indiv.	v. o.
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Great Egret:

April-May	7 localities	19 [±] indiv.	v. o.
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Snowy Egret:

April-May	4 localities	90± indiv.	v.o.
April 1+11, 24	Bolton, Lancaster	1+1, 1	HLM

Louisiane Heron:

April, 26, 29	Nantucket, P.I.	1, 1	EFA + CA, FRH#
May 10, 20, 27	Nantucket	1, 1, 1	CA#, EFA
May 11, 20	Orleans, N. Scituate	1, 1	VL#, WRP

Black-crowned Night Heron:

April 10	Clark's Is., Plymouth	1st egg in nest	BAH#
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Yellow-crowned Night Heron:

April 16-25, 30	Marshfield, P.I.	1 ad., 1 ad.	Cynthia Krusell#, HLM
May 23	P.I., Cambridge	2, 1 imm.	PI, LJR
May 28	Nantucket	1 imm.	CJ

Least Bittern:

May 17	P.I.	1	GLS
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American Bittern:

April-May	10 localities	13 indiv.	v.o.
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Glossy Ibis:

April-May	8 localities	190± indiv.	v.o.
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The migrating peak of Canada Geese at P.I. was 2000 noted there April 15 (BBC, VA). Brant totalled 500 in Newburyport Harbor throughout April, dwindling to 150 by May 31, and elsewhere 3 flocks totalling 730 birds were counted along the coast from Squantum-Eastham during April. The P.I. Snow Goose flock built up to a maximum of 1130, with 3 "Blue Geese" April 16 (RRV); additional reports included 63 in Framingham April 1 (KSH), 34 at Concord April 3-5 (Dave Hill), 450 with 1 "Blue" over Lincoln April 12 (RAF), 110 the same day at Concord (JB), and 80-90 over MNWS April 11 (MJK). The only concentrations of Gadwall were 28 at P.I. March 22 (v.o.) and 10 at Plymouth March 10 (SH), while "several" pairs were present at P.I., as was one pair at Framingham (RAF), throughout April. Pintails peaked at 120 at P.I. April 20 (v.o.), where one pair was sporadically observed through May as well. Additional likely breeding waterfowl at P.I. were one pair of Green-winged Teals observed throughout May, several pairs of Blue-winged Teals, at least one pair of N. Shovelers and 18 Ruddy Ducks were seen there May 20 (HTW). Two Green-winged Teals were also observed in Scituate May 21 (SSBC, RL). Three "Eurasian" Green-winged Teals occurred in the state this spring: one adult male with 180 Green-winged Teals at P.I. March 23 (WRP, RAF#), and two adult males at Marshfield with 300 Green-wingeds April 2 (WRP#). Intriguing was the discovery of an adult male Garganey at Marshfield

April 1 (GRF#). Although the date of occurrence is suggestive of a bona fide vagrant, captive Garganeys are so numerous on this side of the Atlantic as to preclude true determination of any individual bird's origin. Observers are hereby warned that "apparently wild" behavior on the part of a duck or other bird is by no means proof of its natural origins. As an example, a Ruddy Shelduck (a species of eastern Europe which could not possibly be expected to reach North America on its own) was seen at P.I. in April, 1977. This escaped cage bird was wary in the extreme, was associating with Canada Geese, and could not be approached any closer than 400 yards without flushing. Since proof regarding the origins of potential vagrant waterfowl may only be presented in the negative sense, the dilemma regarding the identification of bona fide vagrants may remain unresolvable. This should not, however, discourage observers from reporting these species which may in fact be actual vagrants; the accumulation of records of a certain species at a likely season (as in the case of Tufted Duck) may ultimately lead to valuable insight regarding the nature of migratory patterns. A sight record of an adult male Cinnamon Teal at Monomoy May 11 was received (Seth Mott); although lacking in corroborating details, it would represent a first Massachusetts record. A female Wood Duck with 12 young was observed April 5 in Norfolk (RMB). Migrant Ring-necked Ducks were somewhat more plentiful than usual in the Sudbury Valley, where a peak of 336 was noted April 9 (RAF). Other totals included 200+ at Carver April 2 (BBC-DD) and 80+ at Lakeville April 9 (WRP), while two lingered at P.I. until May 20, as has seemed typical in recent years.

Canvasback:

April 1-9	Newburyport	120	PMR
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Lesser Scaup:

March 18, 26	Falmouth, Halifax	50, 2	HLJ, WRP
April 13, 17	Halifax, Wayland	21, 2	WRP, RAF

Common Goldeneye:

March 25, April 9	Newburyport	5000+, 4500+	WRP, RSH
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Barrow's Goldeneye:

March-April 23	Newburyport	3 (1 ad. m., 1 ad. f., 1 imm. m.)	v.o.
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Oldsquaw:

April 9, May 27	Newburyport	4000, 17	RSH#, JWB
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Harlequin Duck:

Thr. March until May 11	E. Orleans, Magnolia	5, 6	v.o., v.o.
March 12-18, 18	Marblehead, Martha's V.	3, 1	MJK, Klunks
March 5-April 30	N. Scituate-Cohasset	1-2	BAL, MFL
May 14, 20	Gloucester, Rockport	1 m.+ 2 f., 2	MLB, RH + DH

Common Eider:

March 31, April 7	Plymouth, Scituate	6000, 1500	HLM, RRV#
April 8, 29	Plymouth, N. Scituate	1000+, 600+	MBO staff, WRP#
May 20	Wollaston Bay	<u>3000+</u>	WRP

King Eider:

March 5, March 5- April 8	Plymouth, N. Scituate	1, 2-1	JJC, WRP + RRV
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White-winged Scoter:

April 27	Nantucket	200	CJ
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Surf Scoter:

April 13, 27	Nahant, Nantucket	25, 30	RHS#, CJ
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Black Scoter:

April 14	P.I.	75	HLM#
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Hooded Merganser:

March		40 indiv.	v.o.
May 14	Lakeville	1 f.	WRP

Common Merganser:

March 4, 12	Chatham, Newburyport	25, 100+	KSA#, WRP#
April 8, 9	E. Douglas, Brookfield	42, 50	NEM, HLM
May 4	Lincoln	10	RAF

Red-breasted Merganser:

May 14, 27-29	P.I., Martha's V.	85, 35	HLM, BBC-JFK
May 28	Monomoy	150	WRP

RAPTORS

One of the major problems in interpreting field records is evaluating the extent to which larger totals reveal an increase in the number of "observer hours" rather than in the actual bird population. This is particularly true for the hawk reports this spring. Totals for most species were unexceptional during March, but April was a different story. Participants in the Eastern Massachusetts Hawk Watch (EMHW) devoted more than 225 hours to observation during that month. With this organized coverage far exceeding that of previous springs, totals for many species were considerably higher than those recorded during the past five years. Fewer watches were held during May, and that, in conjunction with the normal decline in hawk migration, produced more typical May counts.

Turkey Vulture reports were normal for March (9), with 4 observed in Sharon on the 29th (NTW). Any lingering doubts about the successful

expansion of the Turkey Vulture into the northeast should be resolved by the April total of 75 (cf. 6, 5, 16, 10 & 17, since 1973), a sum which drew little from the EMHW reports. Sixteen were seen at Quabbin on the 9th (KSA, TLL'E), and 7 in S. Harwich on the 24th (VL). Eight singles were reported in May. The first spring Black Vulture report in two years came from W. Harwich on April 24th, when the bird was seen in a flock of 7 Turkey Vultures (VL).

