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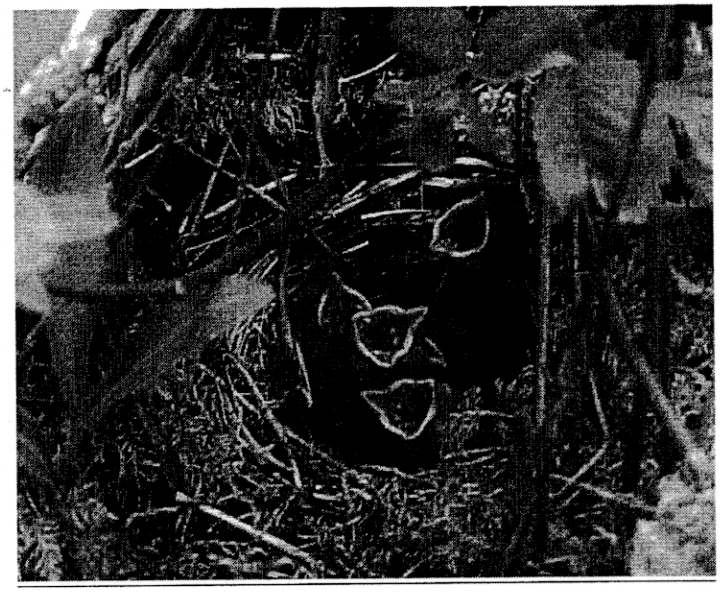
A PROGRESS REPORT:

LANDBIRD BREEDING AND FALL MIGRATION MONITORING AT MOTHER GOOSE LAKE ALASKA PENINSULA NATIONAL WILDLIFE REFUGE, ALASKA JUNE-SEPTEMBER 2000



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ABSTRACT

We studied landbirds at Mother Goose Lake on the Alaska Peninsula/Becharof National Wildlife Refuge Complex (NWRC) for the seventh consecutive year (1994-2000). We used constant-effort mist netting to examine the status of breeding and migrating landbirds; the results contribute to the Monitoring Avian Productivity and Survivorship (MAPS) program and statewide migration monitoring efforts. We banded 4811 landbirds of 21 species during the breeding season and fall migration. Breeding season and fall migration densities of Wilson's warblers (*Wilsonia pusilla*) continue to be the highest among the landbird species captured at Mother Goose Lake. This year our highest number of captures, and our highest capture rate, occurred on August 12. We ended the day with 450 total captures in 30.5 net hours, giving us a capture rate of 1475.4 birds per 100 net hours. During MAPS banding (June 10 – August 4) 139 birds returned from previous years, while six birds returned during migration banding (August 5 – September 13). This season we also increased our effort to find and monitor nesting landbirds. A total of 96 nests of 14 species were located and monitored throughout the season.

INTRODUCTION

The establishment of long-term landbird monitoring programs is essential to identify and understand factors affecting their populations. Long-term monitoring efforts, primarily on the East Coast, have shown that many migrant landbirds have experienced a steady decline over the last 25 years (Robbins et al. 1989, Sauer and Droege 1989, Hagan et al. 1989). In Alaska, poor accessibility of remote populations has prevented long-term monitoring of landbirds throughout the state. Refuge management established the Mother Goose Lake field station (MOGO) in 1994 to contribute to the overall understanding of Alaskan landbird populations. The station is located approximately 160 km south of the Alaska Peninsula/Becharof NWRC headquarters in King Salmon, Alaska. The field station is a cooperative effort between the U.S. Fish and Wildlife Service (USFWS), the Institute for Bird Populations (IBP), and the Boreal Partners in Flight (BPIF) working group. In 1994, efforts involved two MAPS stations, point counts, nest searching, and migration banding. In 1995, a small mammal trapping study and another MAPS station were added. In 1996, color banding was initiated at the station. By 1997, MOGO was established as one of four clustered stations running for three or more years in Alaska. Since 1995 the three MAPS stations have remained constant and the program of nest searching, color banding, off-road point counts, small mammal trapping, gull colony monitoring, vegetation surveys, and migration banding has continued.

The MAPS program is composed of a network of constant-effort mist netting stations developed by the IBP with the first stations established in 1989 (Desante and Burton 1993). MAPS is a continent-wide project targeting the breeding populations of Neotropical migrant landbirds in North America. Since its inception, the MAPS project has seen impressive growth throughout the country and has come close to their goal of 20 stations in each region. North America is divided into eight regions; Alaska and the Yukon comprise one region. In 1997, Alaska maintained 25 MAPS stations throughout the state. Recently, the MAPS program has started to show signs of stabilizing across the

country. Many stations have met or exceeded the minimum five-year commitment and are now branching out to focus their efforts on other projects. In 2000 Alaska experienced this trend and has dropped from a high of 25 stations down to 15 stations statewide. Prior to the Mother Goose field project, few programs involving landbird banding had been conducted on the Alaska Peninsula (Bailey 1974a, Bailey 1974b, Dewhurst et al. 1995, Savage et al. 1988) and long-term projects had been non-existent. The information that has been collected at Mother Goose Lake will be invaluable in establishing baseline data for future comparisons of landbird populations throughout the Mother Goose region and across the entire Alaska Peninsula.

Objectives and Goals

Objectives of landbird monitoring on the Alaska Peninsula NWRC were developed to meet the continental goals of MAPS and to contribute to the regional goals of Boreal Partners in Flight (Desante and Burton 1993 and Handel 1994). Refuge objectives are:

1. to determine presence, relative abundance, and breeding status of landbird species on the Alaska Peninsula;
2. to examine post-fledging productivity and recruitment into the local landbird population;
3. to examine adult landbird survivorship and breeding site fidelity;
4. to document local habitat use by landbird species during breeding and migration;
5. to measure environmental and biological factors and assess their impact on landbird populations;
6. to collect natural history information on species where little exists for sub-arctic populations.

The continental MAPS program was established to: (1) determine annual changes and long-term trends in population and demographic parameters of the target species in each region: (2) relate these trends to climatic factors, habitat type, and management practice; and (3) develop and refine current population models. Target species for southwest Alaska were determined during the Boreal Partners in Flight geographic working group. A range of criteria including distribution, threats, and abundance was used to prioritize species. Target species that can be monitored at MOGO are gray-cheeked thrush (*Catharus minimus*), northern shrike (*Lanius excubitor*) and golden-crowned sparrow (*Zonotrichia atricapilla*). Other priority species (Western Working Group, Partners in Flight) that can be monitored include alder flycatcher (*Empidonax alnorum*), orange-crowned warbler (*Vermivora celata*), Wilson's warbler, American tree sparrow (*Spizella arborea*), Gambel's white-crowned sparrow (*Zonotrichia leucophrys*), and fox sparrow (*Passerella iliaca*).

STUDY AREA

Mother Goose Lake is located on the Alaska Peninsula in southwestern Alaska (Fig. 1). Located at 57° 11' N and 157° 15' W, the Mother Goose Lake watershed is unique on the peninsula because of the extensive cottonwood (*Populus balsamifera*) forest surrounding the lake. Millions of hectares of treeless tundra and shrub surround the lake and define

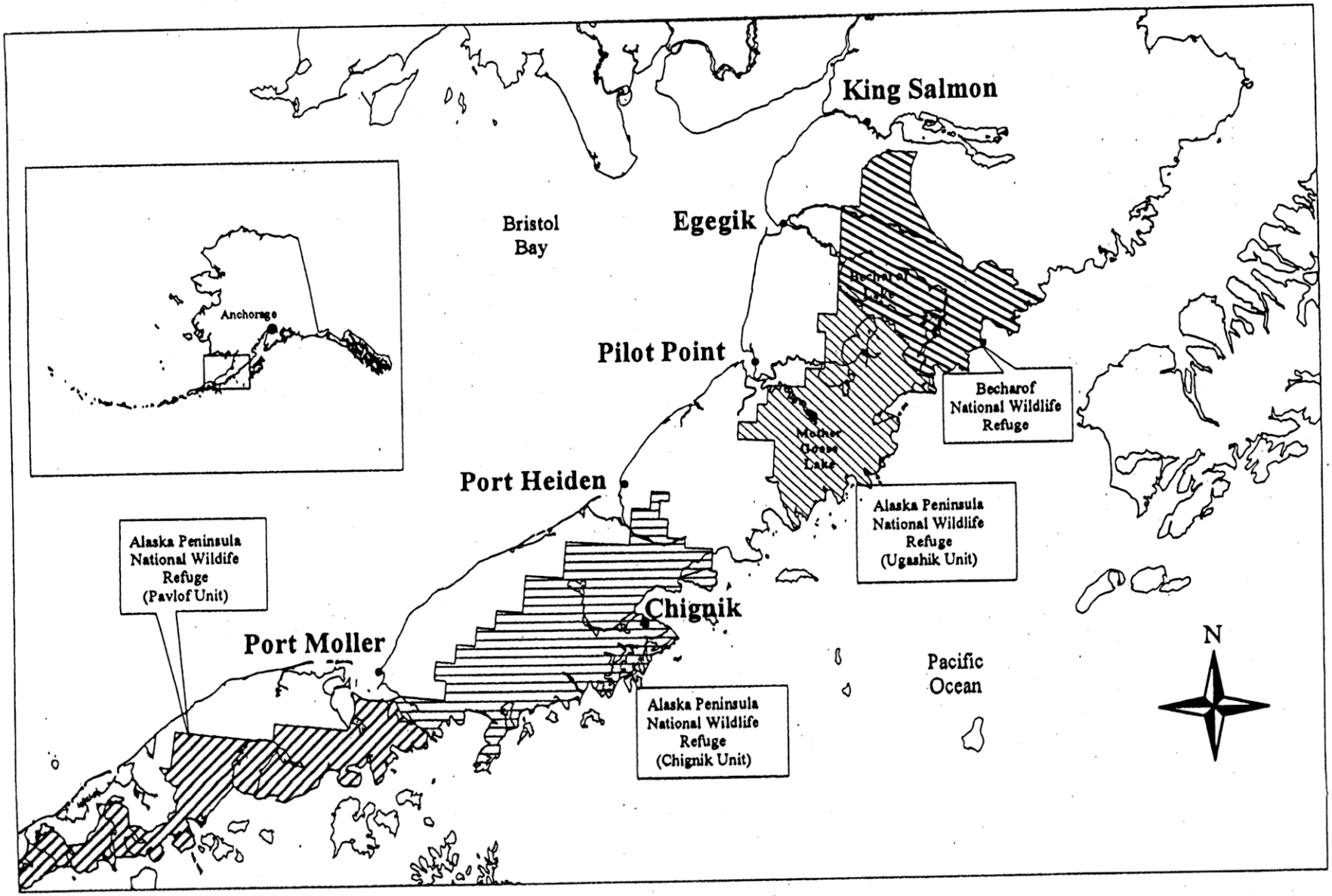

Figure 1. Location of Mother Goose Lake on the Alaska Peninsula National Wildlife Refuge.

the major habitat of the peninsula. The tundra is dominated by non-vascular plants (lichens and mosses), ericaceous plants, and grasses. A preliminary list of the vascular flora for the MOGO area is available in the Refuge Complex office. An open deciduous woodland of cottonwoods in the lowlands dominates the Mother Goose Lake basin with the major lake drainages (Volcano and Indecision creeks) bordered by large tracts of wet meadows. The mountain bases are vegetated with cottonwoods interspersed with willow (*Salix spp.*) and sitka alder (*Alnus crispa*) thickets and a variety of meadow types (wet, dwarf shrub, grassy, and tall forb) (Kessel 1979). Dwarf shrub mat dominates the surrounding mountain plateaus and seasonally exposed slopes.

Banding sites at Mother Goose Lake have been standardized to those of previous years and include the Lake, Mountain, and Cranberry Hill MAPS stations (also called sites; Dewhurst et al. 1995, Eskelin and Dewhurst 1996, Dewhurst et al. 1996, Moore et al. 1998). Migration banding is conducted at the Lake site. MAPS site habitat descriptions are given in Dewhurst et al. (1996).

METHODS

Weather

We collected data on several weather variables each morning consistent with previous years' methods (Moore et al. 1998). Weather collection began on June 9 and continued through September 14. Weather was usually taken between the hours of 0630 and 0800. In addition to daily weather collection, temperature, cloud cover, wind speed, precipitation, and ceiling height were recorded at the start and close of each day of MAPS and migration banding.

On June 30, 2000 a new Remote Access Weather Station (RAWS) was erected near the Mother Goose field site. The station is located in an open wet meadow just southeast of the Cranberry Hill MAPS site by a few hundred meters. Weather parameters such as temperature, wind speed and direction, precipitation, humidity, and barometric pressure are collected by the station and stored in its memory. All data is then downloaded via satellite back to the Refuge office in King Salmon. This new station allows for constant monitoring of weather all day and all year, thus helping us maintain records of the weather, and its trends, from Mother Goose Lake.

MAPS Banding

The field research team consisted of two biological technician and two to three refuge interns. Biological technicians had at least two seasons of mist-netting and banding experience and had advanced avian aging and sexing skills. Before the MAPS season refuge interns received an intensive two-week training session covering mist net operation, banding techniques, sexing and aging techniques, and data management. Intern training continued throughout the season under technician supervision.

MAPS started at the Lake site on June 10 and concluded at the Cranberry Hill site on August 4. We conducted constant effort mist netting and banding consistent with the 2000 MAPS manual (Burton et al. 2000) and methods used in 1999. Net setup was

consistent with 1998 procedures (Convery et al. 1999), with height and tension the main concerns. We recorded data on the standard 1998 MAPS banding sheets, modified on the back to include additional measurements for some species (see below). Beside the standard MAPS forms, additional information was recorded on station specific sheets including Mist Net Efficiency, Net Run Times, and Daily Journal (see draft Wildlife Inventory Plan).

We collected habitat data for each MAPS site this year in accordance with IBP's new Habitat Structure Assessment Protocol, or HSA (Nott et al. 2000). The goals of HSA are to provide a general classification of habitat types, obtain a method for monitoring changes in vegetation due to management practices or succession, and describe the habitat structure and spatial patterns of vegetation within the study area (Nott et al. 2000). This information, in conjunction with the banding data collected, will potentially allow IBP to provide management recommendations that will help conserve the diversity and abundance of bird species on certain lands.

We continued to collect additional measurements on most of the species requested by BPIF (1994-1996) including hermit thrush (*Catharus guttatus*), gray-cheeked thrush, yellow warbler (*Dendroica petechia*), orange-crowned warbler, and Wilson's warbler. Extra measurements were not taken on alder flycatcher because of their low capture rate and on pine grosbeaks (*Pinicola enucleator*) because they fair poorly during extended handling.

Lotus Approach was used for electronic data storage and manipulation. All our data were then error checked against the original banding sheets. We also used an updated version of the program called *MAPSPROG* from IBP, which ran verification procedures on the MAPS data. Data was checked for inconsistencies within and between records. Records were also checked against past years' data and problems were located and corrected. Returning band numbers were also verified against previous years' data. Our verified MAPS data was then sent to IBP for use in their continent wide songbird population analysis. We also used the verified data to generate band schedules for the Bird Banding Laboratory (BBL), using a new program called *BAND MANAGER*.

This year productivity [defined as the ratio of hatch year (HY) birds to after hatch year (AHY) plus HY birds] was analyzed at each site for the three most abundant neotropical migrant species: Wilson's warbler, orange-crowned warbler, and hermit thrush. The analysis includes first time 2000 captures (new and first time returns) for each age class with the exclusion of recaptures. One aspect of breeding chronology, that is fledging, was also examined for these three species by analyzing capture rates (birds/100 net hours) of HY versus AHY birds for each MAPS period (10-day periods starting on June 10 for Alaska). By comparing the rates of these two age groups, we can get an idea of when captures of HY birds first occur in our nets, and when they exceed the AHY captures. Furthermore, productivity was calculated for four other species of which the sample size was greater than 30 captures among the three stations: common redpoll (*Carduelis flammea*), golden-crowned sparrow, fox sparrow, and yellow warbler.

Color Banding

We continued color banding birds in 2000 with slight modifications in past protocol. Not only were birds issued color bands at the Lake site as 1999, we reinitiated the color banding effort at the Mountain site (absent since 1996). We continued to color band only hermit and gray-cheeked thrush, and golden-crowned, fox, and Gambel's white-crowned sparrows; however, for the first time we included hatch year birds in the color banding effort. We choose these species because of their high visibility and because they are known breeders at both sites. Color band combinations in 2000 consisted of either two color bands placed on the left leg and the single metal band placed on the right leg, or two color bands on the left leg with the metal band and a color band on the right leg. The color band combination for each bird was recorded on the back of the MAPS data sheets and entered into a separate color-banding notebook.

