Kachemak Bay Shorebird Monitoring Project; Report for 2009 Spring Survey

By

George Matz
PO Box 15182
Homer, Alaska
geomatz@alaska.net

With support from Kachemak Bay Birders

November, 2009

Table of Contents

Executive Summary

Kachemak Bay, located in Alaska's Cook Inlet region, is recognized as an important stopover for migrating shorebirds. Two areas of the Bay (Fox River Flats and Mud Bay/Mariner Park Lagoon on the Homer Spit) have been named Western Hemisphere Shorebird Reserve Network sites of international significance. Other parts of the Bay also have conservation designations. In fact, virtually the entire Bay has been named a State Critical Habitat Area as well as a National Estuarine Research Reserve unit.

Last winter, the Homer-based Kachemak Bay Birders wanted to know more about the status of the local shorebird population during spring migration. Although the Kachemak Bay Shorebird Festival has documented shorebird migrations for the past 17 years, this weekend event covers only a portion of the migratory period. Accordingly, it was decided to use volunteers to monitor the entire spring migration (mid April through late May) every five days at seven sites on or near the Homer Spit using a modified version of the International Shorebird Survey protocol. The data would then be compared to the seven years of data captured by George West from 1986 and 1989-1994 in order to provide some indication of shorebird population trends.

The weather for the 2009 spring was fairly typical for Kachemak Bay. During the monitoring project, 16 volunteers observed a total of 7,406 shorebirds represented by 25 species. No rare or accidental species were seen. Three species had counts greater than 1,000 birds; the Western Sandpiper (3229), Red-necked Phalarope (1630), and Dunlin (1097). The top ten species includes Surfbird (292), Semipalmated Plover (194), Black-bellied Plover (179), Rock Sandpiper (141), Least Sandpiper (136), Short-billed Dowitcher (125), and Black Turnstone (81). Highest counts were during the second week of May. Mud Bay was the most prolific site.

West reported that during his surveys, the "total number of shorebirds counted in Mud Bay and along the Spit averages almost 100,000 birds per year, most of which are Western Sandpipers." However, he did daily counts. Adjusting his data to match our protocol still showed a significant difference. The 2009 count for the Homer Spit sites is 68% of West's lowest year (1990) and only 13% of his highest year (1992). Obviously, there is need to continue this effort and, hopefully, to expand monitoring to other parts of the Bay.

Acknowledgements

Any study of Kachemak Bay shorebirds needs to begin with a review of the pioneering work by George West during his time in Homer, Alaska. George, who now lives in Arizona, provided me with some of his early records which were essential for making any comparisons between shorebird populations now and over the past decade or two. He also approved my use of material (Figure #1 and 6 and Table 6) from his booklet *Shorebird Guide for Kachemak Bay and Homer, Alaska*.

Michelle Michaud was the spark plug that got Kachemak Bay Birders underway. Although Kachemak Bay Birders prefers to remain an informal gathering of Homer area birders, its occasional meetings demonstrated support for undertaking this project. Without the participation of Betty Siegel, Carla and Wayne Stanley, Carol Harding, Duane Howe, Gary Lyon, Ingrid Harrald, Jason Sodergren, Karl Stoltzfus, Kim Donohue, Lani Raymond, Michelle Michaud, Neal Wagner, Rachel Lord, and Sharon Baur, this project would not have been possible. Each not only showed up to monitor shorebirds every fifth day, regardless of weather, but also contributed to the design of the project protocol.

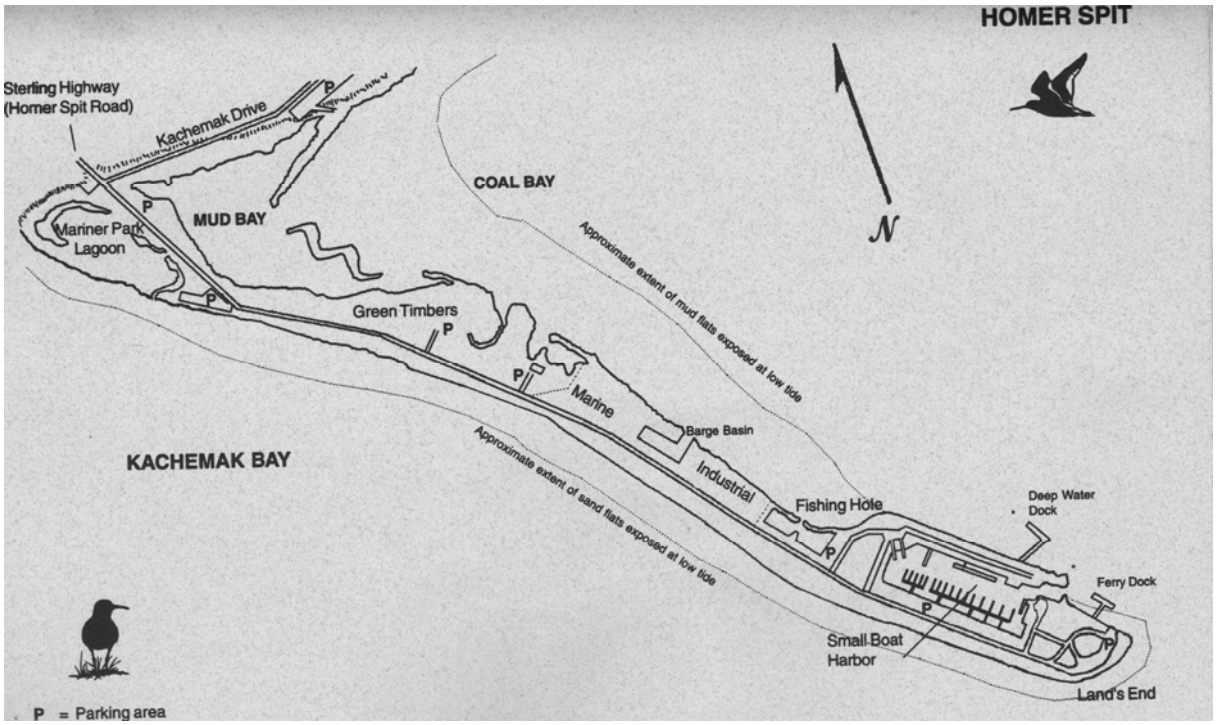
Brad Andres and Rick Lanctot, both with the U.S. F&WS, provided much needed technical advice. Dorothy Melambianakis of the Kachemak Heritage Land Trust provided the map for Figure 2. Carla Stanley took the cover photo. Credit also goes to Homer birders whose enthusiastic interest in shorebirds helps make Kachemak Bay so special.

Introduction

Kachemak Bay is a biologically rich 40 mile long, funnel-shaped fiord in the Lower Cook Inlet region of Alaska and an important stopover for migrating shorebirds. Last winter Kachemak Bay Birders, a recently formed group of birders that live in the Homer, Alaska area, wanted to know more about the status of the 36 species of shorebirds that migrate through Kachemak Bay and the Homer Spit each spring (see Appendix A for a checklist). Although Kachemak Bay Birders is not formally an organization, it was felt it could undertake a volunteer citizen science project that might provide some answers to this question.