Seven Goshawks were reported during March, and 11 in April, including a nesting pair in Framingham and one nesting pair in the Boxford vicinity (RAF). Seven were seen in May. Sharp-shinned Hawks were sparse in March (7), but plentiful in April (180). Twenty-five were seen in Truro on the 21st (BN, VL), and a major flight occurred on April 29th, when 24 were seen at Plum Island (PMR, JSR), and 20 in N. Scituate (WRP). The peak flight of the season occurred on May 1st, when 96+ were counted at P.I. (MHM + v.o.). The May total was 113. Cooper's Hawk reports were quite heartening. Five singles were reported in March, but 23 were seen in April, including 2 in Ashburnham on the 21st (WRP, PMR), and 2 at P.I. on the 29th (PMR, JSR). If these reports are accurate, the Cooper's-Sharpshinned ratio for the month was greater than 1:8, an extraordinary figure considering the status of the Cooper's Hawk in the northeast. Only 1 was reported in May.

Thirty-six Red-tailed Hawks were reported in March, 26 in April, and only 18 in May, with the peak count, 5, in Marshfield on April 23rd (SSBC, MFL, BAL). Red-shouldered counts were up substantially; only 10 were reported from March through May, 1977, but this year 10 were reported in March, 23 in April, and 19 in May. Three were seen in Bridgewater on April 13th (GRF), and 3 in Ashburnham on the 30th (PMR, JSR). Encouraging numbers of immature "shoulders" were seen in late May, including 3 in Belmont on the 28th (NC#) and 3 in Essex County on the 29th (NC#). Broad-winged Hawk tallies clearly reflect the more extensive field observation. The first Broad-winged Hawk of the season was reported on April 13th, with 249 birds reported for the month. The biggest April flights were seen in Ashburnham, with 46 on the 21st, 64 on the 23rd and 25 on the 30th (PMR, JSR). Scattered reports indicate that the peak Broad-winged Hawk migration probably occurred between April 23rd and 25th, but the latter two days were not well-covered. Most May Broad-winged Hawk reports came from the Cape, where 60 were seen between Wellfleet and Provincetown on the 20th (BN). Seventy-five, presumably many of them repeats from the previous day, were seen flying in the reverse direction on the 21st (BN), but 40 Broad-winged Hawks were still seen at Provincetown on the 22nd (PTA). Fifteen Rough-legged Hawks were seen in March, including 3 at Bridgewater on the 5th (WRP), but only 1 was reported in April, from Marshfield on the 2nd (DTB), and 1 on the 21st of May, also in Marshfield (SSBC, RL).

An adult Golden Eagle was frequenting the W. Newbury region between April 5th-10th (HW, v.o.). Seven Bald Eagles were reported during March, including 5 immature birds seen at Quabbin on the 25th (CJ). An immature Bald Eagle was discovered feeding on fish carcasses on the melting ice at the GMNWR on March 29th (SAP). Early the following morning, another immature Bald Eagle joined the first on the ice, competing with crows and gulls for the scattered fish remains (PMR). Five were seen in April, including 3 at Quabbin on the 9th (TLL'E), KSA), and 1 immature bird was seen at Provincetown on May 27th (WRP).

Eighteen Marsh Hawks were seen during March, including 12 between Wellfleet and Provincetown on the 29th (BN, CAG). The April harrier count reflects the work of the EMHW. Forty-seven were reported during the month, with 6 migrants tallied daily on the 2nd, 9th and 13th (PMR, JSR), and 7 on the 29th (RMB), all at Plum Island. Twenty-two were observed during May. The first Osprey was reported from Wellfleet on March 29th (BN, CAG), with April producing the best spring tally for at least 6 years, 136 (cf. 9, 33, 25, 42,--). Twenty-two migrating Ospreys were observed in Ashburnham on April 17th and 23 on the 21st (PMR, JSR). Six nesting pairs were reported in Westport (SPG). Apart from that breeding colony 10 Ospreys were seen in May, including 8 on the outer Cape on the 20th (BN).

An immature gray Gyrfalcon was seen in Newburyport, on March 12th (RCH#). The bird had apparently just taken a Black Duck, and was discovered flying to Woodbridge Island, where it spent 1 1/2 hours eating the duck in full view of a small army of observers. Peregrine reports have to be considered disappointing, in view of the coverage. Only 1 bird, an adult, was seen during March, at Dennis, on the 14th (VL). Five singles were reported in April and 4 in May, the totals in May being average with 2,5,3,2, and 4 reported during the past five years. Six Merlins, all singles, were observed in March, but there was a good flight in April (53). Eight were seen at P.I. on the 12th, and 12 on the 29th (PMR, JSR). On the latter date, an adult male was observed eating prey while in flight (prey item unidentified). Thirty-eight Merlins were seen during May, including a report of 25 on P.I. on the 1st, the date of the big sharpshin flight (DCA). American Kestrels totalled 32 during March, including 12 migrants at P.I. on the 23rd (RSH). Three hundred thirty-nine+ American Kestrels, an apparent state record, were observed at P.I. on April 12th (PMR). Regrettably, the count did not begin until 8:45 a.m.; casual observers reported a steady stream of kestrels moving up the island as early as 8 a.m.. The published state record was 152, seen in the Sudbury Valley by Karplus on 4/24/47 (LG). Another good flight, 119, was observed on the 29th (PMR, JSR). The April total was 904, of which more than 800 were seen at Plum Island. Forty-five were reported during May, including 29 on May 1st at P.I. (MHM#).

GROUSE THROUGH SHOREBIRDS

Following an apparently prolific breeding season last year (see New England CBC results), two Ruffed Grouse were seen unusually close to urbanization in Belmont April 11 (PRB#). Single Clapper Rails were found at Marion May 28 (GWG) and at P.I. May 29 (JWB, JN). King Rails, however, seem to be gradually withdrawing as a breeding species from eastern Massachusetts. Only two reports were received this spring, one at Harwich May 19 (BN) and one reportedly heard at Lynnfield May 20-27 (BK, RPE#). King Rails have not been recorded from their former breeding ground at P.I. since the building of the wooden boardwalk through the nesting habitat at Hellcat Swamp, and have not been seen at Lynnfield, their second stronghold, since at least 1976. Observers are urged to use extreme caution in identifying large rallids on the basis of vocalizations, as King and Virginia Rails utter at times virtually identical calls (much more similar than any field guide recording would lead one to believe). Those who make little of the difficulties involved need only be reminded of the "kicker" call, a vocalization uttered by the Virginia Rail, and