Migration Banding

Migration banding began on August 5 using the ten Lake MAPS nets, and adding nets eleven and twelve. A minimum of five nets were opened daily depending on current weather conditions (Ralph et al. 1992), anticipated bird numbers, and staff capabilities. Bird numbers were anticipated by previous day's captures and the relative density of birds around the net lanes before net opening. During the first two weeks of migration banding two additional trained bander/pickers and three beginning pickers, were added to the staff. We followed MAPS protocol during migration with the exception of starting time. Nets were opened thirty minutes after sunrise instead of forty-five minutes. During periods of high volume capture (more than 50-100 birds waiting banding) all morphological data were not collected on each banded bird. Required data included species, age, sex, how aged, how sexed, date, time, and net number with wing length and weight collected as time allowed. At the end of the season we verified data using in-house verification standards that were developed in 1998 and are found in the Wildlife Biologist computer under c:\My documents\biology\birdcamp\Mogo98\Verification Protocol for 98 Banding Data. We then merged our data with the rest of the season's banding records and put all the information through the new Band Manager program to create band schedules.

Off-road Point Counts

Off-road point counts were conducted at six locations in the Mother Goose Lake basin with protocols established by BPIF (Handel 1998). Previously established routes were remarked with flagging and each point was located prior to the survey date (Fig. 2). Data were submitted to BPIF for inclusion in statewide analysis.

Nest Searching and Monitoring

This year we developed and implemented a new protocol for an intensive nest searching and monitoring effort encompassing both the Lake and Mountain sites. Nest searching became an integral component of general procedures differing from previous years' in which nest searching was primarily incidental. The grid system at the Lake site, which was established in 1998, was adjusted to fit known 25 m. intervals determined by latitude and longitude coordinates obtained from GIS software and set in place using handheld GPS units. A grid was also established at the Mountain site following these same

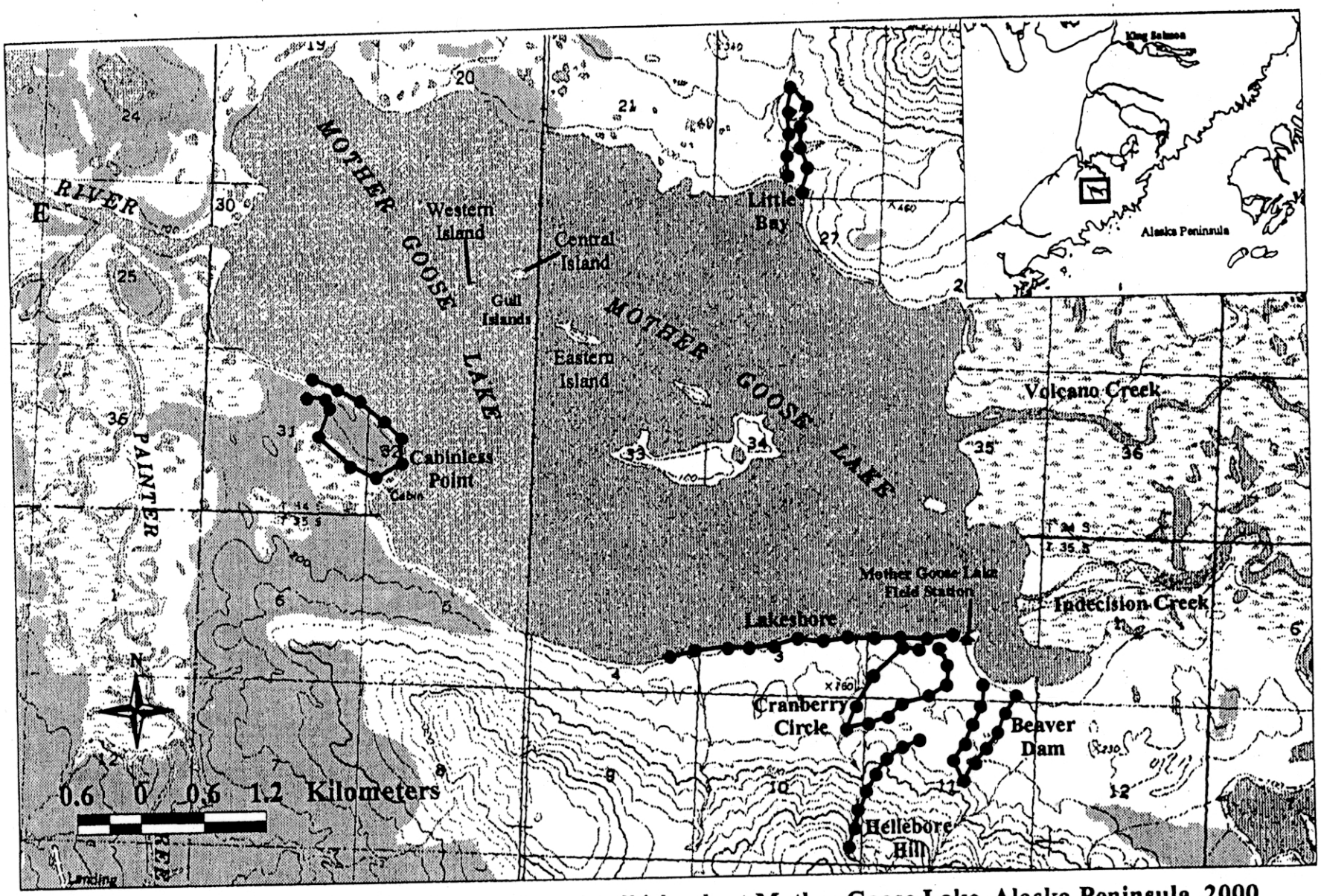

Figure 2. Location of off-road point counts and gull islands at Mother Goose Lake, Alaska Peninsula, 2000.

procedures. The two grids were then set-up at the beginning of the field season with each grid point marked with a unique number on bright colored flagging. The grids helped to plot nest locations and help determine the distribution of nests throughout the study area. The grids were also latter used during habitat mapping and for general orientation on the grid.

Upon locating a nest, the coordinates of the nearest grid point were written down on our nesting data cards. The grid point was then flagged with a color different from that of the original grid marker so others could see there was a nest in the area. This additional flagging was also labeled with the species found, date, and who located the nest. Another marker was then used to flag a location closer to the nest. Compass bearings and distances were taken from the grid marker to the nest marker and then from the nest marker to the nest. The status of the nest was also noted (incubating, nestlings) including attempts to age chicks if present. All of this additional information was recorded on our nesting data card (see data forms and guidelines in draft Wildlife Inventory Plan). This process of marking nests allowed other members of the crew to relocate the nests for subsequent nest monitoring throughout the nesting process.

Using known information on life histories of pertinent species (Ehrlich et al. 1988), nests were monitored in a manner that would reduce possible disturbances to the nesting individuals. This included visiting nests with a frequency that would permit us to successfully observe nesting chronology and fate of the nest without causing undo stress and disturbance to the nest and its contents. Thus nests were only checked when a change in nesting cycle was anticipated (i.e., hatching, brooding, fledging). One exception to the nest visitation rule occurred on nests that were being photo documented. Certain nests of different species were selected and followed daily for their development. At a predetermined time each day photo nests were visited and two to three pictures were taken of the nest and its contents with a digital camera. These photos were then stored on a computer disk and within a computer file on the computer itself. During each subsequent nest visit information on date, time, stage of nest, (building, laying, incubating, hatching, nestlings, fledged, failed), adult presence, amount of disturbance to the nest, and observer was collected and placed on the nest card. We also placed comments on the nest card about overall nest appearance and possible nest age and success. Furthermore, information on nest vegetation was collected at all nest locations using a method designed by the Breeding Bird Biology and Monitoring Database (BBRD) and modified by Wildlife Biologist Brian McCafferey from the Yukon Delta National Wildlife Refuge and our own project staff (see data forms and guidelines in draft Wildlife Inventory Plan).

Color Band Resighting

Color band resighting was conducted simultaneously with nest searching within the Lake and Mountain site grids. Using the grid system, color band resight data were noted and plotted relative to the location of the birds observed. Color band resighting allowed for the identification of individual birds, partners, and their nests, and aided in the identification of individual territories. Furthermore, due to the increased nest searching effort, color band resighting aided in identifying the different sexes of a nesting pair and

observing which gender participated in nesting activities. Color band resighting also aided in identifying pairs of color banded birds who attempted a second nesting effort during the season.

Vegetative Phenology

Twenty-three species of plants commonly found within the study area at Mother Goose Lake were monitored throughout the season. Species were selected to represent a wide range of families and growth forms, but we also choose relatively easily identifiable species. These study species were monitored weekly to determine changes in life cycle. Criteria noted included if the plant was budding, flowering, if fruit was developing, if fruit was ripening, or if the flower, fruit, or plant was withering. These data will be compared year to year in the future.

Gull Colony Monitoring

Three small (less than 10 hectare) islands in the northwest section of Mother Goose Lake provide suitable breeding habitat for glaucous-winged gulls (*Larus glaucescens*) (Fig. 2). To minimize disturbance to the colonies, we only monitored the colonies by observation, looking at colony size and breeding chronology. We surveyed the colonies on eight occasions: June 13, June 20, June 27, July 5, July 18, July 29, August 8, and August 16. We estimated adult population size by slowly circumnavigating each island in an 18' aluminum boat while each observer (n=5,4,3,3,3,3,4,4) counted all adult birds detected. No HY birds were counted during the boat survey. The driver maintained a distance adequate enough not to disturb the birds (about 150-200 meters). Only those birds seen on land were tallied; those flying above or near the islands were not counted unless they landed or took off from the islands. Observer counts were averaged for each island survey. Immediately after we completed our boat survey during the first four censuses (6/13-7/5), we landed on Western and Central Islands and searched for nests. All nests and contents (e.g. empty, one egg, two chicks, one eggshell) were noted. Observers followed a predetermined transect to insure adequate coverage and to prevent double counting of nests. To minimize disturbance we attempted to survey each colony in 30 minutes or less and with one pass. After July 5 the four remaining censuses (7/18 –8/16) consisted only of circumnavigating the islands and counting gulls. No onshore nest searching was conducted.

Avian Sightings

Avian sightings were compiled daily throughout the 2000 field season. Methods for collection were consistent with those used in 1999. Procedures and deviations from previous years are available in the 1999 MOGO seasonal report (Adler 1999).

Small Mammal Trapping

We conducted small mammal trapping concurrent to the landbird project following 1999 protocols and trapping locations. Details of the project are available in the small mammal report (Young 2000).

Miscellaneous

A daily journal was again kept throughout the field season at Mother Goose Lake. We also continued to use our PLGR+96 handheld GPS unit to locate and mark objects in and around the MOGO study site. Details on journal recording and GPS use are available in the 1999 Mother Goose seasonal report (Adler 1999).

In 2000 we also performed two additional research tasks for other biologists in Alaska. Our first task was associated with our bird banding. We collected about 12 breast feathers from any black-capped chickadee (*Poecile atricapillus*) we caught in our nets. Feathers were then placed in a small manila envelope and labeled with capture date, age and sex of bird, and where caught. We collected feathers from 30 individual birds and sent the samples to Anchorage, AK for use in a population genetics study.

Our second task was in conjunction with the King Salmon Fishery Resources Office. We made several trips down to the confluence of the King Salmon River and Painters Creek to catch sockeye salmon (*Oncorhynchus nerka*) for genetic analysis. We used a 10 m. gill net and swept the river for fish. Once fish were caught in the net, we would pick them from the net, place them in a holding pen, and give them time to calm down. After a few passes with the gill net we would stop and proceed with data and tissue collection on fish from the pen. Information collected from each fish was sex, length, and a small tissue sample from the dorsal fin of each fish. Samples were placed in small alcohol filled vials and labeled with individual numbers. Once sampling was complete, the fish was released back to the river. Our task was complete when we had sampled 100 individual sockeye.

Finally, we collected two hare carcasses that were found within the MOGO study area. The carcasses were labeled, frozen, and sent to Eric Waltari, a graduate student at the University of Alaska, Fairbanks. The carcasses were examined and identified as snowshoe hares (*Lepus americanus*), and are believed to be the most southern record of snowshoe hare on the Peninsula.

RESULTS AND DISCUSSION

Weather

Total rainfall for the season (98 days) was 218.2 mm (Table 1). In 2000 we experienced the highest percent days with precipitation for August with 74% days with rainfall. The season average of percent days with rainfall was 67%, just short of last year's average of 69%. Average monthly maximum and minimum temperatures for June, August, and September fell within the range of average temperatures for the past seven years. July's mean minimum temperature though was 43° F, the lowest documented for the past seven years. The percentage of possible banding days exceeded all previous years with an average of 82% of all days being bandable. A day is considered bandable if all weather conditions (wind, rain, temperature) are at optimum levels for banding prior to and during the designated net opening period. Conditions however may later deteriorate and call for the closure of nets. The month of July yielded the highest percentage of bandable days to date with 94% of the days in that month being considered bandable. All other months

Table 1. Weather data collected at Mother Goose Lake, Alaska Peninsula, June - September 1994-2000. September is not included in the 1994 analysis.

Month	Rainfall % days	Rainfall cm	Temperature (F) Mean Max.	Temperature (F) Mean Min.	% Bandable days
1994 (June 21 - Aug 27)					
June	42	17.7	64	43	64
July	68	78	64	47	68
August	44	52.7	69	49	48
SEASON AVG.	Avg. 53	TOTAL 148.4	Avg. 66	Avg. 48	Avg. 60
1995 (June 5 - Sept 21)					
June	50	18.1	64	43	69
July	55	74.2	66	47	61
August	65	105.9	61	47	45
September	76	81.5	60	48	57
SEASON AVG.	Avg. 60	TOTAL 279.7	Avg. 63	Avg. 45	Avg. 58
1996 (June 6 - Sept 18)					
June	59	52.2	56	41	63
July	42	27.2	65	46	65
August	73	110.9	60	45	60
September	61	71.6	57	37	67
SEASON AVG.	Avg. 59	TOTAL 261.9	Avg. 60	Avg. 42	Avg. 63
1997 (June 6 - Sept 16)					
June	40	19.3	63	39	64
July	67	56.3	70	47	73
August	58	68.7	67	50	74
September	86	75.7	60	49	43
SEASON AVG.	Avg. 60	TOTAL 220	Avg. 66	Avg. 46	Avg. 64
1998 (June 6 - Sept 14)					
June	40	42.4	59	41	80
July	67	31.2	64	47	84
August	58	90.7	61	44	71
September	86	59.3	56	43	50
SEASON AVG.	Avg. 63	TOTAL 223.6	Avg. 61	Avg. 45	Avg. 74
1999 (June 6 - Sept 16)					
June	76	41.1	58	43	72
July	61	34.6	62	45	81
August	61	106.1	61	42	74
September	88	47.5	58	41	63
SEASON AVG.	Avg. 69	TOTAL 229.3	Avg. 60	Avg. 43	Avg. 74
2000 (June 8 - Sept 14)					
June	50	40.7	58	39	77
July	64	51.5	65	43	94
August	74	60	61	45	81
September	86	66	58	45	64
SEASON AVG.	Avg. 67	TOTAL 218.2	Avg. 61	Avg. 43	Avg. 82

June (77%), August (81%), and September (64%) fell within the ranges of previous years' bandable days.

MAPS Banding

Capture Success

We made 1587 captures (1051 newly banded) of 15 species of birds in 1077.7 net hours (Tables 2, 3, and 4). Lake site had the highest number of newly banded birds (398), followed by Mountain site (296), and then the Cranberry Hill site (357). Of the 398 newly banding birds at the LAKE site, one golden-crowned sparrow AHY female, was captured outside of MAPS hours, but within the MAPS season. The female was captured at her nest with a target net we placed nearby. We captured this female with the target net because we wanted to color band her and follow her activity throughout the nesting period. She was later recaptured during MAPS banding and incorporated into the data. "New" captures for 2000 are defined as a sum of newly banded birds and first captures of returning birds (birds recaptured from previous years' effort). To track seasonal phenology, capture rates are plotted by MAPS period and station (Fig. 3). Relative to 1998-1999, the 2000 season showed similar trends for capture rates in periods 5-8, and like 1998 there was a marked increase in captures during period 10 (Jul 30-Aug 8). This increase is likely caused by an influx of dispersing birds into the Mother Goose Lake area. Overall, this year's capture rate of newly banded birds was much higher than 1999 and the fourth highest in the last seven years (Fig. 4). In 2000, the most successful nets remained consistent with previous years. This included nets ten (341.67)[1] and one (211.11) at the Lake site, nets two (188.89) and one (166.67) at Mountain site, and nests nine (333.33) and ten (247.22) at Cranberry Hill (Table 4).