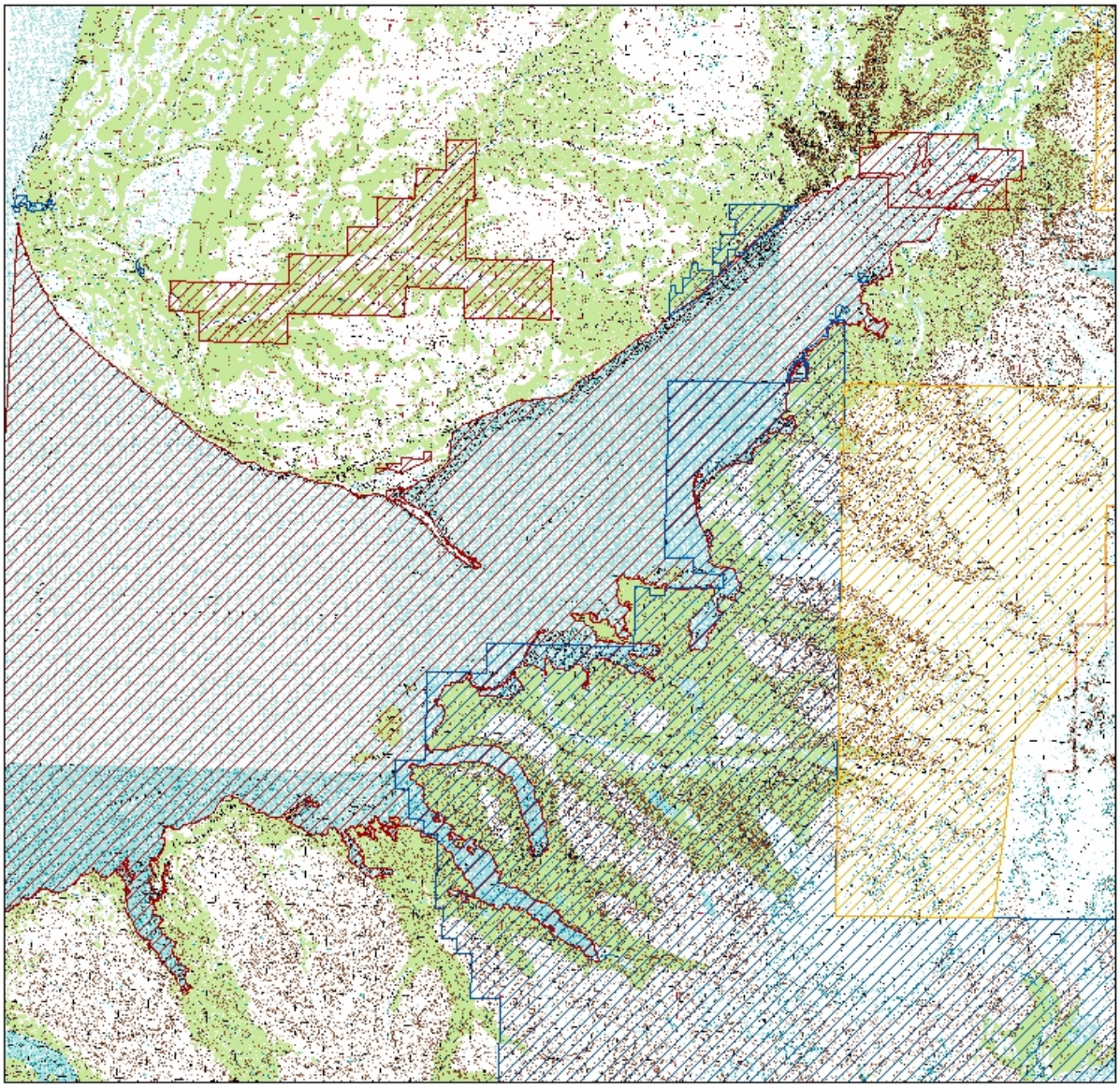
Kachemak Bay Birders were also curious as to how current populations might compare to surveys done by George C. West from 1986 to 1994 at the Homer Spit which he reported on in *Shorebird Guide for Kachemak Bay and Homer, Alaska*. The Homer Spit is a terminal moraine that juts 4.5 miles into Kachemak Bay. While the outer Spit is extensively developed with a boat harbor, fish processing plants, hotel and other tourist facilities, the base (Mud Bay and Mariner Park Lagoon) and some of the mid-section of the Spit are largely undeveloped and provide good shorebird foraging and roosting habitat.

Figure 1
Homer Spit



Kachemak Bay shorebird habitat is not only productive but, for the most part, well protected and studied. Nearly all the tidal and submerged land of Kachemak Bay has been designated both a State of Alaska Critical Habitat Area and a National Estuarine Research Reserve which, at approximately 365,000 acres, makes it the largest Reserve in the System. Also, Sixty-foot Rock, a small islet at the mouth of the Bay is part of the extensive Alaska Maritime National Wildlife Refuge, that is headquartered in Homer. On the Spit, those portions of Mariner Park Lagoon and Mud Bay that are owned by the City of Homer (approximately 160 acres) are not only zoned for either Conservation or Outdoor Space and Recreation (see Appendix B), but also included in the Western Hemisphere Shorebird Reserve Network as a site of international significance. Much

Figure 2
Map of Kachemak Bay Showing Conservation Lands



Kenai National Wildlife Refuge
State Parks
Critical Habitat Areas

Miles
0 1 2 4 6 8 10 12

The information depicted on this map is only a graphical representation of best available sources. Kachemak Heritage Land Trust assumes no responsibility for any errors on this map.

Kachemak Heritage Land Trust

of the southern shore and uplands and parts of the northern shore of the Bay are protected by the 400,000 acre Kachemak Bay State Park and State Wilderness Park. In addition, 7,100 acres of tidal flats and wetlands in the upper part of the Bay are protected by the Fox River Flats Critical Habitat Area, which is managed by the Alaska Department of Fish and Game. This CHA has also been named as a Western Hemisphere Shorebird Reserve Network site of international significance. Some of the adjoining mountainous areas are in the Kenai National Wildlife Refuge. Kachemak Bay is also considered an Important Bird Area, though this has no legal mandate. All of the agencies mentioned above are involved to some degree in scientific studies of Kachemak Bay (see Appendix C for a list of agency web sites).

Getting Started

An ad hoc committee of Kachemak Bay Birders decided that it needed to organize a citizen's science shorebird monitoring project to answer the two questions posed above. This led to a strategic planning effort last winter where the following mission, objectives and strategies were adopted.

Mission

To better understand population trends associated with migrating shorebirds that stopover in Kachemak Bay and to use this information to advance the conservation of these species both locally, nationally, and internationally.

Objectives

The objectives of this shorebird program are:

1. To monitor the status of the shorebird population that utilizes Kachemak Bay by;
    - Identifying y all shorebird species that use Kachemak Bay during spring migration,
    - Defining the seasonal period and annual timing of when shorebirds migrate through the area in the spring, and
    - Estimating the abundance and distribution of shorebirds in the Kachemak Bay area.

2. To inventory shorebird habitat throughout Kachemak Bay and assess its exposure to risks (e.g. oil spills) and what could be done to reduce risk.

3. To integrate our shorebird monitoring and habitat assessment data into resource management and development plans for the Homer Spit, Kachemak Bay, Cook Inlet, the Alaska Shorebird Conservation Plan and national shorebird conservation efforts.

4. To determine if the relatively pristine environment of Kachemak Bay, its existing protection, and its relative ease of access compared to other pristine environments in the Cook Inlet region can provide a baseline that is of use to gauge overall shorebird population trends.

Methodology

In discussing how we should go about conducting a shorebird survey we contacted Brad Andres, National Coordinator for the U.S. Fish and Wildlife Service Shorebird Conservation Plan. Brad advised using the protocol developed for the International Shorebird Survey (ISS) which uses eBird for data entry. We reviewed the protocol and made some adjustments:

1. The ISS protocol is oriented to individual effort. We planned to use a team effort to simultaneously cover several monitoring sites on the Homer Spit and nearby area. While we wanted to consider each survey collectively, each site has different characteristics. Therefore, when entering data in ISS eBird, observations from each site need to be considered as an individual trip. The monitoring coordinator, for which I volunteered, would organize each survey, collect observations from each team member, correct any problems, and then submit the data to eBird.

2. I didn't want data from the shorebird monitoring project to be comingled with my own eBird account. After some discussion with the Manomet Center for Conservation Sciences, who developed the ISS protocol, it was realized that I can enter data using more than one name.