most likely other species, which led many outstanding ornithologists astray for some 50 years. It would be most unfortunate, and perhaps acutely embarrassing, if the King Rail would disappear from before our eyes as a local breeder with no one being the wiser. Most bizarre of all the early migrants was a Black Rail picked up dead on Nantucket March 31 (Bruce Bartlett, specimen to EFA). Two of the firmly established Nantucket American Oystercatchers arrived there on the unprecedentedly early date of March 24 (GF#). At Monomoy, 14 oystercatchers were present throughout May (v.o.), while two at Plymouth Beach May 20 (WRP) and 2 at Nauset throughout May (v.o.) may have been prospecting for future nesting sites. One hundred Semipalmated Plovers at Newburyport May 14 (MFC, BAZ#) represented the only peak count for that species, and 55 Killdeers in the Newburyport-P.I. area March 23 (RSH) was inconsistent with the general arrival noted throughout the state. Reports of three Golden Plovers were received, none accompanied by details definitively eliminating Greater Golden Plover, a species whose occasional occurrence in Massachusetts must be suspected. They were: one at Scituate April 19 (GRF) and singles at P.I. May 6 and 23 (SG, DTG). The Eurasian Curlew discovered in February on Menemsha Pond, Martha's Vineyard, was last seen by HLJ on March 18. Three species of shorebird arrived remarkably early: a Lesser Yellowlegs at Newburyport March 12-25 constituted the earliest record as did a Pectoral Sandpiper at Newburyport the same day (WRP#). Finally, a Short-billed Dowitcher was found at P.I. March 23 (RSH, MJK). Two alternate plumaged Long-billed Dowitchers at the P.I. basin April 15-23 (WRP#) raised eyebrows and suggested the possibility of last winter's birds returning. Although unprecedented in Massachusetts, April Long-billed Dowitchers have occurred in Maine on at least two separate occasions, including one bird at Mt. Desert Island this year. Two Reeves and 1-2 male Ruffs occurred in Newburyport Harbor April 29-May 12 (SAP, RAF, Bonnie Gard+#) and an alternate plumaged Curlew Sandpiper was there May 18-20 (AAC#). Note in particular the high counts of White-rumped Sandpipers this spring at Newburyport and Monomoy, eclipsing all previous spring totals in Massachusetts.

Black-bellied Plover:

May 12, 14, 21	Newburyport	380, 1200 [±] , 4000	RRV, SAP
May 28	Newburyport, Monomoy	2500, 1500	HLM, WRP#

Ruddy Turnstone:

May 14, 17;18	Newburyport, Squantum; 6, 10; 1		RRV, CJ; HLM
	<u>Bolton</u>		
May 20, 28	Thompson's Is., Monomoy	35, 400	JM, WRP

American Woodcock:

May 14	South Carver	f. with young	KSA
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Common Snipe:

April 9, 11	Newburyport, Concord	33, 32	RSH, RAF
April 1, 2, 12	Marshfield, Lancaster, Bolton	30, 20, <u>127</u>	WRP, NEM, BB
May 18 on	Whitman	"pr. prob. nesting"	WRP

Whimbrel:

April 21-25	Chatham	7	BN#
May 7-23	4 localities (3 Cape Cod)	4 indiv.	v.o.

Upland Sandpiper:

April 17 on, 22-24	Marshfield, Nantucket	3-6, 2-3	BAL#, SAP
May 10, 12	Duxbury, Eastham	6, 2	JWL#, RAF
May 16-20	Lancaster	1	HLM

Solitary Sandpiper:

April 13-May 21	8 localities	17 indiv.	v.o.
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Willet:

May 14, 20	Squantum, Plymouth; Squantum	1, 1; 1	SZ, WRP; SZ
May 21-28, 27-29	Newburyport, M.V.	3, 1	GWG, JFK#

Greater Yellowlegs:

April 29, May 12, 13, 14	Newburyport	80, 140, 175, 175	RRV#
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Lesser Yellowlegs:

April 29	Truro, Newburyport	1;15	BN, CAG; RRV#
May 12, 13; 30	Newburyport; Salisbury	10, 4; 1	RRV#

Red Knot:

May 12, 13, 14	Newburyport	30, 15, 10	RRV#
May 28, 29	Monomoy, Scituate	1 (low!), 4	WRP

Purple Sandpiper:

May 13, 14	Lynn, P.I.	300, 30	RHS, RRV
May 23	P.I.	6	JM

Pectoral Sandpiper:

April 9, 15	Newburyport, Bolton	56, 13	PMR, HLM
May 7	Essex, Eastham	3, 12	MA, SZ

White-rumped Sandpiper:

May 7; 12, 14	P.I.; Newburyport	7; 150, 250	WRP#; RRV, RSH#
May 11; 28	Monomoy	150+; 30	BN, CAG; WRP

Least Sandpiper:

April 29-30; May 12, 14	Newburyport	1; 2000, 2500	GWG; RRV
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Northern Phalarope cont.:

May 16, 18	Rockport; Nahant	500+; 2000	GLS; RSH, MJK
May 19	Boylston	1	HLM

JAEGERS THROUGH ALCIDS

Two Parasitic Jaegers were seen from Monomoy May 14 (RAF, ICTN), and 9 were seen the same day from S.N. (RFP), while a single Pomarine was reported from Nantucket May 17 (Chester Faunce fide EFA). Six Glaucous Gulls were at P.I. March 21 (JG), where one 2nd-year bird remained until at least April 22 (WRP#). Iceland Gulls numbered 38 at Gloucester March 21 (LC), 50+ at Newburyport March 12 (WRP), 30 were there throughout April (v.o.), and two immatures remained at P.I. until at least May 24 (RRV#). An adult Lesser Black-backed Gull was found at Nantucket April 22 (SAP) for the second island record. Ring-billed Gulls in Newburyport Harbor numbered 400 March 12 and 800 March 25 (WRP), and Black-headed Gull reports included 2-3 in Newburyport Harbor throughout March (v.o.), one adult at Falmouth April 15 (MBO staff), an adult at Newburyport May 14 (BAL#), and a sub-adult at Monomoy May 28 (WRP). An immature Laughing Gull at the Hyannis Airport March 17 (VL) may well have been an undetected winterer, but 5 adults at Chatham March 30 were clearly early arrivals (HCR). Fifty Laughing Gulls were at Nahant May 27 (BEC-WF), and four additional migrants occurred along the outer coast May 13-20 between Newburyport and Boston. Little Gulls included two at Newburyport March 18-28 (v.o.), building up to a maximum of 8 adults there May 7 (RRV) with apparently no further influx later in May, one at Provincetown April 23 (MBO staff) and an immature at Monomoy May 11 (BN, CAG). An adult Sabine's Gull was seen from Sandy Neck during the NE storm May 15 (RFP). As has been the case for the last three years, 40 Black-legged Kittiwakes, predominantly sub-adults, were noted on the flats at Monomoy throughout May (v.o.); storm-blown migrants included 275 at Rockport May 15 (RHS). Terns at Monomoy numbered 1500 Common and 500 Roseate May 14 (RAF + ICTN), and 500 Commons with 300 Roseates comprised the breeding population at Bird Island, Marion, May 13 (RAF, ICTN). In addition, 8 Arctic Terns were seen at Monomoy May 28 (WRP). Twenty Common Terns were noted from Boylston on May 17 and 6-8 Roseate Terns were noted there--this being the 3rd Worcester County record. A Forster's Tern was at Chatham March 30 (BN, HCR), this being the third consecutive early spring Forster's Tern to appear; the 1976 and 1977 individuals were both in Newburyport Harbor. A Caspian Tern was at Newburyport April 22 (WRP#), one was at N. Scituate April 28 (RSH) and a third was at Newburyport May 13 (RRV#). Six wintering Black Guillemots were still at Provincetown March 11 (BN), and stragglers included one at N. Scituate May 6 (WRP) and one at P.I. May 17 (GLS). Single Common Murres appeared at Provincetown April 1 (BN, CAG) and at Nantucket in the "end of May" (EFA). Surprising were 7 Thick-billed Murres reported near Stellwagen Bank April 17 (R. Prescott). Single Black Terns were at Marion May 13 and Monomoy May 14 (RAF, ICTN).