Productivity for the three tested neotropical species (Wilson's and orange-crowned warblers and hermit thrush) varied this year between the three sites. In 1999 (a year of low productivity) hermit thrush and orange-crowned warbler productivity was highest at the Lake site, while Wilson's warbler productivity was the highest at the Mountain site. In 2000 both orange-crowned warbler and Wilson's warbler showed the highest productivity at the Cranberry Hill site, while hermit thrush showed the highest productivity at the Mountain site (Fig. 5). Though the Cranberry Hill data may suggest high productivity for orange-crowned and Wilson's warbler, this should be looked at with caution. Since a majority of HY captures occurred late during period 10 (August 4), they are most likely made up of dispersing birds along with a few locally produced young.

Productivity for these three selected species was determined to be higher, for all MAPS stations in 2000, compared to 1999, but is still variable when compared with other years of the study (Fig. 5). This variability is partly due to hatching and dispersing phenologies, which have an affect on productivity calculations. Early hatch dates, and early dispersal times will increase captures and may have a tendency to weigh productivity calculations. Tests of statistical significance were not run on this information this year; however, more rigorous tests are planned for a final report. This year productivity was measured for all species with >30 captures at all banding sites (Fig. 6).

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[1] All capture rates have units of birds/100 net hours.

Table 2. Total new banded birds, by age group, during MAPS and migration banding at Mother Goose Lake, Alaska Peninsula, June-September 2000.

	MAPS STATIONS															
	LAKE SITE			MTNS SITE			CRAN SITE			FALL MIGRATION			TOTALS			TOTALS
Species	AHY	HY	UNK	AHY	HY	UNK	AHY	HY	UNK	AHY	HY	UNK	AHY	HY	UNK	ALL AGES
Downy Woodpecker										1	3		1	3		4
Alder Flycatcher	3			2			1				1		6	1		7
Northern Shrike											2			2		2
Tree Swallow	5												5			5
Black-capped Chickadee		6		1	4		1	1		1	43		3	54		57
Ruby-crowned Kinglet											4				4	4
Gray-cheeked Thrush	5	1		2	1		6	2		8	50		21	54		75
Hermit Thrush	8	14		6	18		7	4		7	230		28	266		294
American Robin	7	4		1	4		1	2		1	11		10	21		31
Orange-crowned Warbler	12	11		11	8		11	27		35	241	1	69	287	1	357
Yellow Warbler	11	8		26	5		2	4		11	230	1	50	247	1	298
Wilson's Warbler	79	128		53	74		45	169	1	52	2158	1	229	2529	2	2760
American Tree Sparrow		4			1					3	136		3	141		144
Savannah Sparrow		3		2	5		1	1		1	78	1	4	87	1	92
Fox Sparrow	7	3		7	6		3	7		3	117		20	133		153
Lincoln's Sparrow											1					1
G.White-crowned Sparrow	1			1				1		2	21		4	22		26
Golden-crowned Sparrow*	8	10		11	5		8	4		5	79		32	98		130
Slate-colored Junco											1			1		1
Pine Grosbeak											1			1		1
Common Redpoll	46	14		35	7		26	22		78	141		185	184		369
Totals	192	206	0	158	138	0	112	244	1	208	3548	4	670	4131	9	
	LAKE Total		398	MTNS Total		296	CRAN Total		357	MIGR Total		3760	Grand Total			4811

* = Golden-crowned sparrow total includes one AHY bird that was target banded, on LAKE site, outside normal MAPS hours.

AHY= After Hatch Year

HY= Hatch Year

UNK= Unknown

Table 3. Total new banded birds during MAPS and migration banding at Mother Goose Lake, Alaska Peninsula, June-September 1994 - 2000.

Species	MAPS*							MIGRATION*						
	1994**	1995	1996	1997	1998	1999	2000	1994	1995	1996	1997	1998	1999	2000
Common Snipe													1	
Belted Kingfisher									1					
Downy Woodpecker	1	1	1	2	8			1	5	2	6	1		4
Alder Flycatcher	8	9	5	3	3	7	6	1	3	7	4	4	1	1
Northern Shrike		2		4				4	8	5	15	4	1	2
Black-billed Magpie		1						1	2		1			
Tree Swallow	21	110	6	6	10	3	5			2				
Violet-green Swallow	2													
Bank Swallow		22	2											
Black-capped Chickadee	13	12	28	33	70	6	13	95	40	71	214	202	11	44
American Dipper										1				
Golden-crowned Kinglet									1	1				
Ruby-crowned Kinglet								1	3	1	3	3		4
Gray-cheeked Thrush	36	37	24	16	15	16	17	30	39	25	31	21	36	58
Hermit Thrush	60	86	86	65	107	57	57	228	202	198	195	230	144	237
Varied Thrush				1										
American Robin	1	11	7		10	26	19	1	4	3	1	5	13	12
American Pipit								7	2	1				
Orange-crowned Warbler	47	102	72	85	228	86	80	99	76	124	240	280	282	277
Yellow Warbler	59	62	58	54	51	59	56	240	211	352	375	317	267	242
Wilson's Warbler	549	1069	470	472	604	386	549	744	1227	1316	1280	1344	2614	2211
American Tree Sparrow	4	6	1	3	1	2	5	377	182	205	118	99	94	139
Chipping Sparrow											1			
Savannah Sparrow	33	31	12	42	6	9	12	79	79	240	85	36	66	80
Fox Sparrow	25	37	26	19	41	20	33	42	28	52	17	15	129	120
Lincoln's Sparrow														1
G.White-crowned Sparrow	6	10	9	4	11	4	3	39	17	35	32	19	24	23
Golden-crowned Sparrow	54	56	48	19	39	29	46	73	45	56	44	47	125	84
Slate-colored Junco								3		1		3	1	1
Lapland Longspur			1											
Pine Grosbeak	4	9	6	8	2	6		7	13	11	6		1	1
Common Redpoll	47	46	50	43	72	77	150	146	154	226	96	47	122	219
Hoary Redpoll								1					1	
Pine Siskin													5	
Unid. Bird					1					1		1		
Totals	970	1719	912	879	1279	793	1051	2219	2342	2936	2764	2678	3938	3760

* = 1994 and 1995 MAPS data contains birds captured between June 10 and August 08. Migration data starts on August 09.

** = 1994 MAPS data is for the Lake and Mountain sites only. Cranberry Hill was not established yet.

Table 4. Summary of individual mist net efficiencies during banding operations at Mother Goose Lake, Alaska Peninsula, June-September 2000. (Capture rate equals total captures / 100 net hours.)

Net #	1	2	3	4	5	6	7	8	9	10	11	12	UNK	Total
MAPS Lake Site														
Total Birds	76	71	59	47	21	49	46	52	43	123				587
Net hrs	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00				360.0
Capture rate	211.11	197.22	163.89	130.56	58.33	136.11	127.78	144.44	119.44	341.67				163.06
MAPS Mountain Site														
Total Birds	60	68	56	40	33	53	56	44	47	31				488
Net hrs	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	35.00	34.67				357.7
Capture rate	166.67	188.89	155.56	111.11	91.67	147.22	155.56	122.22	134.29	89.41				136.44
MAPS Cranberry Site														
Total Birds	37	23	35	52	27	32	23	73	120	89				511
Net hrs	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00				360.0
Capture rate	102.78	63.89	97.22	144.44	75.00	88.89	63.89	202.78	333.33	247.22				141.94
Migration (Aug 5-Sep 13)														
Total Birds	642	395	336	292	185	260	294	241	215	577	445	580	4	4466
Net hrs	123.83	124.66	128.83	135.16	136.33	132.66	137.66	140.83	139.83	129.50	132.33	72.00		1533.6
Capture rate	518.45	316.86	260.81	216.04	135.70	195.99	213.57	171.13	153.76	445.56	336.28	805.56		291.21

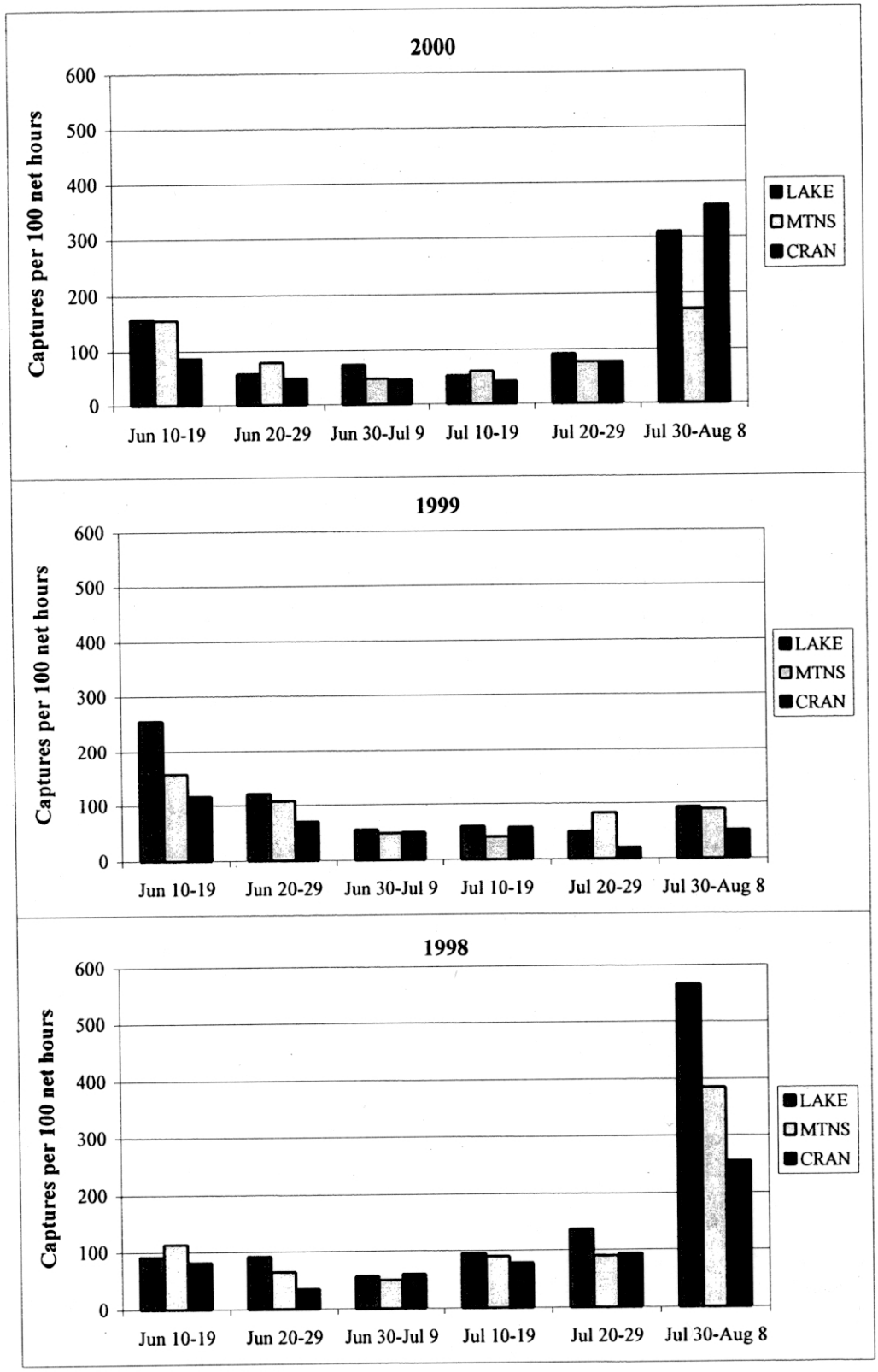

Figure 3. Capture rates of new and first capture of returning birds by MAPS station at Mother Goose Lake, Alaska Peninsula, June -August 1998-2000.

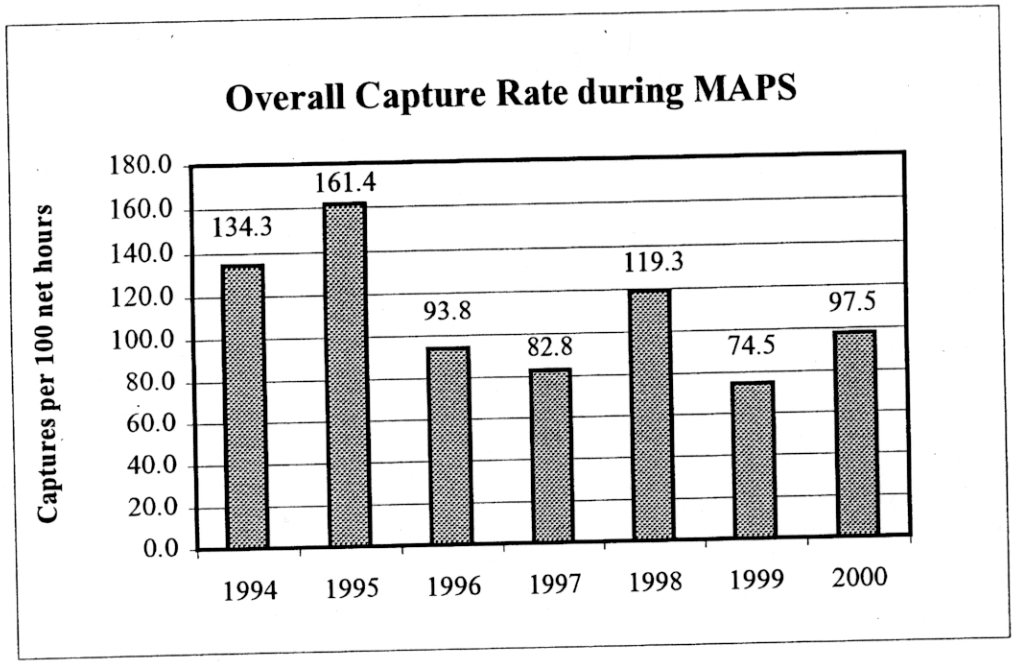

Figure 4. Overall capture rates of newly banded birds for each MAPS season at Mother Goose Lake, Alaska Peninsula, 1994-2000.