3. The ISS protocol states that monitoring frequency should be once every 10 days. However, migrating shorebirds tend to spend less time on stopovers in Alaska than in the Lower-48. Studies of migrating shorebirds that stage in the Cooper River Delta found that migrating shorebirds stay 2 to 4 days (Warnock et al, *Birding*, "Spring Migration of Western Sandpipers, Dunlins and Dowitchers in Western North America" July/August 2005). Assuming that the Cooper River Delta is not significantly different than Kachemak Bay, a 10 day cycle would likely miss significant numbers of migrants. Consequently, the protocol for Kachemak Bay was changed to having a survey every five days.

Monitoring Sites

Although our hope is to eventually monitor the entire Kachemak Bay, this clearly was not possible this year given the transportation logistics needed to reach many parts of the Bay. So we concentrated our efforts on the Homer Spit which is easily accessible and previously studied. Thanks to the participation of a charter boat operator (Bay Excursions) who expected to be on the water when we did our surveys, we were able to include the rocky islands and islets on the south side of the Bay across from the Spit. This increased the diversity of habitat and our observations.

Following are the initial sites selected for monitoring, including the mode of observation (stationary, walking, or boat). The Diamond Creek site was dropped after the fifth survey because of lack of shorebirds. Appendix D has Goggle Earth views of each site.

1. Homer Spit - Mud Bay, stationary
2. Homer Spit - Mariner Park Lagoon, stationary
3. Homer Spit - Mid-spit including Louie's Lagoon and Green Timbers area, walking
4. Homer Spit - Outer Spit including boat harbor and Lands End, walking
5. Beluga Slough - Walking
6. Islands and Islets - Sixty-foot Rock, Cohen Island, Lancashire Rocks, and Neptune Bay, boat.
7. Diamond Creek Outlet - Walking

Survey Times:

The ad hoc committee established a policy that surveys would be done every five days, begin after April 12th of each year and be completed by June 5th. Based on previous experience, this should bracket local shorebird migration. Also, the dates selected should avoid conflict with the Kachemak Bay Shorebird Festival.

The most important factor in establishing the time to begin each survey was the tide. At lower tide, shorebirds foraging in the intertidal areas are too far away for good identification. On the other hand, at high tide when

there is less foraging opportunity, we have noticed that shorebirds often disperse and roost on spits of gravel that are not submerged.

Using the Seldovia District tables, the Kachemak Bay tide went from a low of -5.1 feet on May 26th to a high of 20.8 feet on April 10th and 26th and also on May 26th ; a range of 25.9 feet. There is a slight correction for Homer which has a high tide that is 10 minutes later and 0.2 feet higher than Seldovia, and a low tide that is 1 minute later and 0.1 feet lower, but the difference was inconsequential for our surveys.

Richard Lanctot, Shorebird Coordinator for the Alaska Region of the US Fish and Wildlife Service, recommended that monitors working adjoining sites make observations at the same time in order to minimize double-counting and assure observations under consistent environmental conditions. He also said that the longer the survey time, the more likelihood of having double-counting.

The first survey (April 16) started around high tide (7:00 am). However, monitors at the mid and end of the Spit said that there was not enough intertidal area for good access or to attract species that are likely to be in these areas (e.g., Black Turnstone). Consequently, the second survey started when the outgoing tide was at 13.0 feet, about an hour and a half after high tide. The decision to use 13.0 feet was based on this being less than the lowest high tide we will encounter during our surveys.

But this also turned out to be unsatisfactory. In Mud Bay and Louie's Lagoon the tide was too far out to provide adequate observation. It was then decided to set the starting time based on a 15.0 foot tide or at high tide if the high tide is lower than 15.0 feet. This was the best balance between having some intertidal area in the steeper areas, like the breakwater around the harbor, and closer viewing at Mud Bay and Louie's Lagoon. This also avoids setting the starting time at an extreme high tide when shorebirds tend to roost. Fortunately, we worked out the best timing before many shorebirds began to arrive.

Table 1 provides the starting times that were used as well as the respective tides.

Table 1
2009 Kachemak Bay Shorebird Monitoring Dates, Times and Tides

	Starting Time		High Tide	
Date	Time	Tide (ft.)	Time	Tide (ft.)
Thursday, April 16th	7:00 am	14.3	6:56 am	14.3
Tuesday, April 21st	2:30 pm	13.0	12:58 pm	15.0
Sunday, April 26th	6:14 pm	15.0	4:31 pm	18.7
Friday May 1st	8:45 am	15.0	7:47 am	15.9
Wednesday May 6th	3:00 pm	15.0	1:48 pm	16.7
Monday May 11th	6:15 pm	15.0	5:08 pm	16.7
Saturday May 16th	7:15 am	15.0	7:33 am	13.3
Thursday May 21st	1:30 pm	15.0	1:14 pm	15.1
Tuesday May 26th	6:45 pm	15.0	5:11 pm	18.3

We ended the surveys on May 26th because most of the shorebirds being observed were probably not migrants but breeding in the area.

Inland wetland surveys (Beluga Lake and Beluga Slough) are not be influenced by the tide and can be conducted anytime on the same day that the intertidal areas are being observed.

Monitors

Observations were made over a two hour time period. Monitors noted not only species and abundance, but also when they first observed individual birds or flocks and when these birds leave the monitoring site. The latter information allows the coordinator to eliminate duplicate counting. Monitors also noted the weather conditions and if there were any disturbances to the shorebirds by people or predators. Appendix E shows the form that was used for each survey.

We had 16 volunteers participate in the project. All are fairly experienced amateur birders and familiar with what can be expected in the Kachemak Bay area. Not all could make every survey, which is when we used substitutes. While this might not be the consistency normally desired in monitoring, we felt it was better to use experienced substitutes than to have someone missing. Since we caucused after each survey, there was opportunity to work out any uncertainies.

Table 2
2009 Volunteer Monitors

Monitoring Site	Monitors
Mud Bay - stationary	Jason Sodergren Betty Siegel
Mariners Lagoon- stationary	George Matz Carol Harding
Mid-Spit - walking	Lani Raymond Duane Howe
Boat Harbor - walking	Carla Stanley Wayne Stanley Gary Lyon
Islands and Islets	Karl Stoltzfus
Beluga Slough - walking	Ingrid Harrald Kim Donohue
Diamond Creek -walking	Neal Wagner Rachel Lord
Substitutes	Michelle Michaud Sharon Baur

Results

Weather can have a significant influence on bird migration. However, in 2009 conditions were fairly typical for Kachemak Bay and probably not a factor. Temperatures ranged from near freezing on the first survey (April 26) to the high 50s (May 11 and 26). There were sunny days, cloudy days and rain, but no big storms.

A total of 7,406 shorebirds were counted, represented by 25 species. No rare or accidental species were observed. There was little disturbance by human activity, although shorebirds sometimes took flight when an occassional airplane (usually a single engine plane) flew over the Spit after taking off from the nearby Homer Airport. There are many Bald Eagles in the Homer area and they would make an occasional but unsuccessful attempt to snatch a shorebird. We did observe one incident of a Merlin who seperated a Western Sandpiper from its flock and tried to catch it, but was unsuccessful.

