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The BULLETIN...

Chapel Hill Bird Club

November - December 2009

<http://chbc.carolinanature.com>

To:

Vol. 37

No. 8

Remember: No Meeting in December

Meeting: Monday, November 23, 2009

When/Where: 7:15 PM/refreshments; 7:30/Meeting
The lounge, Olin T. Binkley Baptist Church, corner of Hwy. 15-501 bypass and Willow Dr., behind University Mall, Chapel Hill.

Who/What: Dr. Rindy Anderson will be speaking on:
"Song Preferences in Female Sparrows"

Dr. Rindy Anderson, a postdoctoral research associate in the Department of Biology at Duke, is interested in behavioral ecology, sexual selection and bioacoustics. Her dissertation research addressed the male-male function of birdsong, and the reliability of song as an aggressive signal. In her postdoctoral work at Duke she has shifted focus to the study of female song preferences. Join us for a fascinating look at this topic.

Saturday Field Trips

Trips depart from Glen Lennox Shopping Center Parking lot off HWY 54 promptly at 7:30 most Saturday mornings. All skills are welcome. Trips are usually over by noon. Dress for the weather and for walking. For further details, call Doug Shadwick at 942-0479.

There will be **no Field trip** on Saturday, **Nov.28th**, the Saturday after Thanksgiving. There will be a field trip on **Dec. 5**, and **Dec. 12** will be the last trip of the year. Christmas Bird Counts will start on the 19th.

Christmas Bird Counts

- **Raleigh/Wake Co.** - Dec. 19, Saturday, contact John Connors, John.Connors@ncmail.net, (919) 755-0253 (h)
- **Durham** - Dec. 20, Sunday, contact Jeff Pippen, jspippen@duke.edu, (919) 383-8040
- **Chapel Hill** - Dec 27, Sunday, contact Will Cook, cwcook@duke.edu, (919) 382-9134
- **Jordan Lake** - Jan 3, 2010, Sunday, contact Carol Williamson, cncbrdr@yahoo.com, (919) 383-2364
- **Falls Lake** - Jan 4, 2010, Monday, contact Brian Bockhahn, cbockhahn4@earthlink.net, (919) 676-1027

For further information see the Chapel Hill Bird Club web site: <http://chbc.carolinanature.com/> The site has explanations of the procedures for folks who are new to the counts, and the count leaders can will welcome any interested people with open arms. It's fun and a terrific way to learn.

Summary of talk given at the meeting on

Oct 26, 2009 by

Rob Bierregaard

On

"Satellite Tracking of Ospreys"

by Karen Piplani
Rob Bierregaard is a visiting professor at UNC Charlotte. Rob's interests are many, including Barred Owls, and Brazilian wildlife conservation and ecology; he has recently edited a book called "Lessons from Amazonia; the Ecology and Conservation of a Fragmented Forest", with 3 other authors.
Rob's interest in Ospreys started at his home in Martha's Vineyard as a young person. There were just 2 pairs on the island at that time. Under Gus Ben David, then director of Massachusetts Audubon's Felix Neck Wildlife Center, the

population had increased to 70 pairs by 1990, with the help of the DDT ban as well. Rob took over the Osprey count in 1998.

Ospreys are remarkable birds. When they dive to catch fish, they can go 1 meter into the water. They do not seem to be very picky about the species, as long as it is food. (One of Rob's photos showed an Osprey flying off with a goldfish in its talons.)

Ospreys do not mate for life, but they **are** faithful to their nests, and to their wintering areas. Their nests are huge affairs made mainly of a complex jumble of sticks with a depression in the center. The depression is usually cushioned with vegetation. The platforms may be ten feet off the ground, or on structures tall enough to require extension ladders, plus boot spikes to reach.

Males return to their nests in the spring, and will fight for possession of it, if necessary. Females return to their usual nest, and to the same mate, if he has been successful in keeping possession of it. The nest may sit atop a tall dead pine, or a human-made platform. Rob notes that a chain-link fence gate, about 4' x 4', secured by each corner with a sturdy brace to the supporting pole makes a sturdy and long-lasting nest support.

In addition to sticks, the variety of items used in the nests may include a string of Christmas lights, or as one startled fisherman discovered when an osprey grabbed his hooked fish, a string of fishing line ending in a fishing pole dangling in the air beneath the nest. (Those were two startling pictures among the many that Rob had for us.)

In 2000 Rob began collaborating with Mark Martell, at the University of Minnesota, in his studies of Osprey Migration. At that time they used Doppler Transmitters. The old style transmitters sent data to a satellite which relayed it to a central computer. The computer would figure just the location of the bird by using the Doppler shift of the incoming data. This data was not very extensive, and the precision was not the best. The data about location was in hundreds of meters or kilometers, rather than in meters. The data was fine for tracking general migration patterns, but did not provide much further information.