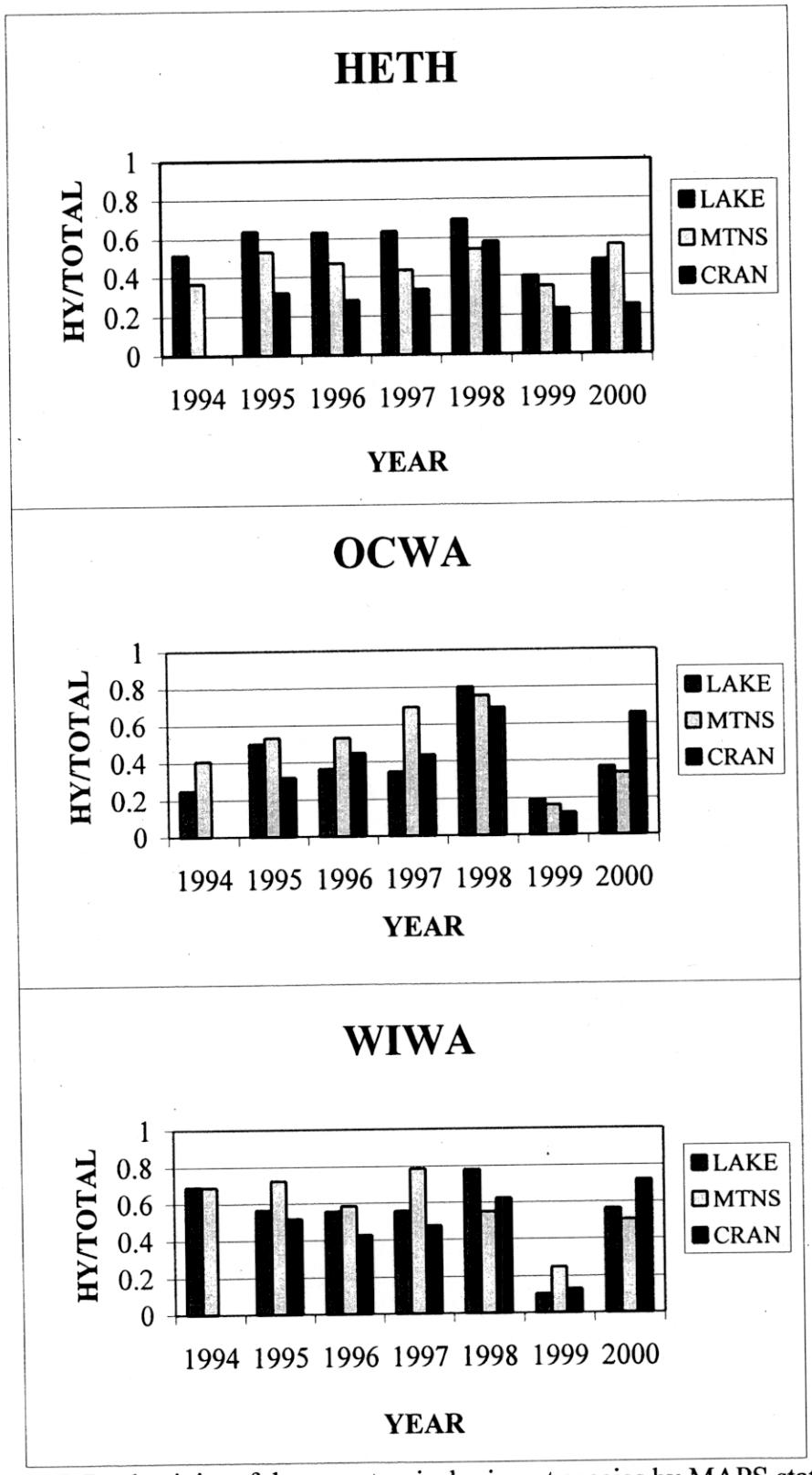

Figure 5. Productivity of three neotropical migrant species by MAPS station as shown by the ratio of HY birds to AHY + HY birds at Mother Goose Lake, Alaska Peninsula, June-August 1994-2000.

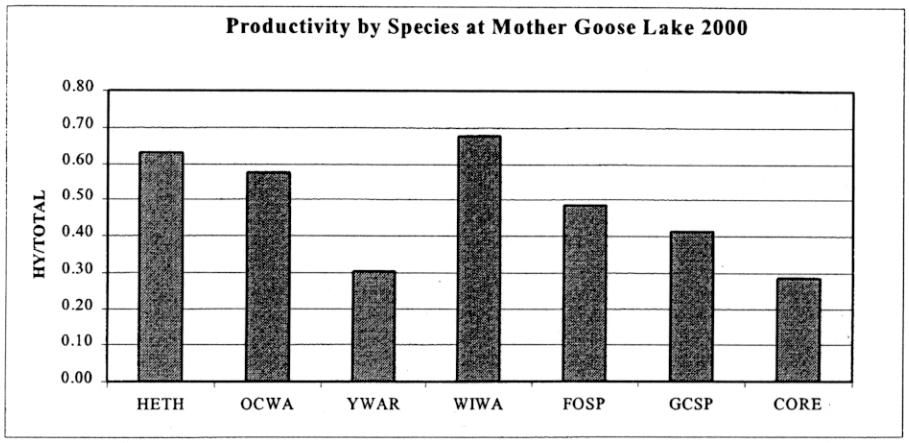

Figure 6. Productivity of selected species as shown by the ratio of HY to Total (HY/AHY+HY) birds during MAPS, at Mother Goose Lake, Alaska Peninsula, June-August 2000.

Of the seven species analyzed for 2000, Wilson's warbler showed the highest productivity in the Mother Goose Lake area followed by hermit thrush and orange-crowned warbler respectively. Fledging time for the three species mentioned above is reflected in Figures 7a, 7b, and 7c.

First captures of HY birds varied considerably this year compared to 1998 and 1999. In 1998 HY captures for all species were recorded in MAPS period 8 (July10-19) for the Lake and Mountain sites. In 1999 HY captures for hermit thrush, Wilson's warbler, and orange-crowned warbler first occurred in periods 8, 9, and 10 respectively. In 2000, for the first time since this analysis was started in 1998, captures of HY hermit thrush were recorded during MAPS period 7 (Jun 30-Jul 9) for all sites. Captures of both Wilson's warbler and orange-crowned warbler HY were first recorded in MAPS period 9 (July 20-July 29) for all MAPS sites. Numbers of HY birds increased compared to 1999. As expected, the number of HY captures surpassed that of AHY captures, for all three species, during MAPS period 9. Possible reasons for the observance of HY birds earlier, relative to previous years, could be the result of a relatively early spring and subsequent facilitation of the breeding cycle.

Overall, we can see from this information that the productivity of the Mother Goose area rebounded from the low numbers observed in 1999 and are comparable with other years in this study. The exact reason contributing to the rebound in productivity from 1999 is hard to pinpoint. Some factors that may have helped this season include an early spring, and a low density of nest predators, including small mammals.

Recaptures, Returns, and Recoveries

All birds captured with a band are coded as recaptures. Data searches later reveal if these birds are returns (birds banded in previous years that were recaptured) or same year recaptures. During MAPS 517 birds were labeled as recaptures; 139 of these were returns, 179 were first time recaptures for newly banded birds, and 67 were first time repeats for returning birds. Some birds were recaptured multiple times during the season. Ten birds were recaptured, but escaped before their bands were read. This year's

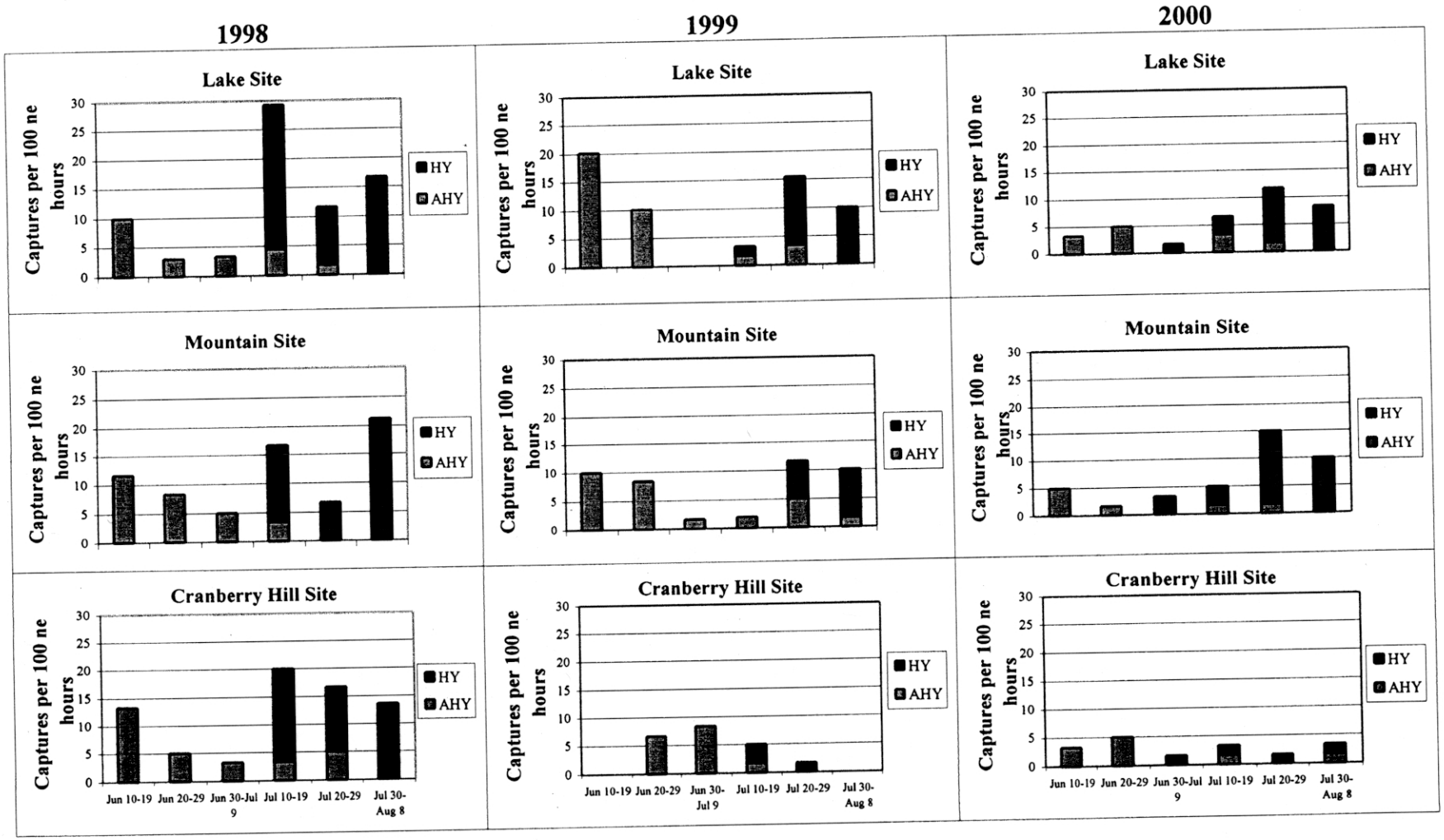

Figure 7a. Fledging times shown by MAPS capture rate of HY versus AHY hermit thrush at Mother Goose Lake, Alaska Peninsula, June-August 1998-2000. (Only first captures represented)

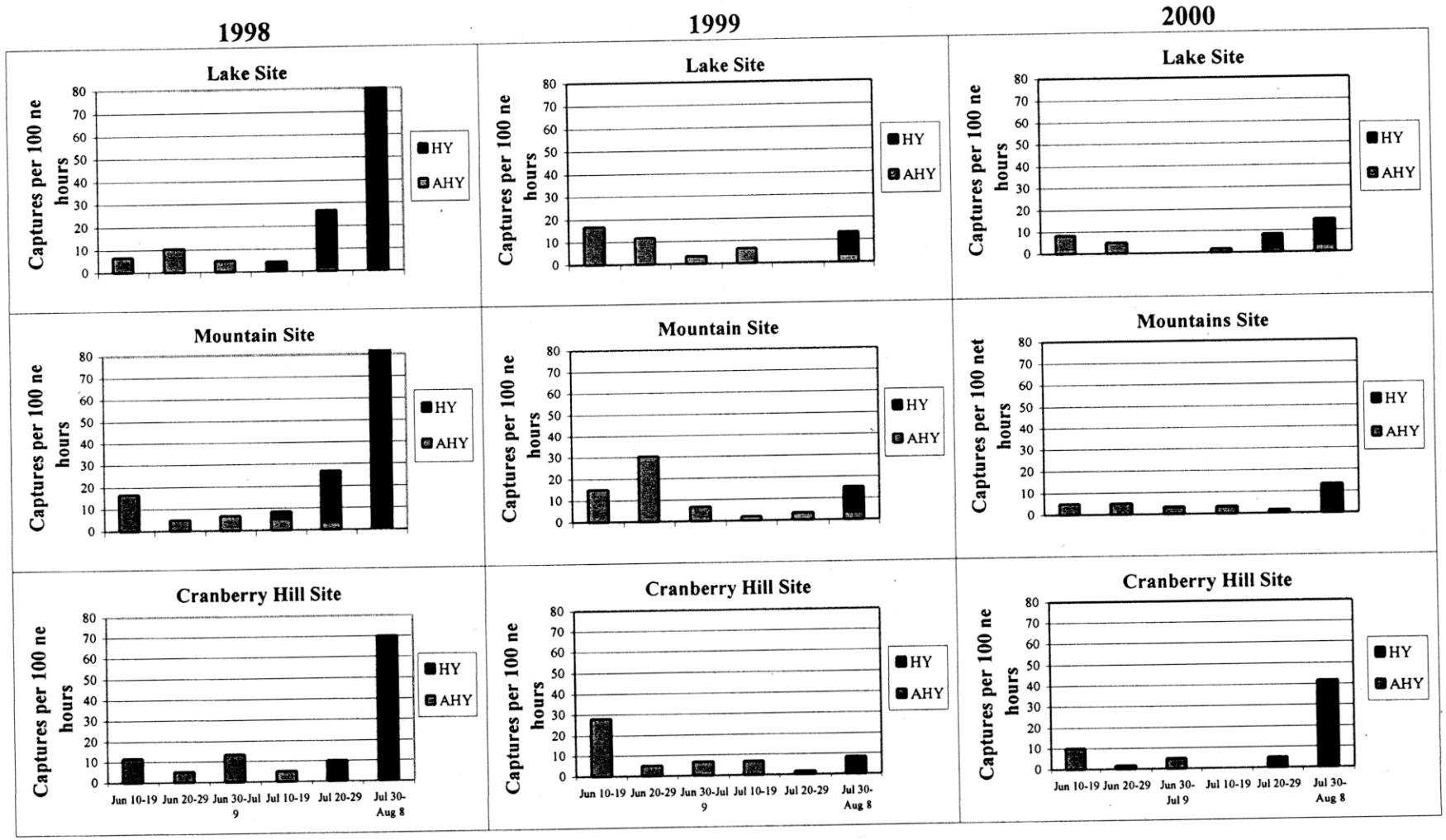

Figure 7b. Fledging times shown by MAPS capture rate of HY versus AHY orange-crowned warblers at Mother Goose Lake, Alaska Peninsula, 1998-2000 (only first captured represented).

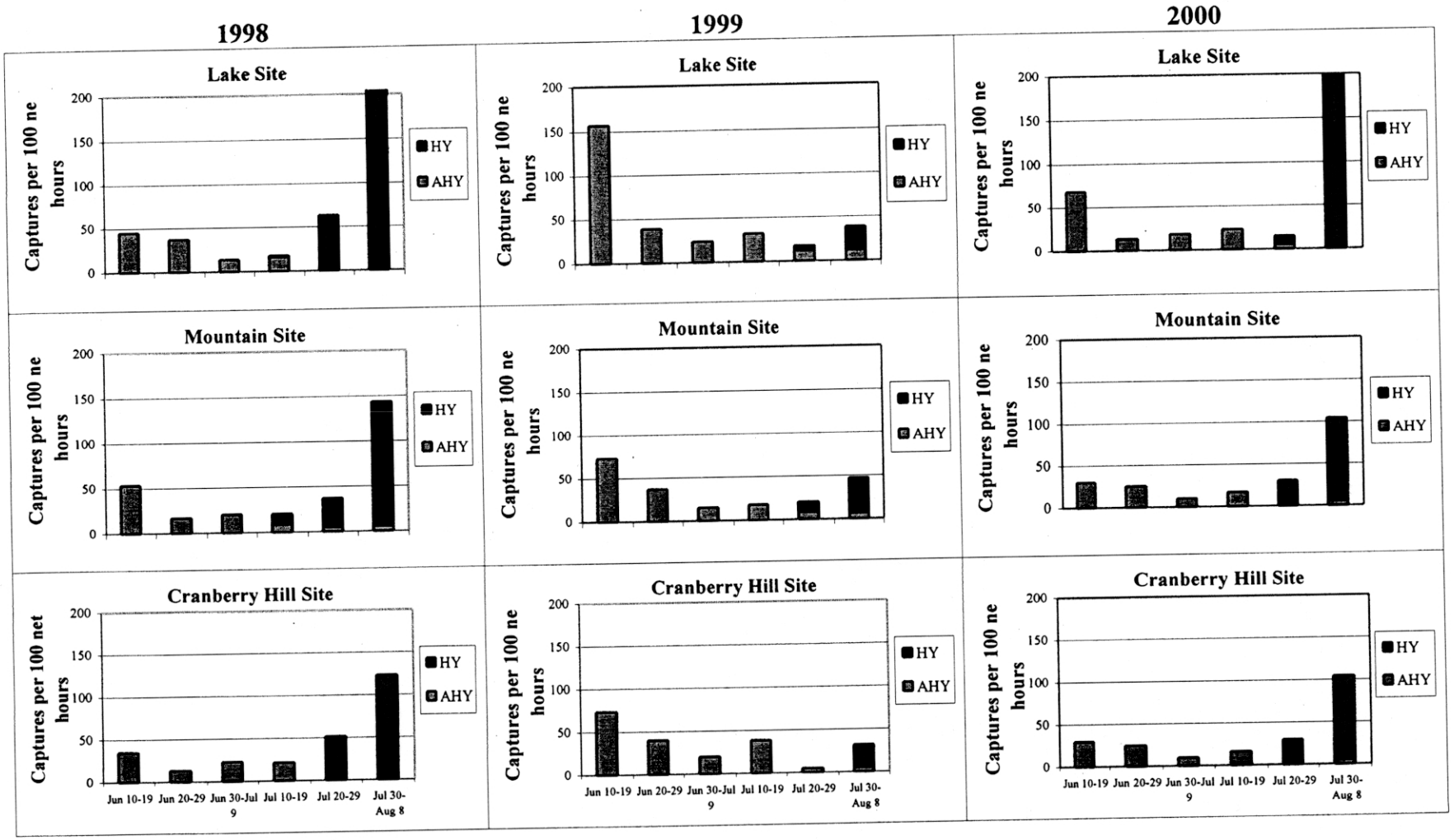

Figure 7c. Fledging times shown by MAPS capture rate of HY versus AHY Wilson's warbler at Mother Goose Lake, Alaska Peninsula, June-August 1998-2000. (only first capture represented)

recapture rates (Table 5) reflect the percent of individuals that were recaptured (179 + 67) and disregards multiple recaptures of individuals. Percentage recapture, or recapture rate, is calculated as the sum of first time recaptures for new birds plus first repeats for returned birds divided by newly banded birds plus returns for the season.