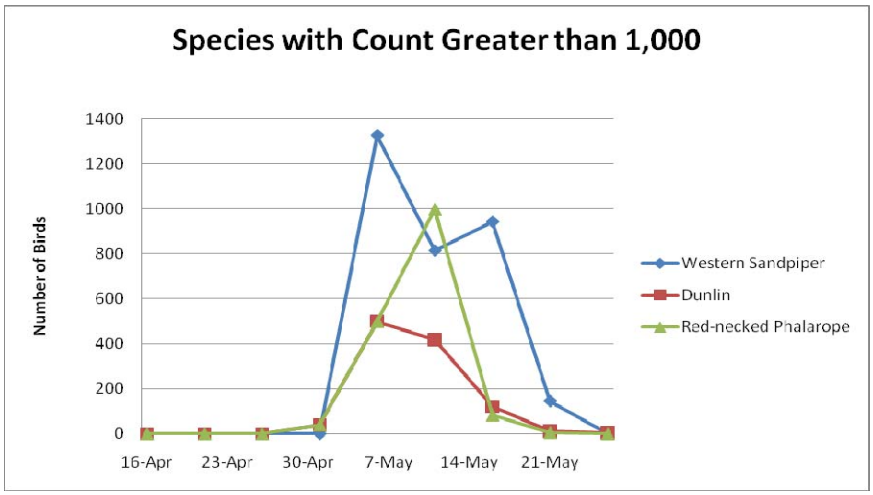
Table 3 summarizes our 2009 observations for all species and sites. A similar table for each site appears in the Appendix F. Data for each site can also be viewed via the attached Excel spreadsheets, which has more information. Some cells in the spreadsheet have tabs which provide detail such as weather conditions, incidents of disturbance, etc.

Table 3
Summary of 2009 Shorebird Observations

SITE : **Kachemak Bay Summary**										
Survey Data										
	April			**May**						
SPECIES	16	21	26	1	6	11	16	21	26	**Total**
Semipalmated Plover	0	0	0	0	15	81	34	34	30	194
Killdeer ®	0	0	0	0	0	0	0	0	0	0
American Golden-Plover (U)	0	0	0	0	0	1	2	0	0	3
Pacific Golden Plover (U)	0	1	0	0	4	0	0	0	0	5
Black-bellied Plover	0	2	5	68	37	51	14	2	0	179
Black Oystercatcher (U)	0	0	0	2	2	4	3	0	0	11
Greater Yellowlegs	5	0	1	4	2	5	5	1	1	24
Lesser Yellowlegs	0	0	0	0	0	0	0	0	0	0
Yellowlegs spp.	0	0	0	0	0	0	0	2	0	2
Spotted Sandpiper	0	0	0	0	0	0	0	0	3	3
Whimbrel	0	0	0	1	0	9	0	0	0	10
Bar-tailed Godwit (U)	0	0	0	0	0	3	0	0	0	3
Hudsonian Godwit (U)	0	0	0	0	18	0	0	0	0	18
Marbled Godwit (U)	0	0	0	0	0	1	2	0	0	3
Wandering Tattler	0	0	0	0	0	1	8	2	2	13
Surfbird	0	0	0	23	29	4	106	110	20	292
Ruddy Turnstone (U)	0	0	0	0	0	1	0	0	0	1
Black Turnstone	0	0	0	7	15	49	10	0	0	81
Western Sandpiper	0	0	0	0	1326	814	942	146	1	3229
Least Sandpiper	0	0	0	0	44	49	43	0	0	136
Semipalmated Sandpiper	0	0	0	0	0	1	0	0	0	1
LESA/WESA/SESA	0	0	0	1	103	0	0	0	0	104
Sanderling (U)	0	0	0	0	0	0	0	0	0	0
Pectoral Sandpiper	0	0	0	0	0	0	0	0	0	0
Dunlin	0	0	0	40	500	420	120	12	5	1097
Rock Sandpiper (U)	139	2	0	0	0	0	0	0	0	141
Baird's Sandpiper ®	0	0	0	0	0	0	1	0	0	1
Red Knot (U)	0	0	0	0	0	0	0	0	0	0
Short-billed Dowitcher	0	0	0	0	0	119	5	1	0	125
Long-billed Dowitcher (U)	0	0	0	0	0	0	0	0	0	0
Dowitcher spp.	0	0	0	0	65	17	17	0	0	99
Wilson's Snipe	0	0	0	0	1	0	0	0	0	1
Red-necked Phalarope	0	0	0	40	500	1000	84	6	0	1630
Total	144	5	6	186	2661	2630	1396	316	62	7406

More than a 1,000 birds were counted with three species; Western Sandpipers and Dunlin on the Spit and Red-necked Phalarope on the water. Figure 3 illustrates their coming and goings.

Figure 3



There were seven species with counts of about a hundred birds or more. Figure 3 illustrates their appearances. It should be noted that the numbers for LESA/WESA/SESA and Dowitcher spp. are not inlcuded.

Figure 4

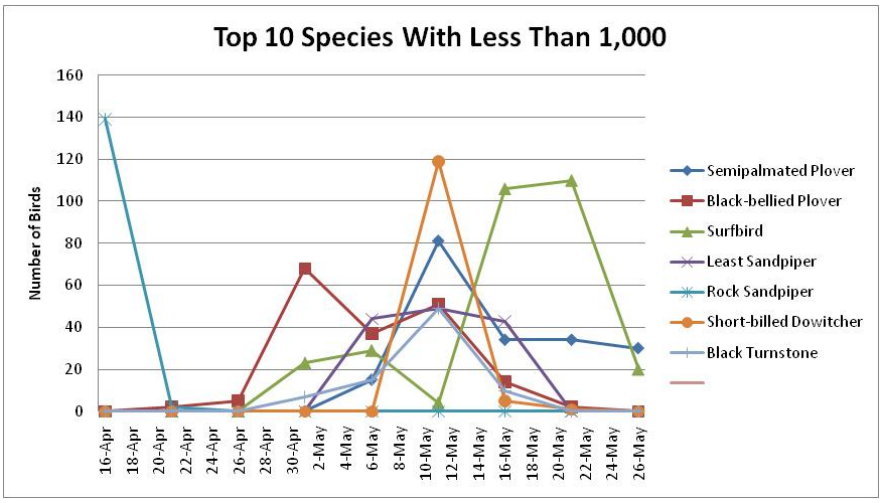


Table 4 illustrates illustrates how the number of birds (abundance) and number of species (diversity) changed from survey to survey.

Table 4

Abundance and Diversity of Shorebirds

	16-Apr	21-Apr	26-Apr	1-May	6-May	11-May	16-May	21-May	26-May	Total
Total Birds	144	5	6	186	2,661	2,630	1,396	316	62	7,406
Number of Species	2	3	2	8	13	18	15	10	7	25

Figure 5 and Table 5 illustrates abundance by monitoring site. Obviously, Mud Bay attracts more birds. In addition, with 16 species observed, it also attracted the greatest diversity.

Figure 5

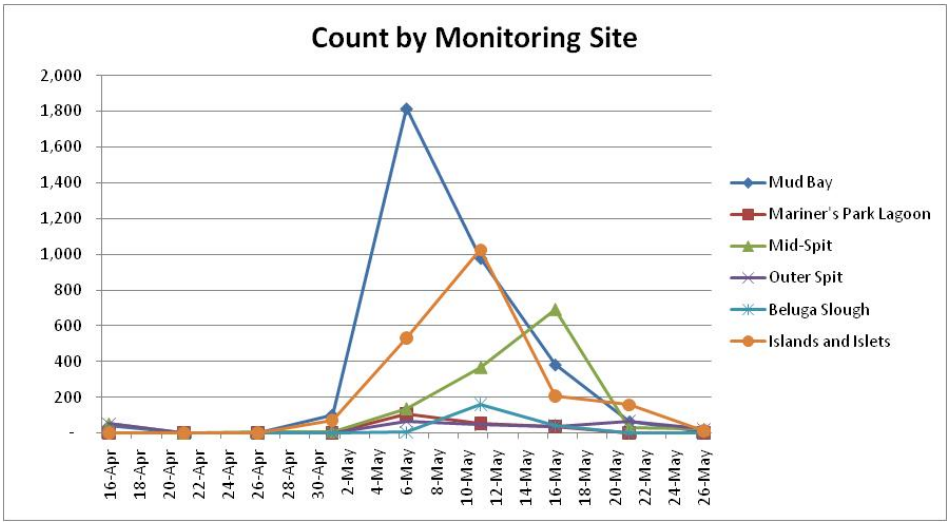


Table 5
Abundance by Site

Site	16-Apr	21-Apr	26-Apr	1-May	6-May	11-May	16-May	21-May	26-May	Total
Mud Bay	39	3	-	101	1,816	978	382	63	5	3,387
Mariner's Park Lagoon	2	-	-	1	107	55	37	2	1	205
Mid-Spit	51	-	5	8	137	369	693	29	21	1,313
Outer Spit	51	2	-	-	66	45	35	65	21	285
Beluga Slough	1	-	1	3	4	158	42	-	-	209
Islands and Islets	-	-	-	72	531	1,025	207	157	14	2,006

Was Anything Missed?