CUCKOOS THROUGH WOODPECKERS

Yellow-billed Cuckoo:

May 7-31	9 localities	12 indiv.	v.o.
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Black-billed Cuckoo:

May 7-31	10 localities	16 indiv.	v.o.
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Only rarely discovered nesting due to their elusive and retiring nature, two Long-eared Owls were found at their nest once again in Barnstable where they were present throughout March (RFP). Furthermore, the four seen at Martha's Vineyard May 27-29 strongly suggest a nesting pair with 2 young (JFK#),

Barn Owl:				
3/18-5/29	Martha's Vineyard	1		v.o.,
Great Horned Owl:				
4/17,5/7	Saugus,Peabody	2ad.& 2yg.,		CJ,RSH
		1 ad.& 2 downies		
5/14	Melrose	1 yg.		CJ,SZ
Snowy Owl:				
3/23,25	P.I.,Squantum	1,1		MJK#,EAM
Barred Owl:				
thr.Mar.,4/18	Boston,E.Middleboro	1,1		v.o.,KSA
4/27,5/8	Boxford,Boston	2 prs.on nests,1		RAF,HC#
Long-eared Owl:				
3/1-21,thr.Mar.	E.Lexington,Barnstable	2,2		JMA,RFP
3/18,21	Martha's Vineyard,Marblehead	1 decd., 1		HLJ#,MJK
				staff,HW
4/12,5/7	MBO,Manchester	1b.,1		JFK#
5/27-29	Martha's Vineyard	4		
Short-eared Owl:				
thr.Mar.,3/25	Bridgewater,P.I.	4,3		v.o.,BBC-WVC
4/11-12,13	N.Scituate	1,1		PT,GRF
5/27-29	Martha's Vineyard	1		JFK#
Saw-whet Owl:				
thr.Mar.	Eastham,Brewster,Barnstable	2-3,2,1		BN
4/8,12	MNWS	1		CB#
5/7	Rockport,Truro	1b.,1		ON,SZ#
Whip-poor-will:				
4/18	Eastham	1		CAG

Virtually inexplicable was the occurrence of an as of yet unidentified Selasphorus hummingbird in Newton April 15-17 (Alison McGowan). The observer, and owner of the yard in which it fed, was quite unfamiliar with the bird, but took several excellent photographs, from which a specific identification should be readily forthcoming. The bird is either a Rufous or an Allen's Hummingbird, the range of the former favoring it as the most likely of the two to occur in the east. The first Ruby-throated Hummingbird reported was in Mt.Auburn Cemetery April 28 (JG); peak numbers were noted late in the month with 14 and 10 in Mt.Auburn on May 22 and 23, respectively (RHS).

Pileated Woodpecker:

Mar.		5 individuals reported
Apr.	10 localities	11 individuals
May	7 localities	8 individuals

Red-bellied Woodpecker:

5/6,17	Natick	m. & f. on nest, usurped by Starlings	EWT
5/24-26	Eastham	1	Bartlett's fide BN

Red-headed Woodpecker:			
thr, Mar., 12-31	Gloucester, Weston	1, 1	v, o, LJR
3/25, thr, Apr,	Woburn	1, 2	GWG & v, o,
5/3, 7, 14	Gloucester, Woburn, P.I.	1, 1, lad,	JMacD, GWG, HLM
5/12, 20	S, Easton, Lynnfield	lad, , lad,	Trish Horwart, BK#
Yellow-bellied Sapsucker:			
3/18	Martha's Vineyard	1	B. Klunk#
4/12-5/3	11 localities	15 individuals	v, o,
<u>Black-backed Three-toed Woodpecker:</u>			
3/13	Dennis	1	H&D Baines

PASSERINES

The 1978 migration is perhaps best exemplified by the results obtained by the Manomet Bird Observatory; they banded a total of 2,098 birds of 96 species - fully 33% below the total for the same period in 1977. More or less pronounced wave-days occurred on May 5-6, 12-13, and 19-20, but the number of birds present at a given locality on each of those days, with the exception of the 20th, was decidedly below average. Overshooting warblers of a southern affinity were notably absent -- no Kentucky Warblers were observed, and the only Cerulean, as well as both of the Yellow-throated Warblers, occurred peculiarly during the very last days of May. Yet other southern vagrants, such as Blue Grosbeak and Summer Tanager, which typically occur earlier in the season, were recorded in near-normal numbers and at a typical season. Furthermore, a pronounced incursion of locally-breeding, later migrating species such as Indigo Bunting and Rose-breasted Grosbeak was obvious in the latter two weeks of April. The overall implication, if one may be extracted from such a seemingly voluminous assortment of records, is that meteorological conditions in late March and late April were particularly conducive to inciting migrating passerines in the southeastern United States to embark upon their flights and to continue moving north, whereas in May, they were not. Most species tended to either trickle through in small numbers throughout their typical migrating period, or bypass our region altogether.

FLYCATCHERS THROUGH THRUSHES

A Scissor-tailed Flycatcher appeared for one day only in Rochester May 3 (Jane Stair#). MBO banded 7 Acadian Flycatchers May 20-June 5, and one other was seen and heard at P.I. May 21 (PMR). There seems little room for doubt that this species will become firmly established as a breeder on the coastal plain within the foreseeable future. The distribution of Willow and Alder Flycatchers within the state continues to perplex, with few if any consistent patterns coming to light. Habitat separation does not seem sufficient as an isolating mechanism locally, unless more rigorous habitat analysis has more to reveal. Willows were recorded at GMNWR, Lynnfield, Milton, W. Newbury, Ipswich, and Newburyport May 20-31, while Alders were recorded from Ashburnham, W. Newbury, Lexington, Belmont and Cambridge May 27-31. Note the early Purple Martins on Cape Cod. Two separate Fish Crow nests were located in Mt. Auburn Cemetery during April and May (RAF, RSH). As wild food crops dwindled towards the end of the winter, previously undetected Varied Thrushes began appearing at feeders including one at Ayer throughout March until April 3 (Robin Yates#), one at Melrose throughout March (from Dec.) (JA#), one at Bridgewater Mar. 1-19

(Mrs,McGlarnery #), one female at Swampscott March 4 (THA), one at Yarmouth-port April 1-2 (fide RAF), Reading April 2-4 (Edward Finnerty), 1 male at Berkely April 3 (F.Sweeney), Avon April 1-18 (M.Gormley) and Framingham April 13 (S.Tully), Hylocichla thrushes were generally scarce, or undetected. Following is a selective enumeration of the records:

Great Crested Flycatcher:

5/11	Dover,Newburyport	1,1	FRH,RPE
Yellow-bellied Flycatcher:			
5/21,23,27	P.I.,Mt,Auburn,P.I.	4,1,1	RHS, v.o.
Acadian Flycatcher:			
5/20-6/5	MBO	7b.	Staff
5/21	P.I.	1	PMR
Least Flycatcher: (entire reports)			
5/9,10	Mt.Auburn	1,2	RHS,ESo
5/14,16	Middlesex Fells,Boxford	1,4	GWG,RHS#
Eastern Wood Pewee:			
5/21,23	Scituate,E.Middleboro	1,1	SSBC-RL,KSA
5/26-27	bulk of migrants		
Olive-sided Flycatcher:			
5/20-27	5 localities	5-6 reported	v.o.
Horned Lark:			
3/23	Newburyport-P.I.-Salisbury	125	RSH,MJK
Tree Swallow:			
3/19,22,23	Eastham,Chatham,P.I.	1,1,2	PWC,SAP,RSH
Purple Martin:			
3/22,26	Chatham,Centreville	1,1	SAP,VL
5/15	Clinton 1(rare in Worc.County)		HLM
Bank Swallow:			
4/16,17	W.Newbury,Wayland	1,1	RRV#,RAF
4/17,22	Westport,Concord	1,5	RRV#,RAF
5/14	Clinton	200	HLM
Rough-winged Swallow:			
4/13,15	Halifax,W.Newbury	2,1	WRP,WRP
4/17,21	Wayland,P.I.	2,4	RAF,RMB
Barn Swallow:			
4/12		general arrival	
Cliff Swallow:			
4/11	Lynnfield	1	NC
5/12,13	Ipswich,P.I.	2 prs.nest-building,5	JWB,RPE
5/27	Eastham,P.I.	1, "nesting colony"	WRP,PMR
Fish Crow:			
3/11,12	A.A.,Weston	4,4	RPD,LJR
4/10	Plymouth	6 (1 w/nesting mat'l)	staff
thr.Apr.,5/1-22	Mt.Auburn	1 nest,1 nest(seprte)	RHS,RAF
5/10,14,20	Abington,Jamaica Plain,Hanover	2,1-2,6	WRP,CJ#,WRP
Common Crow:			
5/11	W.Roxbury	1692	RMB
Boreal Chickadee:			
4/2;29	W.Boylston;N.Scituate,Boxford	1,1,1	NEM#;WRP#,HTW#
5/3	Rockport	1b.	ON

Red-breasted Nuthatch:			
thr. Apr.	Mt. Auburn	pr. building nest	MJL#
5/29	Lakeville	pr. nesting	WRP
Brown Creeper:			
Mar,	birds on territory by end of month		
May	11 localities	12 individuals	v.o.
House Wren:			
4/19,21	Lexington, Winchester	1,1	MJL, GWG
4/28,29	Middlesex, Lancaster	1,1	NBK, HLM
Winter Wren:			
4/12;13	Wayland; P.I., Salem	1;1,1	DL; JJC, RSH
4/13-14,16	MNWS, P.I.	1-2,1	MJK, PMR
5/1	P.I.	1	MLB, DB
Carolina Wren:			
4/9,17	Whitman, Westport	1,3	SH, RRV#
5/6,27-29	Westport, Martha's Vineyard	3,20	RHS, JFK#
Gray Catbird:			
3/8	Martha's Vineyard, Lexington	1,1	G&H Champoux, PS
Wood Thrush:			
5/7	Mt. Auburn, MNWS	1-2,1	OK, CB
5/10-12	general arrival on breeding localities		
Swainson's Thrush:			
5/20,23	Thompson's Is., Mt. Auburn	16,9	BBC-JM, RHS
5/20	Mt. Auburn, Dover	4,6	HHD'E, FRH
Gray-cheeked Thrush:			
5/20	Thompson's Is., Nahant, Dover	1,5,1	JM#, HTW#, FRH#
5/22-23,27	Mt. Auburn, Ashburnham	1,1	JB, RHS, HLM
Veery:			
5/7-8	first arrivals		
Eastern Bluebird:			
Mar.	4 localities	10 individuals	v.o.
Apr.	5 localities	12 individuals	v.o.

GNATCATCHERS THROUGH VIREOS

The multitude of Northern Shrikes lingering late into April this year amplified more than ever the difficulty in reviewing the reports of early spring Loggerhead Shrikes north of the southeast coastal plain. Of the five reports received, two were in Essex County, and none were accompanied by substantiated details or even acknowledgement of rarity. Please include details with reports of this rare and difficult to identify species.

Blue-gray Gnatcatcher:			
4/15-29	9 localities	20 individuals	v.o.
5/2-24	7 localities	15 individuals	v.o.
Golden-crowned Kinglet:			
4/1	MNWS	12 (maximum count)	CB
5/27	Mt. Watatic	5 (breeders?)	HLM
5/29	Lakeville	1-3 prs. on territory	WRP
Ruby-crowned Kinglet:			
4/13,16,25	P.I., Salem, MNWS	30,50,60	JJC, PW, CB
5/20	Newburyport	1	BBC-HW
Water Pipit:			
3/25,4/2	Provincetown, Lancaster	1,15	JG#, NEM#

4/12,17	Bolton,S.Dartmouth	11,1	HLM,DB
5/19,21	Framingham	2,1	RAF
Northern Shrike:			
Mar.-4/13	10 localities	17+individuals	v.o.
4/13	P.I.,	5	NBK#,MBO#
Loggerhead Shrike:			
3/25	Essex	1	PP
4/1+9,8	Wellfleet,Eastham	1+1,1	BN,CAG
4/9,5/3	P.I.,Wellfleet	1,1	R,Frescott,CAG
White-eyed Vireo:			
4/30,5/13	MNWS,Newburyport+P.I.,	1,1+2	CB,WRP#+RCH#
5/21,27	Marshfield,W.Newbury	1,1	SSBC-RL,GLS
5/30,31	Framingham,Ipswich	1,1	RAF & KSH,JWB
Yellow-throated Vireo:			
5/12,27	Mt.Auburn,P.I.,	1,2	BBC-JR,SJC#
5/28	Newton	1	MVS,Tenney Lehman
Solitary Vireo:			
4/25-5/12	7 localities	45 individuals	v.o.
5/11,12	Newburyport,Mt.Auburn	12,10	RPE,PMR
Philadelphia Vireo:			
5/20	P.I.,Newbury	2,1	BBC-HW,HLM

WARBLERS

The only parulid apparently arriving early due to the weather patterns affecting so many other species was a Northern Parula found dead at Westport April 1 (Linda Liddy). An adult male Townsend's Warbler was discovered in Mt.Auburn Cemetery May 4 (MR,CJ,SZ & v.o.), where it was subsequently seen by many and identifiably photographed in color. This is the first documented state record, the only others being a sight record from Naushon Island Nov.26,1927, and of a bird purportedly banded on Nantucket in September circa 1966. A remarkable four Orange-crowned Warblers were reported from the Newburyport area May 20 (HW#).