In 2000, the likelihood of being recaptured varied between MAPS sites. Both the Lake site and Mountain site recapture rates were similar to those of 1999. This year Lake had a recapture rate of 18.6% while the Mountain site's recapture rate was 25.7%. In 1999 the recapture rates were 18.5% and 29.4% respectively. Cranberry Hill was the only site to show a considerable change in recapture rate. In 2000 the rate dropped to 18.5% from the 30% seen in 1999 (Table 5). As seen, species recapture rates are highly variable between MAPS sites. There is also the tendency for hatch year captures to influence total captures which can then markedly change recapture rates. This could account for some differences in recapture rates among sites.

Returns provide vital information for survivorship studies. In 2000, 139 birds returned from previous years compared with 87 birds in 1995 (only two stations banding birds in 1994), 123 birds in 1996, 91 birds in 1997, 108 birds in 1998, and 117 birds in 1999. As expected, the majority of returns were banded in 1999 (two from 1994, two from 1995, six from 1996, 13 from 1997, 35 from 1998, and 81 in 1999). Table 6 shows return information for all years of banding and is broken down by species and by station where the individual was captured in that year. Again, Wilson's warbler and hermit thrush consistently have high numbers of returns over time, with orange-crowned warblers not far behind (Table 6). This probability of returning reflects capture numbers for the two warbler species, and for hermit thrush. Fifteen of the 2000 returns were banded as HY's in 1999. One of these birds (6.7%) returned to its natal site.

During the 2000 field season we had two birds recovered at other locations. One bird was a yellow warbler that was first banded at MOGO on July 15, 1996 as an AHY female. This bird was recovered in Pt. Baker, AK on May 29, 2000. Unfortunately, this bird was recovered by a cat, so there will be no future recoveries of this bird. The second bird recovered was a Wilson's warbler that was originally banded at MOGO on August 14, 2000 as a HY male and was recaptured in Mackenzie, British Columbia on September 10, 2000. The bird was captured in a mist net and then released. Six birds banded at MOGO have been recovered at other places around the country during all years of the study, and one bird banded elsewhere, was recovered at Mother Goose Lake.

Breeding Status

Based on specific breeding status definitions of IBP (Desante & Burton 1998), we confirmed 13 breeding landbird species at the Lake site, 13 at the Cranberry Hill site, and 15 at the Mountain site, plus three likely breeders at Lake, three at Cranberry Hill, and one likely breeder at Mountain site (Table 7). There were a few species that changed breeding status at individual sites in 2000. At the Lake site black-capped changed from a likely breeder to a confirmed breeder, American pipit (*Anthus rubescens)*, northern shrike, and Lapland longspur (*Calcarius lapponicus*) lost their respective transient status, and pine grosbeak changed form a breeder to a likely breeder. At the Mountain site, tree

Table 5. Species recapture rates during MAPS banding operations at Mother Goose Lake, Alaska Peninsula, June - August 2000. (Percentage recapture is percentage of individual new and returning birds caught a second time in 2000.)

	MAPS SITES								
	LAKE SITE			MOUNTAIN SITE			CRANBERRY HILL SITE		
Species	Total *	Recap **	% Recap	Total	Recap	% Recap	Total	Recap	%Recap
Alder Flycatcher	3	0	0.00	5	1	20.00	1	0	0.00
Tree Swallow	5	1	20.00	0	0	0.00	0	0	0.00
Black-capped Chickadee	8	2	25.00	5	1	20.00	4	3	75.00
Gray-cheeked Thrush	8	2	25.00	5	1	20.00	10	6	60.00
Hermit Thrush	29	13	44.83	32	14	43.75	16	5	31.25
American Robin	13	4	30.77	6	0	0.00	4	0	0.00
Orange-crowned Warbler	30	6	20.00	24	6	25.00	41	7	17.07
Yellow Warbler	20	1	5.00	34	10	29.41	6	0	0.00
Wilson's Warbler	227	39	17.18	147	29	19.73	235	39	16.60
American Tree Sparrow	4	0	0.00	1	0	0.00	0	0	0.00
Savannah Sparrow	3	0	0.00	8	0	0.00	2	0	0.00
Fox Sparrow	12	1	8.33	17	7	41.18	11	2	18.18
Gambel's White-crowned Sparrow	1	0	0.00	2	0	0.00	1	0	0.00
Golden-crowned Sparrow	23	7	30.43	19	7	36.84	14	5	35.71
Common Redpoll	60	7	11.67	45	14	31.11	49	6	12.24
Totals	446	83	18.61	350	90	25.71	394	73	18.53

* Total number of newly banded and returning birds.

** Total number of individual birds recaptured within the season.

Table 6. Total band returns recorded during MAPS operations at Mother Goose Lake, Alaska Peninsula, June - August 1995-2000. (Site is location of return.)

	Lake Site						Mountain Site						Cranberry Hill					
	1995	1996	1997	1998	1999	2000	1995	1996	1997	1998	1999	2000	1995	1996	1997	1998	1999	2000
Species	#*	#	#	#	#	#	#	#	#	#	#	#	#**	#	#	#	#	#
Downy Woodpecker								1							1		1	
Alder Flycatcher							1	1	1	2		3			1			
Tree Swallow	1		1		1		1	1					1	1				
Black-capped Chickadee				2		2	1		1	1			2	2		2	1	2
Gray-cheeked Thrush	2	7	6	2	3	2	3	3	3	1	2	2	1	2		2	1	2
Hermit Thrush	9	4	1	6	5	7	4	9	2	5	5	8		7	8	8	7	5
American Robin		1		1	1	2				2	1	1						1
Orange-crowned Warbler	1	2	3	2	5	7	4	3	2	4	10	5	2	2	5	5	6	3
Yellow Warbler	1	3	1	3		1	6	5	6	6	6	3		2	1			
Wilson's Warbler	16	16	5	14	14	20	10	10	8	14	13	20	4	17	15	9	16	20
American Tree Sparrow																		
Savannah Sparrow							2	1				1						
Fox Sparrow			2	1	2	2		2	2	2	4	4						1
Golden-crowned Sparrow	5	4	3	4	4	5	5	5	3	3	5	3		4	5	2	2	2
White-crowned Sparrow	2	2	2	1								1	1			1		
Pine Grosbeak		3	1				1	1	1				1				1	
Common Redpoll			1	1				2			1	3				2		1
TOTAL	37	42	26	37	35	48	38	44	29	40	47	54	12	37	36	31	35	37
TOTAL "NEW" ***						240						212						149
% RETURN ****						20.0%						25.5%						24.8%

* Actual Number of Individual Birds that Returned.

** Note: Cranberry Hill was not operated in 1994; returns were banded at other Mother Goose stations.

*** "New" includes newly captured adult birds and first time returns for 2000.

**** % Return = (total returns/total "New" adult birds)*100

Table 7. Landbird presence and breeding status at Mother Goose Lake, Alaska Peninsula, June -July Information given for 3 MAPS stations in 2000. Information for the Mother Goose Lake Basin is cumulative from 1994-2000.

SPECIES	Lake	Mountain	Cranberry	Basin
Hairy Woodpecker				M
Downy Woodpecker	L	L	L	B
Western Wood-pewee				M
Alder Flycatcher	L	B	L	B
Northern Shrike				B
Black-billed Magpie	T		T	B
Common Raven	T		T	B
Tree Swallow	B	B	B	B
Violet-green Swallow				B
Bank Swallow	T			B
Black-capped Chickadee	B	B	B	B
Red-breasted Nuthatch				M
Brown Creeper				M
American Dipper				B
Golden-crowned Kinglet				M
Ruby-crowned Kinglet				M
Gray-cheeked Thrush	B	B	B	B
Swainson's Thrush				A
Hermit Thrush	B	B	B	B
Varied Thrush				M
American Robin	B	B	B	B
American Pipit				B*
Olive-backed Pipit				A
Tennessee Warbler				A
Orange-crowned Warbler	B	B	B	B
Yellow Warbler	B	B	B	B
Blackpoll Warbler				T
Wilson's Warbler	B	B	B	B
Northern Waterthrush				M
American Tree Sparrow	T	T		B
Chipping Sparrow				M
Savannah Sparrow	B	B	B	B
Fox Sparrow	B	B	B	B
Gambel's White-crowned Sparrow	B	B	L	B
Golden-crowned Sparrow	B	B	B	B
Slate-colored Junco				M
Lapland Longspur				B*
Snow Bunting				B*
Rusty Blackbird				M
Rosy Finch				B*
White-winged Crossbill				M
Pine Grosbeak	L	B	B	B
Pine Siskin				M
Common Redpoll	B	B	B	B
Hoary Redpoll				M

B = Breeder
L = Likely Breeder
T = Transient
M = Migrant
A = Accidental
* = Breeds in upland habitats

swallow (*Tachycineta bicolorn)*, and Gambel's white-crowned sparrow changed from a transient bird to a confirmed breeder, bank swallow (*Riparia riparia)*, black-billed magpie (*Pica pica)*, common raven (*Corvus corax)*, and American dipper (*Dolichonyx oryzivorus)* lost their transient bird status. At the Cranberry Hill site, black-capped chickadee changed from a likely breeder to a confirmed breeder, northern shrike lost it's transient bird status, and savannah sparrow (*Passerculus sandwichensis)* changed from a transient bird to a confirmed breeder. Although not included in landbird totals above, the common snipe (*Gallinago gallinago)* was confirmed as a breeding bird at the Mountain site, and a likely breeder at the Lake site.

Species Composition (Richness)

Almost every species believed breeding at each MAPS site was captured at least one time during the MAPS season with the exceptions of pine grosbeak and downy woodpecker (*Picoides pubecens)* (Table 2). The three MAPS sites had at least one capture for most of the same species, with the following exceptions: no tree swallows at the Mountain or Cranberry Hill sites, and no American tree sparrows at the Cranberry Hill site. Overall, the richness of the three sites is relatively consistent. Of species with twenty or more newly banded birds caught at each site, Wilson's warblers made up the largest percentage with 52%, 43%, and 60% occurring at the Lake, Mountain, and Cranberry Hill MAPS sites respectively (Table 2). The next most common species at all sites are common redpoll, orange-crowned warbler, and hermit thrush.

Habitat Structure Assessment

We mapped and described habitat types within our three study sites in conjunction with standardized MAPS data collection procedures. Each study site mapped included an extended boundary of 100 meters from all nets (Appendices I-III). Total area of distinct habitats was measured. The Mountain site was comprised of five habitat types (Appendix I): Cottonwood forest (39%), medium shrub thicket (31%), tall forbes-grass meadow (15%), tall shrub (12%), and wet sedge meadow (3%). The Lake site was comprised of four habitat types (Appendix II): Cottonwood forest (50%), tall willow scrub (31%), low shrub (19%), and dwarf shrubland (10%). The Cranberry Hill site was comprised of three habitat types (Appendix III): Cottonwwod-*Salix* woodland (74%), tall willow scrub (18%), and wet sedge meadow (8%).

<u>Color Banding and Resighting</u>

This season we continued to color band birds throughout the MAPS season at the Lake site as well as reimplementing the color banding effort at the Mountain site (discontinued after 1996 season). A total of 138 individuals were color banded including the banding of hatch year birds (not done in previous years). The species banded included 12 gray-cheeked thrushes (two HY), 55 hermit thrushes (32 HY), three American tree sparrows (three HY), 27 fox sparrows (nine HY), three Gambel's white-crowned sparrows (no HY), and 38 golden-crowned sparrows (14 HY). Twenty of these birds were returns that had only been banded with a metal band during their initial capture. Of the 138 birds color banded 72 were captured at the Mountain site and 65 were captured at the Lake site. In addition, one golden-crowned sparrow was color banded as the result of a target netting effort on the Lake site.

Of the 138 birds color banded in the 2000 season, 11 were resighted and recaptured, including the target-netted golden-crowned sparrow, 34 were only recaptured, three were only resighted, and 90 were neither recaptured nor resighted. Of birds color banded in previous years, 10 were recaptured and resighted, two were only recaptured, two were only resighted, and four birds were neither recaptured nor resighted.

Migration Banding

Capture Success

We conducted migration banding on 32 days between August 5 and September 13. Captures during migration totaled 4472 birds. New captures totaled 3760 birds (Table 2), falling short of 1999's record total of 3938 birds by only 178 (Table 3). Total net hours during migration amounted to 1533.6, approximately 13 hours less than last year's effort. The fact that this year's crew was well trained, and contained an ample number of experienced pickers and banders, helped keep nets open longer and made operation of mist nets run smoothly and efficiently without endangering the birds. Net opening strategy was based on last year's criteria with as many nets being open as we could efficiently run taking into account weather conditions, staff size, and anticipated bird numbers.

The highest capture day occurred on August 12 with 450 new captures in 30.50 net hours (capture rate of 1475.4 captures per 100 net hours). The highest capture rate occurred on August 05 with 56 new captures in 2.67 net hours (capture rate of 2097.4 captures per 100 net hours). Notable is the fact that this day was primarily a training day for the newly arriving staff, and if all nets had been opened captures would have potentially been high. Aside from this the next highest capture rate was recorded on the August 12 date mentioned previously. We also calculated capture rates of new birds and first time returns over five-day periods to dampen the effects of low net hour days. The peak five-day period this year for migration was August 9-13 (Figure 8).

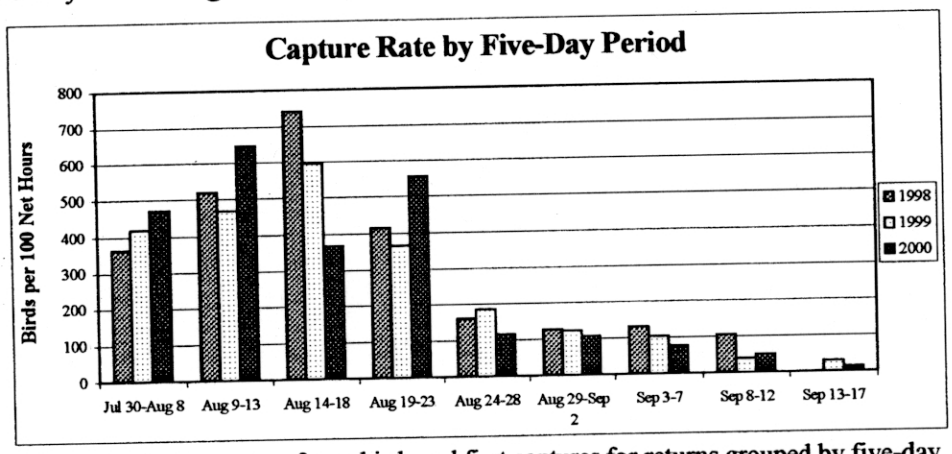

Figure 8. Capture rates of new birds and first captures for returns grouped by five-day periods during migration banding at Mother Goose Lake, Alaska Peninsula, August-September 1998-2000.