Monitoring for two hours every five days may have missed not only the short peak of the shorebird migration, but some uncommon or rare species. I visited Mud Bay daily during the peak migration and saw more shorebirds between the May 1 and May 6 survey dates than were seen during the surveys. On May 4 there were about 2,500 shorebirds in Mud Bay, about half Western Sandpiper, another half being Dunlins, and 10 Short-billed Dowitchers, 20 Black-bellied Plovers, and 1 Whimbrel.

The Kachemak Bay Shorebird Festival was held this year on May 7-10. This popular event attracts many birders who search the Homer area for all species of birds. The Festival makes an annual effort to record the species seen, but unfortunately no attempt is made at estimating abundance. Nevertheless, shorebird species seen during the Festival but not during the shorebird monitoring project includes;

1. Killdeer
2. Lesser Yellowlegs
3. Red Knot
4. Sanderling
5. Pectoral Sandpiper
6. Long-billed Dowitcher

Some of these birds were observed in areas not visited by the survey.

Past vs. Present

As previously stated, part of our effort in assessing Kachemak Bay shorebird populations was to get some understanding as to how current surveys might compare to previous surveys. The only previous data that followed any protocol that we are aware of was collected by George West when he lived in Homer. Although we now have but one year of data, the availability of West's seven years of data allows us to immediately make initial comparisons to see if there are any significant differences between now and two decades ago.

In *Shorebird Guide for Kachemak Bay and Homer, Alaska* George West says that "Counts of migrating shorebirds were made each spring for seven years (1986, 1989-1994) in Homer. Estimates, or actual counts when possible, of all shorebirds encountered in Mud Bay, Mariner Park Lagoon, and along the north side of the Homer Spit were made daily at or just after high tide from 22 April to 18 May. [Figure 4] lists the average number of individuals of each species that occurred in the count each year. The total number of shorebirds counted in Mud Bay and along the Spit averages almost 100,000 birds per year, most of which are Western Sandpipers. The number of Surfbirds is especially significant because the total world's population of this species is estimated to be near 50,000 individuals. "

While there certainly are differences from year to year in shorebird populations, the fact that we observed only about 7,400 individuals, rather than the 100,000 birds that West mentions gives us reason for concern and motive to look more closely at the data.

A review of Figure 6 below reveals an obvious factor; West surveyed every day rather than every fifth day as we did. In addition his total included every count.

In order to arrive at an apple to apples comparison, I contacted George and was able to get his data which is now on an Excel spreadsheet. Via a series of sorts and transposes I was able to make a reasonable match. What I did is use the data for the five dates that overlapped both sets of data, which turned out to be April 26, May 1,6,11, and 16. While this eliminated some data from each set, it did give a more direct comparison. Figure 7 and Table 7 provide a summary of this data. The detailed version that has the data for each date can be reviewed in the attached spreadsheet named West Data Reformatted.

Figure 6

Shorebird Migration, Homer, Alaska

Numbers per day, averaged over 7 years

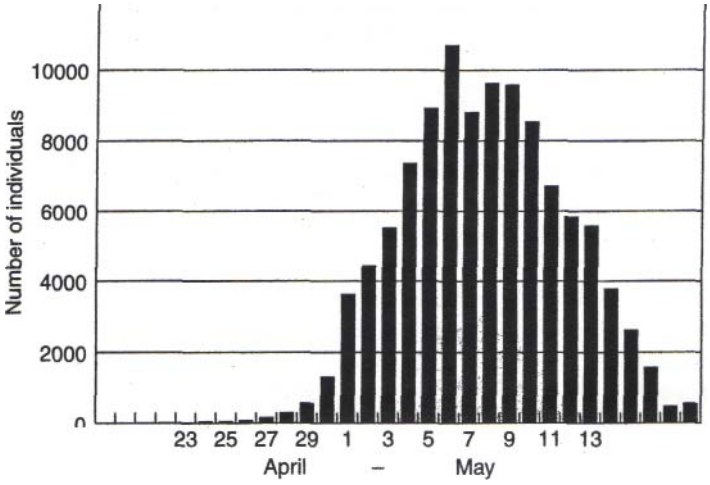


Table 6

Average Number of Shorebirds Counted in Mud Bay and on the Spit in Spring Migration April 22 to May 18 averaged over 7 years

Black-bellied Plover	877
American Golden-Plover	20
Pacific Golden-Plover	11
Semipalmated Plover	73
Wandering Tattler	6
Whimbrel	22
Bristle-thighed Curlew	1
Hudsonian Godwit	1
Bar-tailed Godwit	2
Marbled Godwit	4
Ruddy Turnstone	12
Black Turnstone	3.672
Surfbird	11.403
Red Knot	4
Sanderling	+
Semipalmated Sandpiper	2
Western Sandpiper	66.488
Least Sandpiper	71
Pectoral Sandpiper	3
Baird's Sandpiper	1
Rock Sandpiper	7
Dunlin	5.153
Dowitcher	2,494
Total Species	23
Total Individuals	90.326
Individuals/Day	4,503