Black-and-white Warbler:			
4/29,30	Mt.Wachusett,E.Middleboro	1,3	IG#,KSA
4/30	Newbury,Plymouth	1,4	HLM,RHS
Worm-eating Warbler:			
5/10,13	Dover,P.I.	1,1	J.Hallowell,RPE
5/23-on	Weston	1	LJR,EWT#
Golden-winged Warbler:			
5/13-on,19-on	W.Newbury,Framingham & Ashland, Lancaster	1-4,1+1,1	RCH#,RAF#,HLM
5/20,25	Lynnfield,Dover	1,1	BK,FRH
5/29	Ipswich	1	BBC-IG
Blue-winged Warbler:			
5/12-21	5 localities	9+ migrants	v.o.
5/27-29,28	Martha's Vineyard,W,Newbury	12,9	JFK#,RSH+MK
"Brewster's Warbler":			
5/28	Framingham	1 m,	RAF
Tennessee Warbler:			
5/12-28	8 localities	18 individuals	v.o.
5/23	Mt.Auburn	35	RHS#

<u>Orange-crowned Warbler:</u>			
5/18,20	Mt.Auburn,P.I.	1,2	NW+RPE,PMR
5/20	Newburyport,Mt.Auburn	4,1	HJ#,RHS#
<u>Nashville Warbler:</u>			
5/6-20	8 localities	15 individuals	v.o.
5/9	Mt.Auburn	5	ES
<u>Northern Parula:</u>			
4/1,27-30	Westport,Mt.Auburn	1 dead,1	L,Liddy,P,Spencer#
<u>Yellow Warbler:</u>			
5/13,21	W.Newbury,Saugus	40,20	RSH,CJ
<u>Magnolia Warbler:</u>			
5/11-28	12 localities	50-55 individuals	v.o.
<u>Cape May Warbler:</u>			
5/10-23	4 localities	12 individuals	v.o.
<u>Black-throated Blue Warbler:</u>			
5/7-23	12 localities	28 individuals	v.o.
<u>Yellow-rumped Warbler:</u>			
4/17,30	Saugus,Mt.Auburn	20,40	CJ,CCM
5/8,12	Wayland,Mt.Auburn	75,50+	RAF,JR#
<u>Townsend's Warbler:</u>			
5/4	Mt.Auburn	1 ad.m.	MR,CJ,SZ,& v.o.
<u>Black-throated Green Warbler:</u>			
4/29-30	Boxford	1-2	RHS#
5/6-29	12 localities	48+ migrants	v.o.
<u>Cerulean Warbler:</u>			
5/27	Mt.Auburn,Lancaster	1,1	LJR+FRH#,HIM
<u>Blackburnian Warbler:</u>			
5/9-28	9 localities	21 migrants	v.o.
<u>Yellow-throated Warbler:</u>			
5/22,30	Mt.Auburn,MBO	1,1b.	LJR+EWT,staff
<u>Chestnut-sided Warbler:</u>			
5/9-28	9 localities	20 individuals	v.o.
<u>Bay-breasted Warbler:</u>			
5/13-27	7 localities	50+ individuals	v.o.
5/20,23	Mt.Auburn	10,30	RHS#
<u>Blackpoll Warbler:</u>			
5/11-on	16 localities	120+ individuals	v.o.
5/23,26	Mt.Auburn	35,20	RHS#
<u>Pine Warbler:</u>			
4/6-25	8 localities	28 migrants	v.o.
5/27-29	Martha's Vineyard	25	JFK#
<u>Prairie Warbler:</u>			
5/10,18,20	Sharon	adults,nest w/2 eggs, nest w/4 eggs	RMB
<u>Palm Warbler:</u>			
4/11-5/3	6 localities	105+ individuals	v.o.
5/10,20	Mt.Auburn,Milton	1,1	RMB,JO'R
<u>Ovenbird:</u>			
5/7-on		25 individuals	v.o.
<u>Northern Waterthrush:</u>			
4/23,29	MNWS,Milton	1,1	MJK,MJL
4/30	E.Middleboro,Fall River	3,1	KSA,SPG
5/6-25	20 localities	26 individuals	v.o.
<u>Louisiana Waterthrush:</u>			
4/17-on,23-24	Boxford,Brookline	3,1	GLS#,D.Arvidson#

4/25-31,29	Mt,Auburn,Lancaster	2,1	KN#,HLM
plus breeding pairs in Ashland,Milton,Framingham,Dover,Lancaster			
Mourning Warbler:			
5/21-31	6 localities	8 individuals	v.o.
Common Yellowthroat:			
5/9,13,21	Mt,Auburn,Milton,Saugus	3,16,40	RHS,RCV,CJ
Yellow-breasted Chat:			
5/13	Bolton	1	N,Sampson,fide HLM
5/18	Mt.Auburn	1	fide CJ
Hooded Warbler:			
4/22-30,5/11	MNWS,Mt.Auburn	1 m.,1 m.	CJB#,SD#
Wilson's Warbler:			
5/11-28	14 localities	24 individuals	v.o.
Canada Warbler:			
5/12-on	12 localities	38 individuals	v.o.
American Redstart:			
5/10-on		70 reported	v.o.
5/12,20	Mt.Auburn,Newburyport	12,17	PMR,HW#

BOBOLINK THROUGH TOWHEE

Four hundred migrant Bobolinks at Plum Island May 13 was an exceptional total (PMR) and 280 were also counted in Framingham May 19 (RAF). Spring Yellow-headed Blackbirds are a comparative novelty in Massachusetts; the three adult males this spring were: one at Newburyport April 10 (R.McHale), one at Melrose April 11-12 (Beverly Stewart), and one at Medford Apr.14-23 (Mary Kelley). Of 10 spring Yellow-headed Blackbirds in Massachusetts since 1973, 2 have been adult males, 2 females, and 6 unspecified, in comparison to the vast preponderance of immature males that occurs here in the fall.

Orchard Oriole:

5/7;11-20	Mt.Auburn,Waltham;Nantucket	1 im.m., 1 ad.m.; 1-2 im.m.	WRP,RHS;EFA.
5/13;19,22	Rowley;Woburn	1;1 im.m.,1 ad.m.	RCH#;GWG
5/20	Whitman,Nahant	1,1	WRP,BK
5/27-29,28	Martha's Vineyard,Chatham	1,3(1 im.m.,2 f.)	JFK#,WRP#

The larger flocks of migrating Rusty Blackbirds were 20 in Lancaster March 26 (HLM), 32 at P.I. April 9 (PMR), 50 at Saugus April 9 (CJ), 45 at Lancaster April 14 (HLM), 50 at Provincetown April 30 (CAG), and 35 at Wayland May 4 (RAF). A male Brewer's Blackbird at Nantucket April 3 was surprising as to date (EFA#). Four male Summer Tanagers were noted: one at Wellfleet April 13 (fide WWB), one at Yarmouth in mid-April (fide WWB), one at Melrose and one at Nahant, both May 20 (JMA,HC#). From April 20-31 at least 7 Rose-breasted Grosbeaks were found on Cape Cod; additional records were one at Nahant April 22, one at Manomet April 29 (RRV#), and one at Plymouth April 30 (WRP). Blue Grosbeaks numbered 11 during the period April 14-May 11, all along the immediate coast from Gloucester to Cape Cod. Similarly, no less than 20 Indigo Buntings arrived on Cape Cod from April 13 on (fide BN); 8 others were scattered along the coast north to P.I. during the period April 20-28 (v.o.). An adult male Painted

Bunting was present at a feeder in Hyannis until at least March 5 (Mr. Mycock#). Dickcissels included one at the Hyannis feeder March 1-19 (Mycock#), one in Walpole April 23-26 (Stein), and one at Nahant which was present until May 1 (William Crawford). Evening Grosbeaks were noted migrating from mid-April through mid-May, with maxima of 115 at Framingham May 6-10 (RAF), 47 at Lexington May 7 (JMA), and 30 at Westwood May 2 (Mrs. Mawn). The May total for migrant Purple Finches was 75 from 8 localities, with none reported from Cape Cod, Pine Grosbeaks remaining into March included approximately 140 individuals from 14 localities (v.o.). One to three Hoary Redpolls were reportedly present at Beverly March 5-7 (GLS), and 2-3 in Hyannis March 11 (JJC), although, remarkably, neither included substantiating details. Observers are urged to exercise particular caution in identifying this species. As the degree of hybridization between Hoary and Common Redpolls in their region of sympatry is high, intermediate individuals are frequent. Although a "pure" Hoary Redpoll is quite unmistakable upon close examination, other individuals not so strikingly marked quite muddle the picture.