This trend in capture rates differs from 1998 and 1999 in which the highest capture rates were recorded in the period August 14-18. In 2000 migration peaks came in two separate pulses with the highest capture rates being recorded in August 9-13 and August 19-23.

Again this shows some variation relative to 1998 and 1999 in which there was a pronounced peak followed by a gradual decline in captures rate for the rest of the migratory event. The overall capture rate for all birds captured during migration was 291.21 birds per 100 net hours. We also recorded high net efficiencies per net for nets twelve, one, ten, and eleven having 805.56, 518.45, 445.56, and 336.28 captures per 100 net hours respectively (Table 4). Effort over the net array in 2000 was less variable than in 1999 and 1998. This year the coefficient of variation (CV) was 14.4% for migration. This is below 1999's CV of 22.8%, and well below 1998's CV of 58.3%. This drop in CV can be attributed to the increased training of staff members, and the overall preparedness of the crew.

Recaptures and Returns

A total of 659 recaptures comprised 14.7% of the total captures (4472) during migration. Of the 659 recaptures, six of these were new returns (see below), 428 were first time recaptures from migration, and 49 were first time recaptures from MAPS. Some birds were recaptured multiple times during the migration season. Six birds were recaptured but escaped before their band numbers could be recorded. Migration recaptures and percent recaptures are reflected in Table 8. Of all the species recaptured with a sample size greater than 10, black-capped chickadees were most likely to be recaptured with a rate of 38.9%. The second and third species with the highest recapture rates were orange-crowned warbler and hermit thrush with rates of 26.8% and 24.2% respectively. The average recapture rate of all species was 14.8%. Recapture rates may be due, in part, to foraging habits, local residency, migration strategy, and the type of habitat the nets are placed in.

Recapture rate was calculated for each net during migration. Recaptures used in this analysis correspond to birds that had both their new capture and their subsequent recaptures within the migration season. Recaptures were broken down into other day recaptures and same day recaptures. Recapture rates are displayed by net in Figure 9, as a function of distance from the banding tent, with net twelve being the closest and four the most distant net. Same day recapture rates declined steadily as a function of distance. A negative and significant correlation ($r = 0.83$, $P < .01$) was found between net distance from the banding tent and same day recapture rate. For other day recaptures there was no significant correlation ($r = .11$, $P > .05$) found between these recaptures and net distance. It was believed that there might be a high correlation between same day recaptures and the proximity of the nets to the banding tent. As seen above, this is the case. We also see that other day recaptures correspond more closely with the overall capture rates of nets and are not influenced by net distance from the banding tent.

During migration we captured six new returns from previous years (not previously captured during 2000 MAPS season). Four of these birds were returns from 1999, one was a return from 1998, and one was a return from 1995. Of these six birds, three were originally banded during migration, two were banded at the MAPS Lake site, and one was banded at the MAPS Mountain site.

Table 8. Migration banding recapture rates by species at Mother Goose Lake, Alaska Peninsula, August - September 2000.

Species	Total*	Recap**	% Recap***
Sharp-shinned Hawk	1	0	0
Downy Woodpecker	5	1	20.0
Alder Flycatcher	2	1	50.0
Black-capped Chickadee	72	28	38.9
Gray-cheeked Thrush	72	14	19.4
Hermit Thrush	314	76	24.2
American Robin	12	0	0
Ruby-crowned Kinglet	4	0	0
Northern Shrike	2	0	0
Orange-crowned Warbler	385	103	26.8
Yellow Warbler	267	21	7.9
Wilson's Warbler	2497	261	10.5
American Tree Sparrow	165	25	15.2
Lincoln's Sparrow	1	0	0
Savannah Sparrow	88	7	8.0
Fox Sparrow	155	33	21.3
Golden-crowned Sparrow	112	27	24.1
G. White-crowned Sparrow	27	4	14.8
Slate-colored Junco	1	0	0
Pine Grosbeak	1	0	0
Common Redpoll	283	58	20.5
Total	4466	659	14.8

* Total number of birds captured: unbanded, banded, and recaptured.

** Total number of birds recaptured, and returned.

*** Percentage of total birds caught that were recaptures or returns.

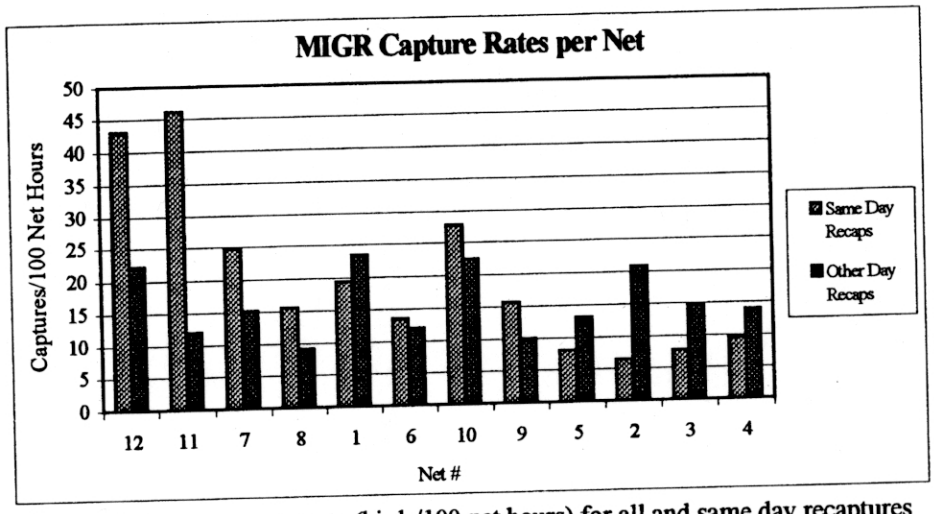

Figure 9. Per net capture rate (birds/100 net hours) for all and same day recaptures at Mother Goose Lake, Alaska Peninsula, August-September 2000.

Species Composition (Richness)

Species composition during migration was consistent to previous years' (1994-1999) with 20 different species captured (Table 2). The most notable capture was that of a hatch year Lincoln's sparrow (*Melospiza lincolnii*) constituting the first capture record at Mother Goose Lake. There were also four ruby-crowned kinglet's captured in 2000 making that the highest single year capture total since the station was established in 1994. Species amounting to only one capture were both slate-colored junco (*Junco hyemalis*) and pine grosbeak. This low capture of pine grosbeaks is a bit disconcerting. Since 1994 the overall capture of these birds has decreased considerably. Captures in the past were 11 in 1994 (Cranberry Hill site not established), 22 in 1995, 17 in 1996, 14 in 1997, two in 1998, seven in 1999, and only one this season. The reason for this decline in pine grosbeak captures is unclear; however, future observations of captures, and overall bird sightings, should be continued and examined closer if declines persist.

Mortality and Unbanded Birds

Six mortalities occurred during migration banding. A northern shrike predated one bird, one bird flew into the lake immediately after release, and one newly banded bird was recovered close to the banding tent, though cause of death was unknown. The three other mortalities were a result of normal mist-netting operations with exposure, stress, and strangulation the likely causes. No mortalities were recorded during the MAPS season making a total of six birds out of 6059 (0.1%) captures. Total mortalities by species were two Wilson's warblers and four common redpolls.

During MAPS and migration banding, 66 birds (47 during migration) were captured but not banded (unbanded category). The six mortalities are included as unbanded birds. Unbanded birds were a result of the release of a bird before banding when we felt the bird's life was threatened by further handling. This included birds that appeared weak, became wet or cold, or had a lengthy extraction from the mist net. Some unbanded birds simply escaped from handlers either at the net or in the banding tent. One notable unbanded bird was a sharp-shinned hawk (*Accipiter stiatus*) that was caught in net one on

September 5. The bird was in the net, but escaped while a staff member tried to prepare it for extraction.

During banding and nesting studies at MOGO, one female Gambel's white-crowned sparrow was detected with avian pox. Her nest was discovered and the fate followed. One egg and two nestlings were originally observed in the nest. On the second visit the one egg remained, but only one nestling was observed. This nestling was large and looked very abnormal. On the final visit all nestlings were gone, but the one egg still remained. It was determined that the nestling fledged and that the nest was a partial success. We saw the fledgling near the nest area receiving food from the male. The fledgling was very abnormal in appearance and was unable to fly. About 24 hours later the same fledgling was observed. We then captured the bird by hand. The bird was riddled with what appeared to be pox lesions, and numerous developmental abnormalities were observed on the bird's head, wings, and legs. The fledgling was sacrificed so we could send it in for analysis. The bird was sent to the United States Fish and Wildlife Service's Madison Health Lab. On July 19, Dr. David Green reported the fledgling was most likely infected with pox. The virus was in isolation. No further reports on the bird have been received at this time. Future staff members need to watch for pox while handling birds. Since pox is transferable through contact, we do not want to jeopardize the health of other birds we handle.

Off-road Point Counts

We conducted off-road point counts on six different routes around the perimeter of Mother Goose Lake. All six of the routes (Beaver Dam, Little Bay, Hellebore Hill, Lakeshore, Cranberry Circle, and Cabinless Point) were at the same locations as in 1999. All the point counts followed standard protocol, which placed the counts between June 10 and June 30 (two 10-day periods). The first priority was to conduct counts within the same 10-day period they had been conducted in the past. All point counts were completed in the designated periods. Before performing the counts each counter walked and re-flagged the route prior to the count day.

Eighteen landbirds and ten other avian species were detected on this year's counts (Table 9). The most commonly detected species (measured by frequency or number of individuals) and consistent with previous years' was Wilson's warbler. This species as well as hermit thrush, American robin, fox sparrow, common redpoll, golden-crowned sparrow were detected on all routes. Although not detected at Little Bay, the orange-crowned warbler was also commonly detected. The data from the point counts accurately reflects the species composition and abundance established by our banding data. Lower detection frequencies on some points result from variations in habitat type and thereby potentially supporting both fewer species and lower numbers. Tree swallow and gray-cheeked thrush were detected on five of the six routes. Though high numbers of glaucous-winged gulls were detected, they were not included in this discussion because most of the birds were detected from the colonies in the middle of the lake.

Table 9. Detection frequency of species during off-road point counts, Mother Goose Lake, Alaska Peninsula, June 2000. (Frequency equals the number of points that species is detected / number of points sampled.)

Species	Lakeshore 6/17/00		Beaver Dam 6/16/00		Hellebore Hill 6/26/00		Cranberry Circle 6/16/00		Little Bay 6/26/00		Cabinless Pt. 6/17/00		Total		
	Freq.	n*	Freq.	n	Freq.	n	Freq.	n	Freq.	n	Freq.	n	points	n	
Greater Scaup	0.33	11									0.08	3	5	14	14
Black Scoter											0.08	2	1	2	
Bald Eagle					0.13	1							1	1	
Sandhill Crane			0.09	2			0.08	2			0.17	2	4	6	
Greater Yellowlegs									0.10	1			1	1	
Common Snipe			0.36	3							0.08	2	5	5	
Western Sandpiper											0.08	1	1	1	
Semipalmated Plover											0.08	1	1	1	
Arctic Tern											0.08	1	1	1	
Glaucous-winged Gull	0.17	10					0.25	6	0.50	200	0.33	48	14 10	264	1
Alder Flycatcher			0.82	15			0.25	3			0.08	2	13 11	20	11
Northern Shrike									0.20	6			2	6	
Black-billed Magpie			0.09	1									1	1	
Common Raven					0.13	1	0.08	1					2	2	
Tree Swallow			0.27	3			0.33	4			0.58	12	14 10	19	12
Black-capped Chickadee	0.17	3											2	3	
Gray-cheeked Thrush	0.17	2	0.64	9			0.75	8	0.30	3	0.08	1	21 9	23	10
Hermit Thrush	0.75	10	0.45	7	0.88	10	0.82	12	0.80	20	0.50	11	52 2	70	4
American Robin	0.67	7	0.64	9	0.13	2	0.75	20	0.60	7	0.58	7	40 5	52	8
Orange-crowned Warbler	0.42	8	0.73	21	0.25	3	1.00	33			0.25	4	45 4	69	5
Yellow Warbler	0.33	6	0.82	13	0.63	15	0.33	11			0.50	11	37 10	56	7
Wilson's warbler	1.00	33	1.00	46	1.00	26	0.92	53	0.90	31	0.75	17	62 1	206	2
Savannah Sparrow			0.36	4	0.50	5	0.08	3			0.25	5	12 12	17	13
Fox Sparrow	0.42	5	0.73	12	1.00	8	0.58	8	0.30	4	0.33	4	34 8	41	9
Gambel's White-crowned Sparrow							0.25	4	0.10	1	0.17	3	6	8	
Golden-crowned Sparrow	0.25	3	0.91	17	0.75	9	0.83	15	0.50	10	0.67	10	47 3	64	6
Pine Grosbeak			0.09	1			0.17	2	0.10	1	0.17	3	6	7	
Common Redpoll	0.50	10	1.00	22	0.88	24	1.00	51	0.40	5	0.67	18	36 7	130	3
Total Points Sampled	12		11		8		12		10		12		65		

* n = number of individual birds encountered on the route.

Nest Searching

We found 96 active nests in 416.5 hours of nest searching at both the Lake and Mountains sites. At the species level, the number of Wilson's warbler nests far outnumbered all other species at 40 nests. Multiple nests found of other species included: golden-crowned sparrow (11), hermit thrush (10), orange-crowned warbler (10), yellow warbler (6), common redpoll (4), fox sparrow (3), savannah sparrow (3), Gambel's white-crowned sparrow (3), and tree swallow (2). One nest of the following species was found: black-capped chickadee, common snipe, gray-cheeked thrush, and American robin.

All nests found were continually monitored during the nesting cycle. Of the 96 nests, fledging could be confirmed at 77 nests (80.2%) (Table 10). Success rates varied among species. All species in which only one nest was found had success rates of 100%. Other species with 100% success include savannah sparrow (n=3), and tree swallow (n=2). Golden-crowned sparrow was determined to have the highest success rate of birds with a sample size greater than ten (91%, n=11), followed by Wilson's warbler (82.5%, n=40), and orange-crowned warbler (80%, n=10) (Table 10). The common redpoll was the least successful with only 25% of nests fledging (n=4). Unsuccessful nests were attributed to unknown causes (3), abandonment (6), likely predation due to evident disturbances in the nest area (7), and possibly sterile eggs (1). In two cases the fledging could not be confirmed but was expected due to absence of nestlings and no signs of disturbance.

Golden-crowned sparrows provided the earliest nest record. A nest with nestlings was found on June 11. Then on June 12 more golden-crowned sparrows and also hermit thrush nests were found. All nests located on this day were in the nestling phase. Earlier observations of nests were not recorded mostly because nest searching had not been initiated. From arrival in camp on June 5, until June 10, staff was occupied with preparing for MAPS and point counts. Warbler species nests were not found until June 20, the first being a Wilson's warbler nest found with eggs. In the first season of this intensive effort we determined that the "larger" passerines (sparrows, thrushes) were first to nest and fledge (earliest fledge June 12). This was followed by a shift in early July with the smaller passerines (warblers) nesting, and fledging (earliest fledge July 6). We determined that renesting attempts of larger passerines were likely to occur in mid-July. Evidence of this was first seen when a female hermit thrush, who had completed her first brood, was recaptured with another fully developed brood patch in mid-July. This female's second nest was eventually located; however, it was abandoned and failed. This year's information establishes a species specific breeding chronology that will help focus nest searching efforts during subsequent seasons. Next year it may be prudent to arrive in camp by mid-May, and proceed with nest searching immediately. This would give us a better chance of finding nests of larger passerines that are in the initiation phase, and yield more complete information on incubation, clutch size, and success.

One interesting aspect of this season's nest monitoring is the comparison between fledging dates from nest monitoring and the fledging dates obtained from our MAPS mist netting effort. For the most part, nest-fledging dates preceded capture dates from five to twenty nine days (Table 11). We are not sure why this may happen, but one possibility

Table 10. Summary of data collected on nesting biology of passerine species at the Lake and Mountain site stations for the Mother Goose Lake basin, Alaska Peninsula, June-August 2000.