Figure 7

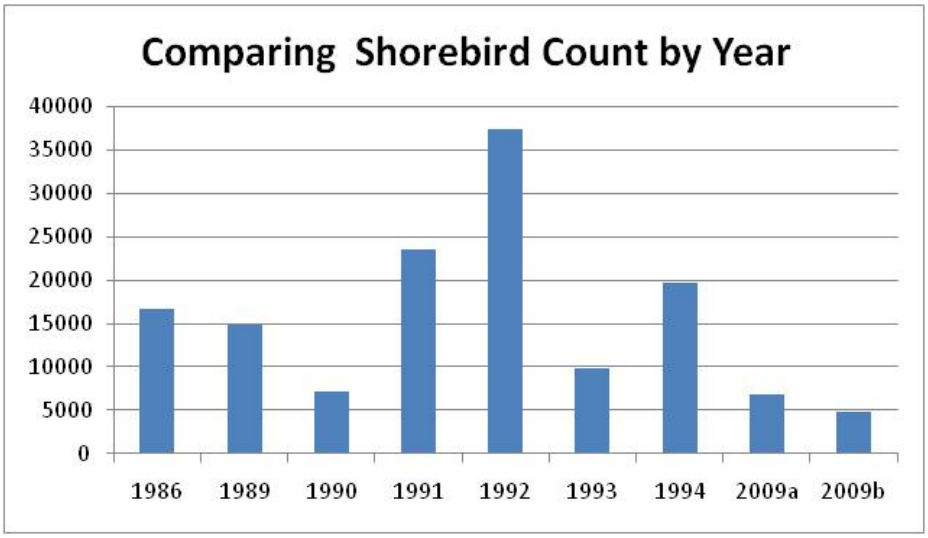


Table 7
Comparing 1986-1994 Shorebird Surveys to 2009 Survey

Comparison of West Shorebird Data (1986-1994) to Kachemak Bay Birders 2009 Data for Kachemak Bay and just Homer Spit									
Based on using five day intervals								Kachemak	Homer
								Bay	Spit
	1986	1989	1990	1991	1992	1993	1994	2009a	2009b
SPECIES									
American Golden-Plover			5	26	9		1	3	3
Baird's Sandpiper								1	1
Bar-tailed Godwit				1	2			3	3
Black Oystercatcher								11	
Black Turnstone	600	451	1,812	766	1,730	500	262	81	46
Black-bellied Plover	275	1	86	52	244	51	79	175	170
Dowitcher spp.								99	97
Dunlin	130	1,760	133	1,219	3,271	562	642	1,080	1,079
Greater Yellowlegs					17	4		17	4
Hudsonian Godwit							1	18	18
Least Sandpiper	50			2	21	2	20	136	121
LESA/WESA/SESA								104	103
Marbled Godwit		4		1	1		2	3	3
Pacific Golden Plover							7	4	4
Pectoral Sandpiper	2			1	1				
Red Knot						1	2		
Red-necked Phalarope				100			100	1,624	
Rock Sandpiper					6	2			
Ruddy Turnstone	1		3		7	1	8	1	
Semipalmated Plover	6	8	1	9	27	22	28	130	127
Semipalmated Sandpiper								1	1
Short-billed Dowitcher	600	525	58	183	1,354	325	175	124	21
Surfbird	1,000	75	3,015	602	9,980	1,200	830	162	4
Wandering Tattler				5	2	1	2	9	3
Western Sandpiper	14,000	12,000	2,010	20,510	20,725	7,200	17,469	3,082	3,025
Whimbrel				1	9	1		10	2
Wilson's Snipe								1	
Total	16,664	14,824	7,123	23,478	37,406	9,872	19,628	6,879	4,835

It is obvious that even with a better matching of data and that we not only had more observers than West but also monitored a greater area, there still are significant differences between 2009 and the late1980s and early

1990s. The 2009 count for the Spit is 68% of West's lowest year (1990) and only 13% of his highest year (1992). Needless to say, more effort is needed to hone in on the reasons.

What's Next?

Following is a first effort at a strategic plan for the Kachemak Bay Shorebird Monitoring Project for next year.

1. Monitoring - Citizen science monitoring projects can make a significant contribution to better understanding of Kachemak bay shorebirds.

- Kachemak Bay Birders plans to continue the Kachemak Bay Shorebird Monitoring Project next year. The 2009 project had no funding, but good volunteer support. Hopefully, support will continue. Since some of protocol uncertainties have been worked out, the effort should be easier.

- We should use the same protocol in 2010 as we did in 2009, but consideration should be given to having daily monitoring during peak migration, at least at Mud Bay and the Mid-Spit area, in order to fill the gaps. This depends on volunteer support.

- We should expand the area surveyed. A snap shot of spring migration for the entire Bay would be most useful. The most effective way to survey the entire Bay is by plane. Efforts are beginning to obtain funding for such a project.

- If funding for an aerial survey is not available, Kachemak Bay Birders should look into surveys during peak migration at some hot spots, like the Fox River Flats and China Poot Bay. The logistics of getting there and covering even a portion of the area will take some planning.

2. Habitat - Although the Kachemak Bay area is relatively pristine, changes have occurred; some natural some human-induced.

- The deadly 1964 earthquake abruptly changed the Cook Inlet and Prince William Sound area. The Homer Spit was lowered several feet, but is now rising due to isostatic (glacial) rebound. This may be affecting some of the beaches that shorebirds typically use. Mariner Park Lagoon for one is no longer routinely filled by high tides. While still a wetland, it may not have the abundance of marine invertebrates that it once had. A worthwhile investigation would be to determine if Mariner Park Lagoon now attracts as many shorebirds as previously.

- The shoreline mapping project done by the Kachemak Bay Research Reserve could be a valuable tool for assessing the condition of shorebird habitat throughout the Bay.

- Studies by the Kachemak Bay Research Reserve regarding marine invertebrates in intertidal areas could help identify beaches that shorebirds use for forging and should be a priority for protection in the event of an oil spill or some other emergency.

3. Planning - Kachemak Bay Birders needs to be involved in resource planning at the local, state, and national levels to assure proper recognition of Kachemak Bay shorebirds.

- Kachemak Bay Birders is using its shorebird data to participate in the recent City of Homer Spit Comprehensive Planning process. We need to seek changes where marine industrial zoning is next to conservation zoning.

- Kachemak Bay Birders have been invited to participate in the Alaska Shorebird Group meeting December 7-8 in Anchorage. We will give a short presentation on our efforts.

- The Manomet Center for Conservations Sciences has asked Kachemak Bay Birders to update the description of the Mud Bay and Fox River Western Hemisphere Shorebird Reserve Network web site. Stakeholder agencies and individuals have been contacted regarding participation. A good description of what we know about Kachemak Bay shorebirds and their habitat and the extensive science facilities in the region could help attract support for our efforts.

Appendix A

Birds of Kachemak Bay, Alaska
Checklist

Abundance

C - Common: Easily found in small to large numbers in appropriate habitat at the right time of year.

U - Uncommon: Occasionally, but not always, found in small number with some effort in appropriate habitat at the right time of year.

R - Rare: Occurs in very small numbers or in very limited number of sites and may not be found every year or even with concentrated effort. There are more than a few records of these species in appropriate habitats at the right time of year.

A - Accidental: Represents an exceptional occurrence of birds outside their normal range that might not be repeated again for decades.

Status

B - confirmed breeder

b - probable breeder

' ' - resident

sr - summer resident

wr - winter resident

m - migrant, passing through on way to summer or winter grounds, may only be found in narrow periods of time

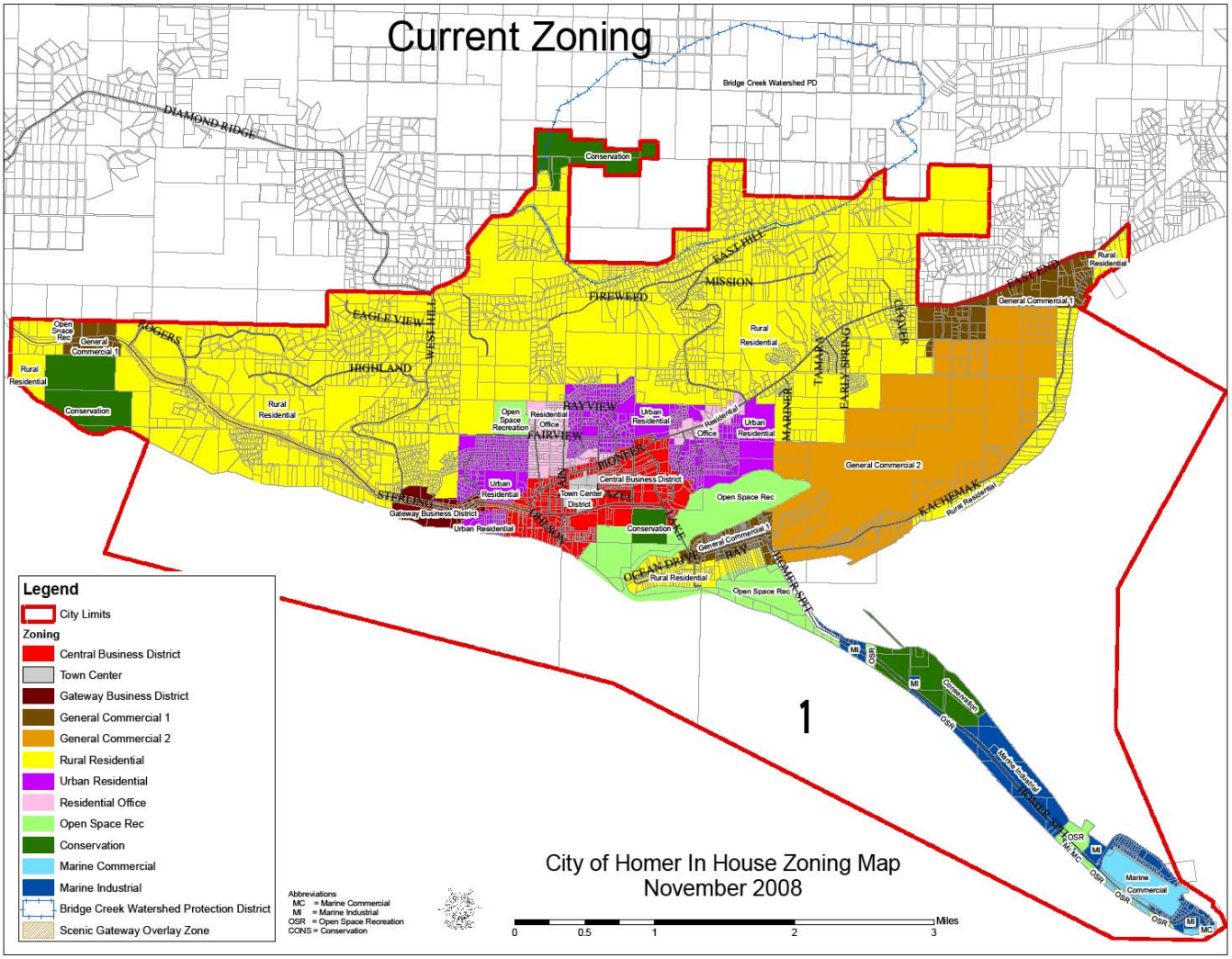
v - visitor, not on normal migration route, may stay for one day or all season