Common Redpoll:

thr.Mar.	Woburn	100	GWG
3/2,7	DFWS,Beverly	105,20	RAF,GLS
3/16,4/14	Stoneham	140,100	MM,MM
4/19	Woburn	30	MM

Of the hundreds of Pine Siskins present through mid-April and the stragglers into May, 4 nests were found in Waltham and 3 in Cambridge April 9 (RHS), and a pair with 3 young was noted in Middleboro May 14 (KSA). Similarly, Red Crossbills persisted late into the season, and a flock of up to 12 birds in Framingham throughout May (RAF), and 2 birds, including a singing adult male, at P.I. May 24 (RRV#), were each suspected of breeding, although this supposition could never be proved. The largest single flock was of 50 in Lynn April 1 (RSH). White-winged Crossbills were noted from Mt.Auburn on April 9 and 23 (TMV). Rufous-sided Towhees arrived almost two weeks behind schedule on their nesting grounds in Middleboro on May 8 (KSA), but a general arrival of migrants was noted elsewhere April 17-30.

SPARROWS THROUGH SNOW BUNTING

Migrant Fox Sparrows were particularly numerous as spring migrants following a meager fall flight and winter populations, whereas Lincoln's Sparrows were particularly scarce, reflecting a pattern exhibited by many northerly breeding passerines in May.

Savannah (Ipswich) Sparrow:

3/25 P.I. 1 WRP#

Grasshopper Sparrow:

5/27,27-29 Truro,Martha's Vineyard 1,10 WRP,JFK#

Sharp-tailed Sparrow:

5/14 Monomoy 1 RAF,ICTN

Vesper Sparrow:

3/21 Newburyport 1 JG#
 4/11-on;4/16 P.I.;Framingham 2-6;3 NC#;RAF,KSH
 4/17,18 Westport,Cambridge 4,1 RRV,FB

4/15,22	Woburn,S.Wellfleet	1,10	GWG,HHD!E
4/23,29	Marshfield,Lancaster	1,2	MFL,HLM
<u>Lark Sparrow:</u>			
until 4/16	Needham	1 at feeder	D.Hottle
<u>Tree Sparrow:</u>			
4/22,27	MNWS,Wayland	1,1	MJK,RAF
5/9,10,17	Medfield (well described)	2,2,1	RMB
<u>Chipping Sparrow:</u>			
3/18	Sandwich	1 (probable winterer)	RFP
3/13; 4/17,18	Lynn;Sudbury,S.Wayland	1;1,3	RSH; RAF
<u>Dark-eyed Junco:</u>			
5/10	Mt.Auburn	2	BBC-E,Soja
<u>White-crowned Sparrow:</u>			
thr.Apr.-5/7	Danvers	2	E.Pyburn
5/26,27	Stoneham	1,2	MM
5/11-23	10 localities	14 individuals	v.o.
<u>Fox Sparrow:</u>			
4/1	S.Peabody,Norwell	12,8b.	RSH,BAL+MFL
4/4,10	Stoneham,MBO	20,10+	MM,staff
4/13,20	Mt.Auburn,MNWS	40,1	LT,RSH
5/4	Mt.Auburn	1	D.Arvidson
<u>Lincoln's Sparrow:</u>			
5/14,20	Boxford,Manchester	1,2	SSBC-BAL,G.Hotz#
5/20	P.I.,Boxford	1,1	IG,A.Scott
5/24	P.I.	1	RRV#
<u>Lapland Longspur:</u>			
3/11,18	Spencer,P.I.	30,200	D.Dineen,IG
4/1,15	P.I.,Salisbury	50,26	BBC-Sid Wilson, DD+DB
<u>Snow Bunting:</u>			
3/13	P.I.	160	RMB
4/9	P.I.	20	PMR

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TIDE CHART

Here is the tide table for Boston Harbor; add one hour for Daylight Savings Time.

1978 AUGUST TIDES 1978

Morning	BOSTON	Afternoon	Morning	BOSTON	Afternoon
High 5.49 Low 11.58 Sunset 4.48	13	High 6.16 Height 10.2 Sunset 6.49	High 6.09 Height 11.9 Sunset 4.56	20	High 12.24 Height 11.1 Low 6.30 Height -1.5 Sunset 6.38
High 6.49 Low 12.41 Sunset 4.48	14	High 7.15 Height 10.5 Sunset 6.48	High 12.47 Height 11.4 Low 6.58 Height -1.6 Sunset 4.37	21	High 1.14 Height 11.1 Low 7.22 Height -1.3 Sunset 6.37
High 7.52 Low 1.42 Sunset 4.50	15	High 8.14 Height 10.9 Sunset 6.46	High 1.38 Height 10.9 Low -1.1 Height 4.58	22	High 2.04 Height 10.8 Low 8.15 Height -0.9 Sunset 6.35
High 8.50 Low 2.40 Sunset 4.51	16	High 9.13 Height 10.8 Sunset 6.44	High 2.30 Height 10.4 Low 8.35 Height -0.5 Sunset 4.59	23	High 2.54 Height 10.4 Low 9.08 Height -0.3 Sunset 6.34
High 9.48 Low 3.36 Sunset 4.52	17	High 10.09 Height 11.7 Sunset 6.43	High 3.22 Height 9.6 Low 9.28 Height 0.1 Sunset 4.57	24	High 3.47 Height 10.0 Low 10.03 Height 0.2 Sunset 6.32
High 10.42 Low 4.28 Sunset 4.51	18	High 11.02 Height 11.8 Sunset 6.41	High 4.17 Height 9.0 Low 10.22 Height 0.1 Sunset 4.51	25	High 4.40 Height 9.5 Low 10.59 Height 0.2 Sunset 6.30
High 11.34 Low 5.20 Sunset 4.52	19	High 11.55 Height 11.5 Sunset 6.39	High 5.13 Height 8.5 Low 11.17 Height 0.1 Sunset 4.49	26	High 5.38 Height 8.9 Low 11.59 Height 0.9 Sunset 6.29