Species	COSN	TRES	BCCH	AMRO	GCTH	HETH	OCWA	YWAR	WIWA	FOSP	SAVS	GWCS	GCSP	CORE
Nests found	1	2	1	1	1	10	10	6	40	3	3	3	11	4
First nest found w/eggs		15-Jun	5-Jul	27-Jun	17-Jun	22-Jun*	21-Jun	21-Jun	20-Jun	19-Jun	28-Jun	20-Jun	12-Jun	25-Jun
Last nest found w/eggs		15-Jun	5-Jul	27-Jun	17-Jun	17-Jul	28-Jun	30-Jun	6-Jul	28-Jun	28-Jun	5-Jul	6-Jul	4-Jul
Incubation period, days average(range)			10 n=1				12 n=1		12(12) n=2					
Nestling period, days average(range)	1 n=1		14 n=1	14 n=1	11 n=1	13 n=1	11.8(11-12) n=4	9.5(9-11) n=4	10.5(9-11 n=17	12 n=1	13 n=1	12 n=1	10.7(10-11) n=3	
First nest fledged	18-Jul	7-Jul	29-Jul	23-Jul	4-Jul	18-Jun	10-Jul	7-Jul	6-Jul	19-Jul	2-Jul	30-Jun	12-Jun	23-Jun
Last nest fledged	18-Jul	10-Jul	29-Jul	23-Jul	4-Jul	23-Jul	26-Jul	13-Jul	24-Jul	22-Jul	20-Jul	1-Jul	27-Jul	23-Jun
Clutch size, eggs average(range)			6 n=1	3 n=1	4 n=1	4 n=4	5.2(5-6) n=6	4.6(4-5) n=5	5.4(4-6) n=23	4(4) n=2	5 n=1	2.7(2-4) n=3	4(3-5) n=4	4.7(4-5) n=3
Eggs hatched/nest average(range)			6 n=1	3 n=1	4 n=1	4(3-5) n=8	4.2(0-5) n=6	4.5(3-5) n=5	5.2(4-6) n=27	4(4) n=3	4.5(4-5) n=2	1.7(0-4) n=3	3.8(2-5) n=9	1(0-3) n=4
Successful nests	1	2	1	1	1	7	8	5	33	2	3	2	10	1
Success rate	100	100	100	100	100	70	80	83	83	67	100	67	91	25
Possible double clutch						yes						yes		
Possible polygamy									yes				yes	

* First nest found with eggs was not first nest found for this species

Table 11. Initial fledging dates, and first captures of HY birds at Mother Goose Lake, Alaska Peninsula, June-July 2000.

	FLEDGING DATES			
	Banding		Nesting	
SPECIES	LAKE	MTNS	LAKE	MTNS
Hermit thrush	30-Jun	2-Jul	~18 or 19-Jun	NA
Orange-crowned warbler	23-Jul	24-Jul	~8 or 9 Jul	~8 or 9 Jul
Yellow warbler	20-Jul	11-Jul	NA	7-Jul
Wilson's warbler	20-Jul	24-Jul	~6 or 7-Jul	~6 or 7-Jul
Savannah sparrow	21-Jul	26-Jul	~14 or 15 Jul	~2 or 3 Jul
Fox sparrow	30-Jul	23-Jun	NA	~18-19 Jul
Golden-crowned sparrow	10-Jul	2-Jul	12-Jun	~15 or 16 Jun
Common redpoll	22-Jun	13-Jun	23-Jun	NA

could be that recent fledglings may not fly around enough to elicit captures in the MAPS nets. This data is very interesting since MAPS relies on HY captures to create productivity indexes for the season. It may just be a time lag we are seeing between fledging and capture, but it is still something that should be looked into. One area of further research could explore the fate of newly fledged birds and the percent eventually captured at the MAPS station where they were produced. This would help us get an idea if our MAPS nets are actually catching young birds or not.

Also noteworthy was the presence and outcome of common redpoll nests. Redpolls, in contrast to most species captured, are resident birds and usually start nesting considerably earlier than all the migrants. We caught HY redpolls in our nets before we started to find nests. We believe the nests we did find (n=4) have a higher probability of being second attempts, first attempts for birds who didn't have an earlier nest, or double clutches. Since these may be nests of inexperienced birds, or of birds who successfully fledged young earlier, any disturbance or unfavorable conditions may result in easier failures. This would be another area of investigation.

Vegetative Phenology

Vegetative analysis began on June 8 and with the exception of the first week continued on a weekly basis starting on June 12. As of June 12, 34.8% of the study species were in the vegetative phase, 30.4% were budding, and 34.8.4% were flowering. There was high degree of variation in phenology among plant species throughout the duration of the season relative to the different families represented. The willow species were primarily the first to produce fruits. This being the first year these specific species were tracked, it is not possible to establish trends relative to other years. However in future years it will be interesting to compare the chronology on a year to year basis potentially monitoring fluctuations and relating them to weather factors, and how these subsequent changes will effect the timing of nesting songbirds.

Gull Colony Monitoring

On our first visit to the colonies (boat survey, June 13) we estimated 8, 44, and 51 adult gulls on Eastern, Central, and Western Islands, respectively (Table 12). Adult gull numbers on each island increased until they peaked on July 5 and then steadily declined. On our first ground survey of the Western and Central Island colonies on June 13, we found 39 nests, out of 129, with at least one egg. We found six and three active nests on June 20 and June 27 respectively. We were unable to locate any nests with either eggs or hatchlings out of 48 nest found on July 5 (Table 12).

Glaucous-winged gulls usually produce three eggs and incubate them for 26-29 days (Baicich and Harrison 1997). Following incubation, both sexes help rear the hatchlings until first flight at 35-64 days. Because of this, the colonies at Mother Goose Lake should have substantial nesting activity until early August. In 1996, researchers banded 87 young gulls between July 6 and August 13; in 1997, 61 HY gulls were banded on July 26. In 1998 staff found no evidence of successful breeding on the two islands. In 1999 the crew was not able to locate a single live hatchling or fledgling. They found only dead chicks

Table 12. Number of adult gulls and nest contents of Gull Islands at Mother Goose Lake, Alaska Peninsula, June-August 2000.

	ADULT GULLS							
	6/13	6/20	6/27	7/5	7/18	7/29	8/8	8/16
Eastern Island	8 ± 0.8	32 ± 1.7	48 ± 7.2	91 ± 9.0	66 ± 5.3	42 ± 2.5	28 ± 2.9	0 ± 0.0
Central Island	44 ± 3.6	52 ± 1.4	56 ± 8.4	205 ± 17.8	107 ± 1.5	89 ± 5.7	89 ± 6.6	51 ± 1.2
Western Island	51 ± 2.8	147 ± 11.6	49 ± 7.1	181 ± 9.5	112 ± 2.5	76 ± 1.5	Not counted	21 ± 0.0
Number of Observers	n=5	n=4	n=3	n=3	n=3	n=3	n=4	n=4

	NEST CONTENTS			
Western Island	6/13	6/20**	6/27	7/5
3 reproductive units*	3	1	0	0
2 reproductive units	6	1	0	0
1 reproductive unit	30	4	3	0
empty nest	90	75	50	48
Total nests w/eggs or chicks	39	6	3	0
Total nests, including empty	129	81	53	48
Central Island	6/13	6/20**	6/27	7/5
3 reproductive units	0	0	0	0
2 reproductive units	3	0	0	1
1 reproductive unit	16	7	8	0
empty nest	106	65	36	37
Total nests w/eggs or chicks	19	7	8	1
Total nests, including empty	125	72	44	38

	MISCELLANEOUS OBSERVATIONS***			
Western Island	6/13	6/20**	6/27	7/5
Broken egg shells	4	4	3	1
Dead adult gulls	2	0	0	0
Gull skulls	2	0	0	0
Central Island	6/13	6/20**	6/27	7/5
Broken egg shells	7	3	2	2
Dead adult gulls	1	0	0	0
Gull skulls	0	0	0	0

* Reproductive unit is an egg, chick, or empty shell

** Data from one observer missing

*** Observations not associated with nests

and broken eggshells, even though two weeks earlier there were 90 active nests on Western and Central islands.

The data for 2000 show for the third consecutive year there has been no confirmed successful breeding of glaucous-winged gulls on either island. Mysteriously, even though we found a number of nests with one or more eggs early in the 2000 season, we found no evidence of live hatchlings on the islands at any time. In 1998 researchers suggested that the nesting failure might have been human caused, and in 1999 human disturbance, poor food availability, or increased natural predators could be factors affecting the gulls' nesting success. Unfortunately, this mystery remained unsolved this year. As in earlier years, humans, food resources, and predators are all possible causes. On June 20 we observed two adult and one juvenile bald eagle (*Haliaeetus leucocephalus)* on and around the islands, and on July 5 we found large amounts of small mammal scat on Western island. This may lend credence to the theory of increased predation causing nesting failure in the gulls; however, more evidence needs to be collected before anything can be verified. Placement of remote cameras and/or artificial (clay) eggs on the island in the future may lead to information that would help us to better understand what is happening to nesting gulls on Mother Goose Lake.

Avian Sightings

We documented 77 species of birds in the Mother Goose basin during the 2000 season (Appendix IV). No new sightings occurred in 2000. We did have two species that were not seen for a few years. Sanderlings (*Calidris alba*) were seen on September 11 down on the weatherport beach, and Aleutian terns (*Sterna aleutica*) were observed on both September 6 and September 7.

RECOMMENDATIONS

- Continue the landbird monitoring program into future years. The Mother Goose program with it's clustered MAPS station, migration banding, and six point counts is a keystone effort in the southwest Alaska region's Boreal Partner's in Flight Neotropical Landbird monitoring program. For the southwest region, it represents the only remaining MAPS station, the only migration station located in the same spot for more than three years, and six of 15 suggested point counts. It is also the only cluster of stations in the southwest region, and the only cluster operated by the U.S. Fish and Wildlife Service in Alaska. It is one of the most productive MAPS and migration stations in the state of Alaska and the Alaska/Yukon BPIF region. The station also contributes great information on an ecosystem level with its studies on small mammals, vegetation phenologies, and with its overall scientific observations in the area.

- Vegetation analysis coincident with Neotropical landbird habitat use should be used to map the Mother Goose Lake basin as a whole. Methods need to be researched and/or developed. Geographic Information Systems (GIS) technology should be employed to manage and display the resulting maps.

- Nest searching and color banding/resighting should be continued at the Lake and Mountain site and extended to Cranberry Hill. The program should continue to focus on collecting natural history information. The protocol established this year should continue, and the intensive effort put forth should be maintained in the future.

- Discontinue annual gull island monitoring, but initiate monitoring at five-year intervals. Because monitoring requires a substantial input of time, and detracts from our landbird monitoring projects, it may no longer be beneficial to monitor the islands on a yearly basis.

- Introduce an invertebrate aspect to the project. Collection and identification of the invertebrates of the area, and the collection of stomach contents of birds, could help us understand the dependence of the avian fauna on certain invertebrate species, and maybe help us correlated poor productivity to low invertebrate numbers. This however may be an intensive project and may require additional staff to accomplish.

ACKNOWLEDGMENTS

This project was funded by the US Fish and Wildlife Service Refuge Complex Wildlife Inventory monies. The fieldwork was conducted by the authors, refuge interns John Harting, Nathan Gregory, Rachel Young, and Brian Bigler, and Wildlife Biologist Susan Savage. We received invaluable assistance in the field from Fisheries Technician Jennifer Burr, volunteers Bob Blush and Julie Teskie, regional office Refuge Planner Karen Murphy, Deputy Refuge Manager Mark Koepsel, and Subsistence Biologist Ron Squibb. We also want to thank Refuge pilot Dave Cox for numerous safe transports and resupply flights throughout the season. Branch River Air charter services provided additional flights. Thanks to Maintenance worker Gary Melvin and volunteer Stephen Howard for helping open and close the camp for the season, and for all the little improvements that make life in camp more enjoyable. Last but not least, this field project would not have been possible without the support of Refuge Manager Daryle Lons, Administrative Technician Beth Marsan, and of course, the entire Refuge staff.

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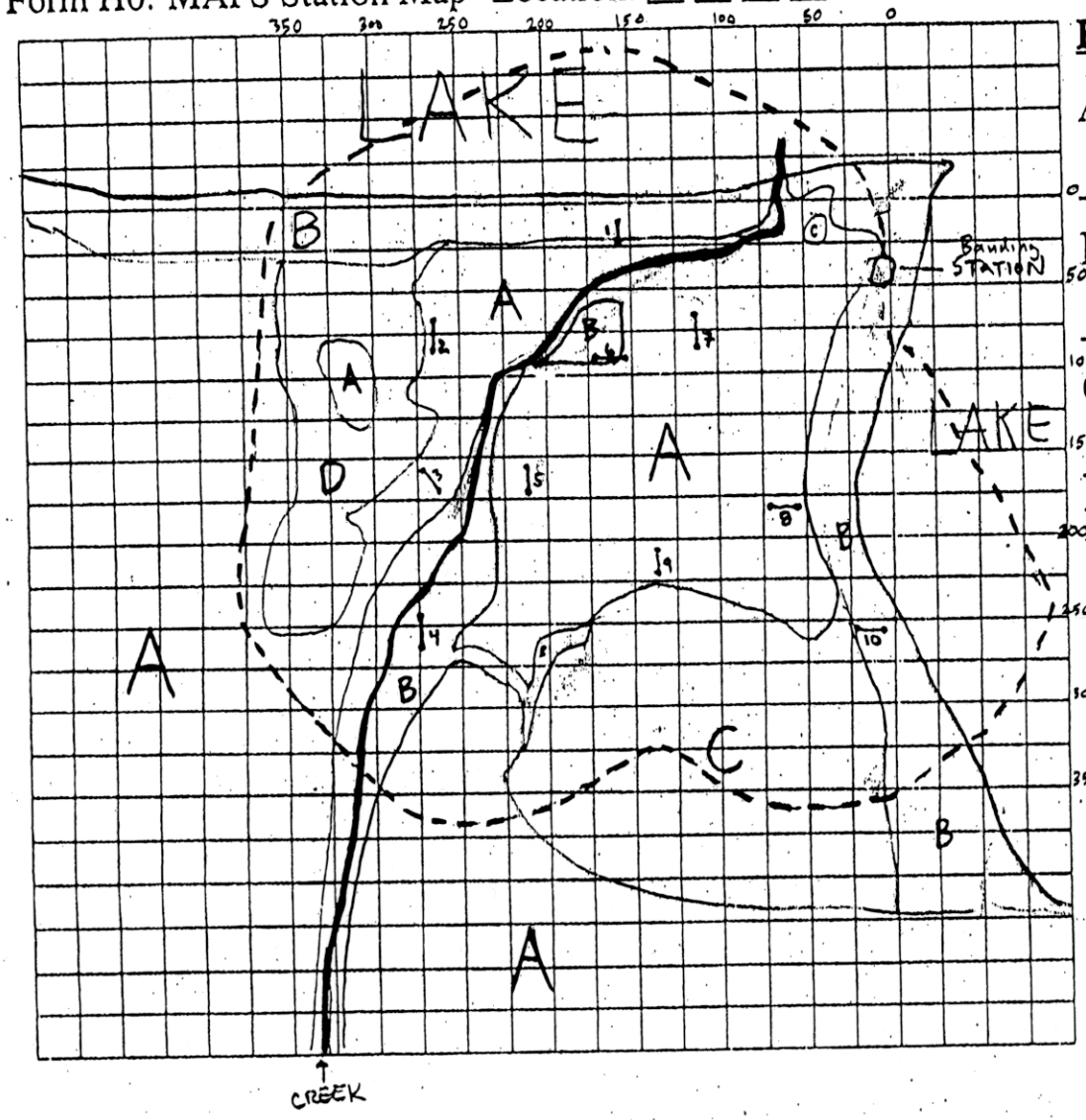
Appendix I. Habitat Structure Assessment habitat map of Lake Site, Mother Goose Lake, Alaska Peninsula, August 2000.

Form H0: MAPS Station Map Location: M O G O Station: L A K E Date: 07 / 11 / 2000



Habitat types (>=5% cover of station)

A Balsam poplar forest

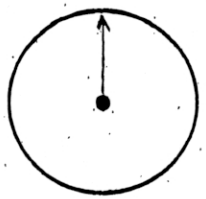
B Tall Willow Scrub

C Wet Low shrub Birch Willow

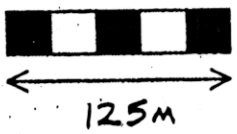
D Crowberry Dwarf – Shrubland with Willow spp.