i - irruptive species whose numbers are highly variable from year to year and may not be present every year.

Species	Sp	Su	F	W	Status
Black-bellied Plover	C	C	C	-	m
American Golden-plover	U	U	U	-	m
Pacific Golden-plover	U	R	U	-	m
Semipalmated Plover	C	C	C	-	sr/m B
Black Oystercatcher	U	U	U	R	sr B
Greater Yellowlegs	C	C	C	-	sr B
Lesser Yellowlegs	C	C	C	-	sr b
Wandering Tattler	C	C	C	-	sr
Spotted Sandpiper	C	C	C	-	sr B

Whimbrel	C	C	C	-	sr/m
Hudsonian Godwit	U	A	-	-	m
Bar-tailed Godwit	U	A	A	-	m
Marbled Godwit	U	-	-	-	m
Ruddy Turnstone	U	R	R	-	m
Black Turnstone	C	U	U	-	m
Surfbird	C	C	C	-	sr/m
Red Knot	U	R	R	-	m
Sanderling	U	U	U	A	m
Semipalmated Sandpiper	C	C	C	-	m
Western Sandpiper	C	C	C	-	m
Least Sandpiper	C	U	U	-	sr/m B
Pectoral Sandpiper	C	U	C	-	m
Sharp-tailed Sandpiper	-	-	U	-	m
Rock Sandpiper	C	R	U	C	wr
Dunlin	C	U	U	R	m
Short-billed Dowitcher	C	C	C	-	m b
Long-billed Dowitcher	C	U	U	-	sr/m
Common Snipe	C	C	C	R	sr B
Red-necked Phalarope	C	C	C	-	sr B

Appendix B
City of Homer Zoning



Appendix C
Kachemak Bay Agencies and NGO's

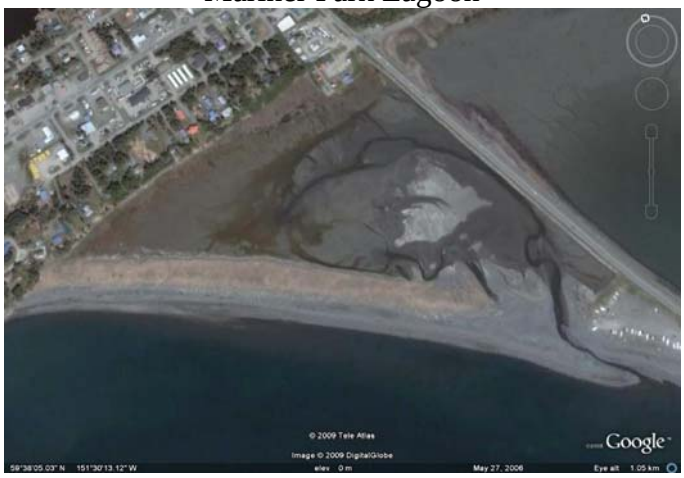
Agency and NGO Web Sites

- Alaska Shorebird Conservation Plan
  http://alaska.fws.gov/mbsp/mbm/shorebirds/plans.htm
- Alaska Maritime National Wildlife Refuge
  http://alaskamaritime.fws.gov/
- Center for Alaska Coastal Studies
  http://www.akcoastalstudies.org/
- City of Homer
  http://www.ci.homer.ak.us/
- Cook Inlet Keeper
  http://www.inletkeeper.org/
- Critical Habitat Areas managed by the Alaska Dept. of Fish & Game
  http://www.wildlife.alaska.gov/index.cfm?adfg=refuge.main
- Kachemak Bay Conservation Society
- Kachemak Bay National Estuarine Research Reserve owned by NOAA and AK Dept. of Fish & Game
  http://nerrs.noaa.gov/KachemakBay/
  http://www.habitat.adfg.state.ak.us/geninfo/kbrr/index.html
- Kachemak Bay State Park and State Wilderness Park
  http://dnr.alaska.gov/parks/units/kbay/kbay.htm
- Kachemak Heritage Land Trust
  http://www.kachemaklandtrust.org/
- Kasitsna Bay Lab - owned by NOAA and operated by the University of Alaska Fairbanks
  http://www.westnurc.uaf.edu/kbay.html
- Important Bird Area
  http://ak.audubon.org/birds-science-education/important-bird-areas-0
- International Shorebird Survey (ISS)
  www.shorebirdworld.org/
- Manomet Center for Conservation Sciences
  http://www.manomet.org/
- Western Hemisphere Shorebird Reserve Network
  http://www.whsrn.org/

Appendix D
2009 Shorebird Monitoring Sites

Mud Bay

Mariner Park Lagoon



Mid-Spit

Outer Spit

Beluga Slough

Islands and Islets

Appendix E

Kachemak Bay Birders

2009 Shorebird Monitoring Project

Site:

Date:

Name of Species	Estimate	Actual Count	Total Count & Estimate	Time Observed	Time Left Site
Semipalmated Plover					
Killdeer (R)					
American Golden-Plover (U)					
Pacific Golden Plover (U)					
Black-bellied Plover					
Black Oystercatcher (U)					
Greater Yellowlegs					
Lesser Yellowlegs					
Yellowlegs spp.					
Spotted Sandpiper					
Bristle-thighed Curlew (R)					
Whimbrel					
Bar-tailed Godwit (U)					
Hudsonian Godwit (U)					
Marbled Godwit (U)					
Wandering Tattler					
Surfbird					
Ruddy Turnstone (U)					
Black Turnstone					
Western Sandpiper					
Least Sandpiper					
Semipalmated Sandpiper					
LESA/WESA/SESA					
Sanderling (U)					
Pectoral Sandpiper					
Dunlin					
Rock Sandpiper (U)					
Stilt Sandpiper (U)					
Baird's Sandpiper (R)					
White-rumped Sandpiper (R)					
Red Knot (U)					
Red-necked Stint (R)					
Temmick's Stint (R)					
Ruff (R)					
Short-billed Dowitcher					
Long-billed Dowitcher (U)					
Dowitcher spp.					
Wilson's Snipe					
Red Phalarope (R)					
Red-necked Phalarope					
Other (specify:					