1978 AUG. - SEPT. TIDES 1978

Morning	BOSTON	Afternoon	Morning	BOSTON	Afternoon
High 6.13 Low 12.57 Sunset 5.03	27	High 6.35 Height 9.1 Low 12.15 Height 1.4 Sunset 6.27	High 11.33 Height 9.6 Low 5.23 Height -0.3 Sunset 5.17	3	High 11.49 Height 10.1 Low 5.39 Height -0.1 Sunset 6.13
High 7.12 Low 12.57 Sunset 5.04	28	High 7.29 Height 9.1 Low 1.11 Height -0.4 Sunset 6.26	High 12.28 Height 10.0 Low 6.00 Height 0.3 Sunset 5.12	4	High 12.10 Height 9.8 Low 6.19 Height -0.3 Sunset 6.12
High 8.04 Low 1.42 Sunset 5.08	29	High 8.21 Height 9.3 Low 2.03 Height 1.2 Sunset 6.22	High 12.28 Height 10.0 Low 6.39 Height -0.2 Sunset 5.10	5	High 12.49 Height 10.0 Low 7.00 Height -0.3 Sunset 6.10
High 8.55 Low 2.40 Sunset 5.07	30	High 9.07 Height 9.5 Low 2.53 Height 1.0 Sunset 6.21	High 1.10 Height 9.9 Low 7.19 Height -0.3 Sunset 5.15	6	High 1.29 Height 10.1 Low 7.43 Height -0.2 Sunset 6.05
High 9.36 Low 3.24 Sunset 5.07	31	High 9.51 Height 9.7 Low 3.36 Height 0.7 Sunset 6.19	High 1.53 Height 10.1 Low 8.01 Height 0.0 Sunset 5.12	7	High 2.14 Height 10.1 Low 8.30 Height -0.2 Sunset 6.04
High 10.17 Low 4.05 Sunset 5.10	1	High 10.31 Height 9.9 Low 4.18 Height 0.4 Sunset 6.17	High 2.40 Height 9.5 Low 8.48 Height 0.2 Sunset 5.11	8	High 3.01 Height 10.2 Low 9.21 Height -0.1 Sunset 6.03
High 10.56 Low 4.44 Sunset 5.11	2	High 11.10 Height 10.5 Low 5.00 Height 0.1 Sunset 6.15	High 3.33 Height 9.3 Low 9.39 Height 0.4 Sunset 5.10	9	High 3.54 Height 10.0 Low 10.19 Height 0.0 Sunset 6.02

1978 SEPTEMBER TIDES 1978

Morning	BOSTON	Afternoon	Morning	BOSTON	Afternoon
High 4.29 Low 10.37 Sunset 5.19	10	High 4.53 Height 10.2 Low 11.19 Height 0.0 Sunset 4.07	High 11.13 Height 11.2 Low 4.58 Height -1.6 Sunset 5.28	17	High 11.38 Height 11.2 Low 5.22 Height -1.6 Sunset 5.47
High 5.29 Low 11.36 Sunset 5.21	11	High 5.54 Height 10.1 Low 12.01 Height 0.1 Sunset 5.19	High 12.00 Height 11.2 Low 6.10 Height -1.5 Sunset 5.47	18	High 12.00 Height 11.2 Low 6.10 Height -1.5 Sunset 5.47
High 6.33 Low 12.21 Sunset 5.22	12	High 6.57 Height 10.3 Low 12.42 Height 0.4 Sunset 5.36	High 12.26 Height 11.2 Low 6.32 Height -1.2 Sunset 5.39	19	High 12.47 Height 11.1 Low 6.59 Height -1.3 Sunset 5.45
High 7.36 Low 1.23 Sunset 5.23	13	High 8.00 Height 10.7 Low 1.44 Height 0.0 Sunset 5.34	High 1.14 Height 10.5 Low 7.19 Height -0.7 Sunset 5.30	20	High 1.32 Height 10.7 Low 7.47 Height -0.9 Sunset 5.44
High 8.35 Low 2.21 Sunset 5.24	14	High 8.58 Height 11.0 Low 2.42 Height 0.5 Sunset 5.32	High 2.01 Height 9.6 Low 8.05 Height -0.1 Sunset 5.31	21	High 2.23 Height 10.3 Low 8.37 Height -0.3 Sunset 5.42
High 9.30 Low 3.17 Sunset 5.25	15	High 9.54 Height 11.3 Low 3.38 Height -1.0 Sunset 5.31	High 2.52 Height 9.3 Low 8.54 Height 0.3 Sunset 5.32	22	High 3.10 Height 9.8 Low 9.29 Height 0.2 Sunset 5.39
High 10.23 Low 4.09 Sunset 5.27	16	High 10.47 Height 11.4 Low 4.31 Height 0.4 Sunset 5.47	High 3.43 Height 8.8 Low 9.45 Height 0.4 Sunset 5.32	23	High 4.03 Height 9.3 Low 10.22 Height 0.7 Sunset 5.39

1978 SEPT. - OCT. TIDES 1978

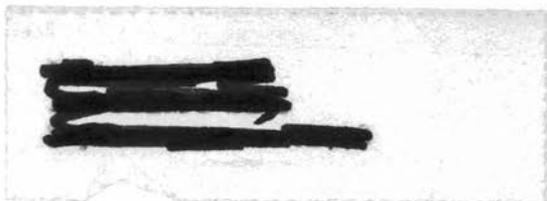
Morning	BOSTON	Afternoon	Morning	BOSTON	Afternoon
High 4.38 Low 10.40 Sunset 5.24	24	High 4.57 Height 9.0 Low 11.19 Height 1.0 Sunset 5.27	High 10.21 Height 9.8 Low 4.12 Height -0.1 Sunset 5.42	1	High 10.40 Height 9.9 Low 4.31 Height -0.2 Sunset 5.24
High 5.34 Low 11.38 Sunset 5.24	25	High 5.54 Height 8.8 Low 12.01 Height 0.1 Sunset 5.36	High 11.00 Height 10.1 Low 4.49 Height -0.3 Sunset 5.42	2	High 11.21 Height 10.0 Low 5.12 Height -0.6 Sunset 5.24
High 6.31 Low 12.15 Sunset 5.26	26	High 6.51 Height 8.8 Low 12.34 Height 1.8 Sunset 5.34	High 11.39 Height 10.4 Low 5.30 Height -0.4 Sunset 5.43	3	High 11.39 Height 10.4 Low 5.54 Height -0.8 Sunset 5.23
High 7.25 Low 1.17 Sunset 5.26	27	High 7.43 Height 9.0 Low 1.29 Height 1.4 Sunset 5.32	High 12.03 Height 10.1 Low 6.10 Height -0.4 Sunset 5.44	4	High 12.19 Height 10.6 Low 6.35 Height -0.9 Sunset 5.20
High 8.16 Low 2.02 Sunset 5.28	28	High 8.31 Height 9.2 Low 2.19 Height 1.0 Sunset 5.30	High 12.45 Height 10.0 Low 6.53 Height -0.3 Sunset 5.45	5	High 13.03 Height 10.6 Low 7.21 Height -0.8 Sunset 5.20
High 9.01 Low 2.47 Sunset 5.29	29	High 9.17 Height 9.5 Low 3.06 Height 0.6 Sunset 5.28	High 1.30 Height 9.8 Low 7.35 Height -0.2 Sunset 5.46	6	High 1.49 Height 10.6 Low 8.08 Height -0.8 Sunset 5.18
High 9.40 Low 3.30 Sunset 5.40	30	High 9.59 Height 9.7 Low 3.49 Height 0.2 Sunset 5.32	High 2.21 Height 9.6 Low 8.26 Height 0.1 Sunset 5.47	7	High 2.38 Height 10.4 Low 9.00 Height -0.9 Sunset 5.16

Tidal differences from Boston High Tide

- Newburyport 31 minutes later
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- Plymouth 5 minutes later
- Chatham (outside) 30 minutes later
- (inside) (1 hr) 54 minutes later
- New Bedford (3 hrs) 15 minutes earlier

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