E

Indicate North with arrow

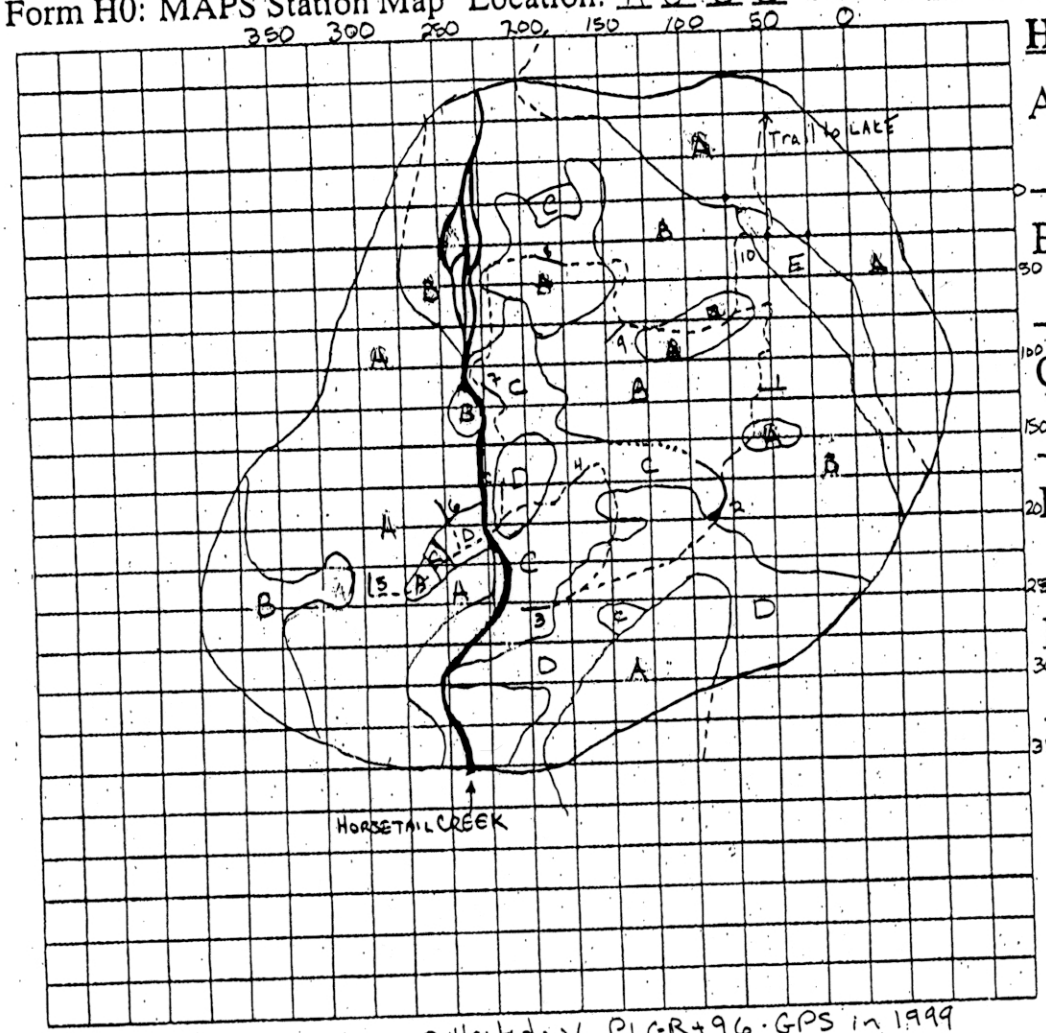


Indicate scale in meters (normally 30m per block)



Appendix II. Habitat Structure Assessment habitat map of Mountain site, Mother Goose Lake, Alaska Peninsula, August 2000.

Form H0: MAPS Station Map Location: M O G O Station: M I N S Date: 7/17/00



Habitat types (>=5% cover of station)

A Cottonwood Forest

B Tall Willow Scrub

C Tall Shrub- Salix alexensis & Alnus crispa

D Tall Forb / Grass Meadow

E Wet Sedge Meadow / Low Willow

Indicate North with arrow

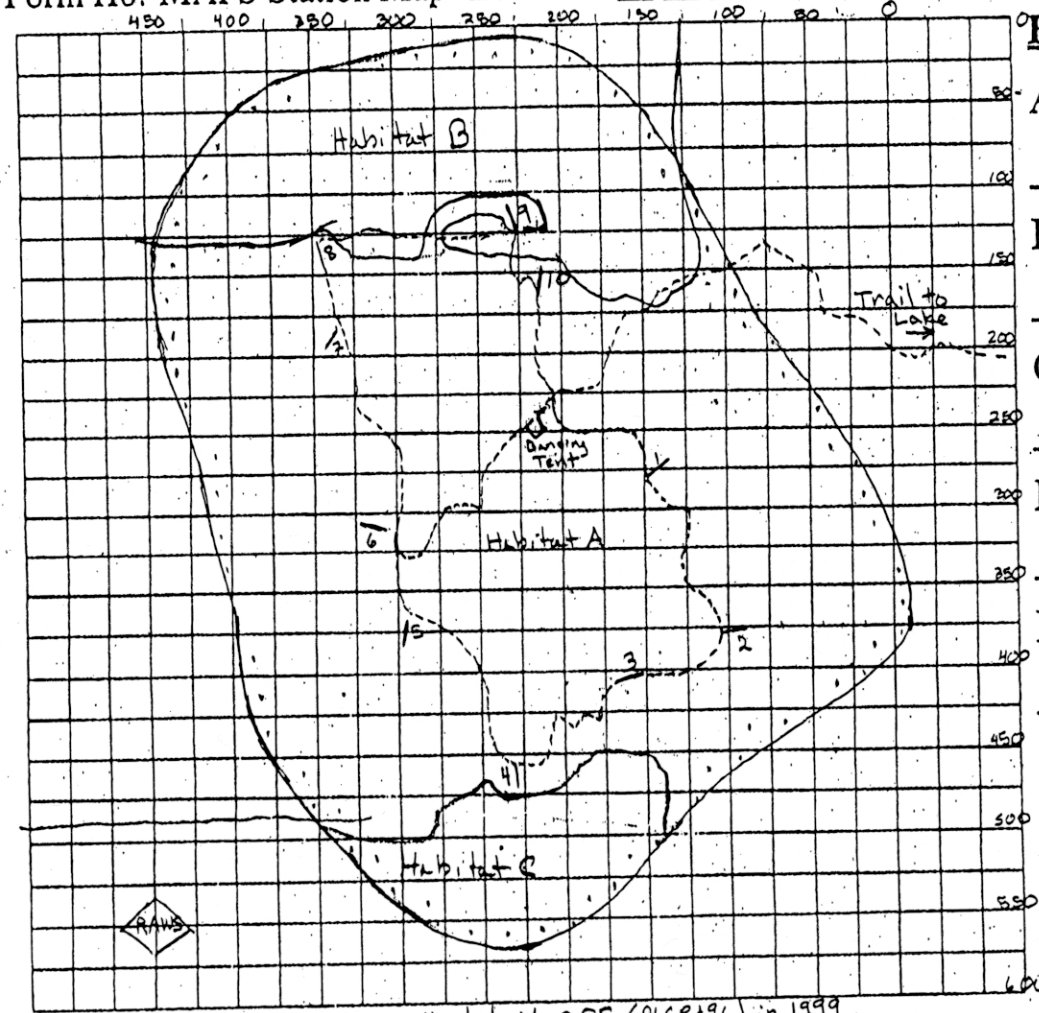
Indicate scale in meters (normally 30m per block)

125m

Trails & net locations collected w/ PLGR+96 GPS in 1999
25x25m grid flagged in 2000. Total area ~ 14.13 Hectars.

Appendix III. Habitat Structure Assessment habitat map of Cranberry Hill site, Mother Goose Lake, Alaska Peninsula, August 2000.

Form H0: MAPS Station Map Location: M O G O Station: C R A N Date: 07 / 21 / 00



Habitat types (>=5% cover of station)

A Cottonwood - Salix Woodland

B Salix - 3-4 sp. + Alder Shrub

C Wet Meadow

D

E

Indicate North with arrow

Indicate scale in meters (normally 30m per block)

125m

Trails & net locations collected w/ GPS (PLGR+96) in 1999
25x25m. grid estimated from extension of Lake grid.
~ 17.36 hectars.

Appendix IV. Avian observations at Mother Goose Lake, June - September 2000.

Species	Date First Observed	Date Last Observed	No. Days Observed	Peak Count and Dates	Breeding Status
Red Throated Loon	10-Jun	08-Sep	27	7 on 18-Aug	PO
Pacific Loon	07-Sep		1	1 on 7-Sep	O
Common Loon	8-Jun	13-Sep	72	8 on 19-Jul	PO
Red-necked Grebe	09-Jun	13-Sep	18	Common to abundant on 8-Sep	PO
Double-crested Cormorant	19-Jun	13-Sep	17	17 on 1-Aug	X
Pelagic Cormorant	31-Aug	11-Sep	10	4 on 9-Sep	O
Fork-tailed Storm-Petrel	07-Sep		1	1 on 7-Sep	O
Tundra Swan	08-Jun	13-Sep	31	13 on 11-Sep	PO
Greater White-fronted Goose	09-Jun	12-Jun	4	4 on 9-Jun and 12-Jun	PO
Emperor Goose	02-Sep	08-Sep	4	45+ on 7-Sep	O
Mallard	09-Jun	13-Sep	10	20 on 4-Sep	PO
Green-winged Teal	18-Jun	06-Aug	3	2 on 22-Jun	X
American Wigeon	08-Jun	13-Sep	13	26 on 30-Aug	PO
Northern Pintail	10-Jun	13-Sep	13	70 on 5-Sep	X
Greater Scaup	08-Jun	13-Sep	68	24 on 17-Jun, 9-Sep, and 11-Sep	CR
Common Goldeneye	10-Jul	18-Jul	3	1 on 10-July, 14-July, and 18-Jul	X
Black Scoter	08-Jun	29-Aug	18	11 on 29-Jul	CR
White-winged Scoter	10-Aug	13-Sep	2	4 on 13-Sep	X
Surf Scoter	19-Jul	13-Sep	5	20 on 13-Sep	X
Harlequin Duck	09-Jun	09-Sep	4	9 on 15-Aug	X
Red-breasted Merganser	08-Jun	13-Sep	51	25 on 21-Jul	CR
Northern Harrier	01-Jun	04-Sep	26	2 on 6-Aug	PO
Golden Eagle	22-Aug	30-Aug	2	1 on 22-Aug and 30-Aug	X
Bald Eagle	08-Jun	13-Sep	61	5 on 5-Aug	PO
Gyrfalcon	22-Aug	06-Sep	2	1 on 22-Aug and 6-Sep	X
Rough-legged Hawk	16-Aug		1	1 on 16-Aug	O
Northern Goshawk	16-Jun	09-Jul	5	1 on each day observed	X
Willow Ptarmigan	19-Jun	10-Aug	3	14 on 10-Aug	X
Sandhill Cranes	08-Jun	02-Sep	60	6 on 5-Aug	PO
Semipalmated Plover	08-Jun	11-Aug	17	17 on 29-Jun	PO
Greater Yellowlegs	11-Jun	13-Sep	52	13 on 30-Aug	PO
Wandering Tattler	8-Sep		1	1 on 8-Sep	X
Spotted Sandpiper	14-Aug	26-Aug	2	1 on 14-Aug and 26-Aug	O
Black Turnstone	08-Aug	07-Sep	9	10 on 11-Aug	X
Rock Sandpiper	07-Sep		1	1 on 7-Sep	O
Sanderling	11-Sep		1	1 on 11-Sep	O
Western Sandpiper	17-Jun	08-Sep	22	40 on 5-Aug	X
Short-billed Dowitcher	12-Aug		1	1 on 12-Aug	O
Common Snipe	09-Jun	12-Sep	49	6 on 17-Jul	CG
Red-necked Phalarope	06-Sep	07-Sep	2	1 on 6-Sep and 7-Sep	O
Arctic Tern	08-Jun	12-Aug	64	15 on 6-Jul	X
Aleutian Tern	06-Sep	07-Sep	2	12 on 6-Sep	O
Marbled Murrelet	08-Aug	13-Sep	12	5 on 4-Sep	X
Bonaparte's Gull	23-Jul	13-Sep	8	6 on 1-Sep	X
Mew Gull	11-Jun	13-Sep	64	Common 20-Aug to 9-Sep	X
Glaucous-winged Gull	9-Jun	13-Sep	77	Abundant on multiple dates due to observed colony	CE
Black-legged Kittiwake	25-Jul	13-Sep	16	51 on 6-Aug	O
Long-tailed Jaeger	20-Jun	22-Aug	2	1 on 20-Jun and 22-Aug	X
Short-eared Owl	20-Jun		1	1 on 20-Jun	X
Great Horned Owl	18-Jul		1	1 on 18-Jul	X
Belted Kingfisher	17-Jun	31-Aug	7	1 on each day observed	X
Downy Woodpecker	14-Jun	11-Sep	39	3 on 3-Aug	X
Alder Flycatcher	10-Jun	28-Aug	48	Common on 16-Jun and 17-Jun	X

Species	Date First Observed	Date Last Observed	No. Days Observed	Peak Count and Dates	Breeding Status
Northern Shrike	22-Aug	13-Sep	6	1 on each day observed	O
Black-billed Magpie	09-Jun	13-Sep	45	4 on 10-Jun	X
Common Raven	08-Jun	13-Sep	67	7 on 8-Aug	PO
Tree Swallow	08-Jun	07-Aug	55	Abundant 13-Jul to 24-Jul	CR
Violet-green Swallow	17-Jun	21-Jul	2	2 on 21-Jul	X
Bank Swallow	8-Jun	14-Aug	11	Common on 8-June, 26-Jun, 21-Jul, and 29-Jul	X
Black-capped Chickadee	08-Jun	13-Sep	90	Common on multiple dates	CR
Gray-cheeked Thrush	08-Jun	28-Aug	50	Common on multiple dates	CI
Hermit Thrush	08-Jun	13-Sep	94	Common on multiple dates	CR
American Robin	08-Jun	13-Sep	71	Common on multiple dates	CI
American Pipit	15-Aug	10-Sep	8	9 on 22-Aug	O
Orange-crowned Warbler	08-Jun	10-Sep	73	Common on multiple dates	CI
Myrtle Warbler	14-Jun		1	2 on 14-Jun	X
Yellow Warbler	08-Jun	02-Sep	62	Abundant on 8-Jun	CY
Wilson's Warbler	08-Jun	08-Sep	92	Abundant on multiple dates	CI
American Tree Sparrow	29-Jun	10-Sep	25	Common on 25-Aug	PT
Fox Sparrow	08-Jun	05-Sep	77	Common on multiple dates	CI
Savannah Sparrow	08-Jun	10-Sep	62	Common on multiple dates	CR
Gambel's White-crowned Sparrow	08-Jun	27-Aug	44	9 on 17-Jun and 26-Jun	CR
Golden-crowned Sparrow	8-Jun	13-Sep	78	Abundant on 30-Jun	CI
Slate-colored Junco	29-Aug	3-Sep	5	3 on 3-Sep	O
Snow Bunting	15-Aug	22-Aug	2	Common on 15-Aug	O
Pine Grosbeak	8-Jun	29-Aug	35	9 on 17-Jun	X
Common Redpoll	8-Jun	12-Sep	97	Abundant on multiple dates	CI

* Key to Breeding Status:

O= Observed/non-breeding
X= Observed in breeding Habitat
PO= Pair Observed
PC= Courtship
PA= Agitated Behavior
PT= Permanent Territory

CF= Carrying Food
CN= Carrying Nesting Materials
CE= Nest w/ eggs
CY= Nest with young
CR= Recently Fledged Young
CG= Precocial Young

CI= Feeding Recently Fledged Young

Mother Goose Lake 2000 Progress Report Routing List

Kent Wohl,	Migratory Bird Management, Anchorage, AK
Pat Heglund,	Division of Refuges, Anchorage, AK
Vernon Byrd,	Alaska Maritime NWR, Homer, AK
Kristine Sowl,	Izembek NWR, Cold Bay, AK
Dennis Wiefelhofer,	Kodiak NWR, Kodiak, AK
Rob MacDonald,	Togiak NWR, Dillingham, AK
Brian McCaffery,	Yukon Delta NWR, Bethel, AK
Biologist,	Yukon Flats NWR, Fairbanks, AK
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Paul Jackson,	The Nature Conservancy, Anchorage, AK
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2000 Interns and Volunteers	