Appendix F

SITE : **Mud Bay**										
Survey Data	Stationary Count									
	April			**May**						
SPECIES	16	21	26	1	6	11	16	21	26	**Total**
Semipalmated Plover						51	2	17		70
Killdeer ®										0
American Golden-Plover (U)						1				1
Pacific Golden Plover (U)		1			4					5
Black-bellied Plover		2		60	31	9				102
Black Oystercatcher (U)										0
Greater Yellowlegs	2									2
Lesser Yellowlegs										0
Yellowlegs spp.								2		2
Spotted Sandpiper										0
Whimbrel				1		1				2
Bar-tailed Godwit (U)						3				3
Hudsonian Godwit (U)					18					18
Marbled Godwit (U)							2			2
Wandering Tattler										0
Surfbird										0
Ruddy Turnstone (U)										0
Black Turnstone										0
Western Sandpiper					1200	550	300	31		2081
Least Sandpiper										0
Semipalmated Sandpiper										0
LESA/WESA/SESA										0
Sanderling (U)										0
Pectoral Sandpiper										0
Dunlin				40	500	350	75	12	5	982
Rock Sandpiper (U)	37									37
Baird's Sandpiper ®							1			1
Red Knot (U)										0
Short-billed Dowitcher						13	2	1		16
Long-billed Dowitcher (U)										0
Dowitcher spp.					63					63
Wilson's Snipe										0
Red-necked Phalarope										0
Total	39	3	0	101	1816	978	382	63	5	3387

SITE : **Mariner's Park Lagoon**										
Survey Data	Stationary Count									
	April			**May**						
SPECIES	16	21	26	1	6	11	16	21	26	Total
Semipalmated Plover					1	11	10	1		23
Killdeer ®										0
American Golden-Plover (U)										0
Pacific Golden Plover (U)										0
Black-bellied Plover										0
Black Oystercatcher (U)										0
Greater Yellowlegs	2			1	1	1	1	1	1	8
Lesser Yellowlegs										0
Yellowlegs spp.										0
Spotted Sandpiper										0
Whimbrel										0
Bar-tailed Godwit (U)										0
Hudsonian Godwit (U)										0
Marbled Godwit (U)						1				1
Wandering Tattler										0
Surfbird										0
Ruddy Turnstone (U)										0
Black Turnstone										0
Western Sandpiper					25		26			51
Least Sandpiper					10	35				45
Semipalmated Sandpiper						1				1
LESA/WESA/SESA					70					70
Sanderling (U)										0
Pectoral Sandpiper										0
Dunlin										0
Rock Sandpiper (U)										0
Baird's Sandpiper ®										0
Red Knot (U)										0
Short-billed Dowitcher						6				6
Long-billed Dowitcher (U)										0
Dowitcher spp.										0
Wilson's Snipe										0
Red-necked Phalarope										0
Total	2	0	0	1	107	55	37	2	1	205

SITE : **Mid-Spit**	Travelling Count									
Survey Data										
	April			**May**						
SPECIES	16	21	26	1	6	11	16	21	26	Total
Semipalmated Plover					14	19	19	14	20	86
Killdeer ®										0
American Golden-Plover (U)							1			1
Pacific Golden Plover (U)										0
Black-bellied Plover			5	8	1	37	14			65
Black Oystercatcher (U)										0
Greater Yellowlegs										0
Lesser Yellowlegs										0
Yellowlegs spp.										0
Spotted Sandpiper										0
Whimbrel										0
Bar-tailed Godwit (U)										0
Hudsonian Godwit (U)										0
Marbled Godwit (U)										0
Wandering Tattler							2			2
Surfbird										0
Ruddy Turnstone (U)										0
Black Turnstone					15		2			17
Western Sandpiper					74	224	565	15	1	879
Least Sandpiper					30	3	28			61
Semipalmated Sandpiper										0
LESA/WESA/SESA					3					3
Sanderling (U)										0
Pectoral Sandpiper										0
Dunlin						69	45			114
Rock Sandpiper (U)	51									51
Baird's Sandpiper ®										0
Red Knot (U)										0
Short-billed Dowitcher										0
Long-billed Dowitcher (U)										0
Dowitcher spp.						17	17			34
Wilson's Snipe										0
Red-necked Phalarope										0
Total	51	0	5	8	137	369	693	29	21	1313

SITE : **Outer Spit**	Travelling Count									
Survey Data										
	April			**May**						
SPECIES	16	21	26	1	6	11	16	21	26	Total
Semipalmated Plover									4	4
Killdeer ®										0
American Golden-Plover (U)							1			1
Pacific Golden Plover (U)										0
Black-bellied Plover					5					5
Black Oystercatcher (U)										0
Greater Yellowlegs										0
Lesser Yellowlegs										0
Yellowlegs spp.										0
Spotted Sandpiper										0
Whimbrel										0
Bar-tailed Godwit (U)										0
Hudsonian Godwit (U)										0
Marbled Godwit (U)										0
Wandering Tattler						1			1	2
Surfbird						4		65	16	85
Ruddy Turnstone (U)										0
Black Turnstone						29				29
Western Sandpiper					27		34			61
Least Sandpiper					4	11				15
Semipalmated Sandpiper										0
LESA/WESA/SESA					30					30
Sanderling (U)										0
Pectoral Sandpiper										0
Dunlin										0
Rock Sandpiper (U)	51	2								53
Baird's Sandpiper ®										0
Red Knot (U)										0
Short-billed Dowitcher										0
Long-billed Dowitcher (U)										0
Dowitcher spp.										0
Wilson's Snipe										0
Red-necked Phalarope										0
Total	51	2	0	0	66	45	35	65	21	285

SITE : **Beluga Slough**	Travelling Count									
Survey Data										
	April			**May**						
SPECIES	16	21	26	1	6	11	16	21	26	Total
Semipalmated Plover							3			3
Killdeer ®										0
American Golden-Plover (U)										0
Pacific Golden Plover (U)										0
Black-bellied Plover					x	5				5
Black Oystercatcher (U)										0
Greater Yellowlegs	1		1	3	1	4	4			14
Lesser Yellowlegs										0
Yellowlegs spp.										0
Spotted Sandpiper										0
Whimbrel						8				8
Bar-tailed Godwit (U)										0
Hudsonian Godwit (U)										0
Marbled Godwit (U)										0
Wandering Tattler										0
Surfbird										0
Ruddy Turnstone (U)										0
Black Turnstone										0
Western Sandpiper					x	40	17			57
Least Sandpiper							15			15
Semipalmated Sandpiper										0
LESA/WESA/SESA										0
Sanderling (U)										0
Pectoral Sandpiper										0
Dunlin					x	1				1
Rock Sandpiper (U)										0
Baird's Sandpiper ®										0
Red Knot (U)										0
Short-billed Dowitcher						100	3			103
Long-billed Dowitcher (U)										0
Dowitcher spp.					2					2
Wilson's Snipe					1					1
Red-necked Phalarope										0
Total	1	0	1	3	4	158	42	0	0	209

SITE : **Islands and Islets**	Travelling Count									
Survey Data										
	April			**May**						
SPECIES	16	21	26	1	6	11	16	21	26	Total
Semipalmated Plover								2	6	8
Killdeer ®										0
American Golden-Plover (U)										0
Pacific Golden Plover (U)										0
Black-bellied Plover								2		2
Black Oystercatcher (U)				2	2	4	3			11
Greater Yellowlegs										0
Lesser Yellowlegs										0
Yellowlegs spp.										0
Spotted Sandpiper									3	3
Whimbrel										0
Bar-tailed Godwit (U)										0
Hudsonian Godwit (U)										0
Marbled Godwit (U)										0
Wandering Tattler							6	2	1	9
Surfbird				23	29		106	45	4	207
Ruddy Turnstone (U)						1				1
Black Turnstone				7		20	8			35
Western Sandpiper								100		100
Least Sandpiper										0
Semipalmated Sandpiper										0
LESA/WESA/SESA										0
Sanderling (U)										0
Pectoral Sandpiper										0
Dunlin										0
Rock Sandpiper (U)										0
Baird's Sandpiper ®										0
Red Knot (U)										0
Short-billed Dowitcher										0
Long-billed Dowitcher (U)										0
Dowitcher spp.										0
Wilson's Snipe										0
Red-necked Phalarope				40	500	1000	84	6		1630
Total	0	0	0	72	531	1025	207	157	14	2006