The new transmitters contain a small GPS unit. They can provide hourly information about location, speed, altitude and direction. The data is downloaded every three days. Although they are more expensive than the Doppler Transmitters, download costs are lower, so that after a year and a half, the total cost is the same for GPS vs Doppler transmitters. They are solar powered and should last for three years. Having more information from migrating birds will tell us more about how long birds stop during the

journey, and for what purposes. The new transmitters will be precise enough to provide information about hunting ranges or hunting habits.

Initially, adult birds were trapped to learn about their migration patterns. Researchers often used a tame Great Horned Owl to facilitate trapping the adults. The owl is staked out near a nest, and is surrounded with fine netting. The adults usually try to attack the owl in order to protect their young, and become entrapped in the netting.

Later, the researchers wish to trap young birds, they covered the nest with a carpet of small nooses. As the birds landed, they were caught in the nooses, and were then taken from the nest, hooded and freed from the nooses. This was usually done shortly after the young have fledged, because if they waited too long, the young have may taken off and not return to the nest.

The transmitters weigh about an ounce, and are mounted like a little backpack on the osprey. There are two U-shaped metal holders protruding from each side of the transmitter. Small straps are put through each piece, are brought over the top and underneath the wing, to the front of the osprey where they are fitted and balanced, and are secured by sewing them all together at the breast. The new transmitters collect enough data, at frequent enough intervals, to allow researchers to track the hunting patterns of the ospreys.

After the young ospreys fledge, they often take "teen-age road trips" away from their natal nests. One newly fledged bird with a new transmitter, wandered from Rhode Island up to the Boston area and further north into Maine. Another went all the way to Lake Superior for a jaunt.

Ospreys migrate to warm areas for winter. West coast Ospreys go to Mexico or Central America, while Central and Eastern North American Ospreys migrate via Florida, to Cuba, then Hispaniola or South America. Young birds often migrate over 900-1300 miles of open water, perhaps because the birds have not yet learned that it is best to stay over land. By the time they make their return trip to the breeding grounds in their 3rd year, they fly over land, not large stretches of open ocean as they did when they were young. The young birds do not bother returning north for their first summer; they are too immature to breed, and seem to know to avoid a purposeless migration.

There are some wonderful maps and great information on Rob's website, www.bioweb.unccedu/bierregaard/ospreys.htm Those of you who missed this great talk can take some solace in the fact that Rob has promised us that he will give a

talk next year on the Barred Owl. Be sure to make that meeting.

2009 Chatham County Fall Bird Count

by Will Cook

The drought-created extensive mudflats at Jordan Lake made the 14th annual Chatham County Fall Migration Count on 9/19/2009 one for the record books, with five species new for the count and amazing numbers of shorebirds. The lake level was 212.4 feet above sea level, 4.2 feet below average for the count, so fortunately there were plenty of mudflats (they begin to appear at about 214 feet) and plenty of shorebirds. Shorebird numbers and diversity on the 2009 count are only surpassed by the 2007 count, which not coincidentally was the only count with a lower lake level. Away from the mudflats, several observers reported that it seemed to be a slow count day, though overall the land bird numbers were average.

We ended up with an astonishing 130 species, far, far above the average of 102.5 and shattering the previous record mark of 123 on the 2007 count. Land birds were found in near normal numbers, but since shorebirds were abundant, we counted a record total of 5575 individual birds (3537 is average). Observer effort was above average 77.5 party-hours (average 67.3), yet we still ended up with a near record number of birds per party-hour, 72 (average 54).

The mudflats drew in huge numbers of shorebirds (16 species, 839 individuals), including several less common species and rarities that had not made an appearance on the count before. The boldface highlight was our first Ruff, an immature identified by Doug Shadwick and Scott Winton in the Morgan Creek mudflats.

Four other species were also new to the count: Northern Pintail flying over the New Hope Creek arm of the lake (Will Cook's party), White Ibis at the Morgan Creek mudflats (Doug Shadwick's party), a Sora flushed up by Will Cook from thick herbaceous cover at the New Hope Creek mudflats, and a flock of American Pipits seen and heard in flight at New Hope Creek (Cook). Several other species that were new to the count in 2007 made only their second appearance: Green-winged Teal (Cook and Shadwick's parties), Merlin (Cook), Black-bellied Plover (Shadwick), Buff-breasted Sandpiper (Cook), Short-billed Dowitcher (Cook), and Wilson's Phalarope (Shadwick, Cook), and Marsh Wren (Cook, Shadwick). Other goodies found on the count include Black-crowned Night-Heron, Stilt Sandpiper, Yellow-bellied Sapsucker, "Trail's"

Flycatcher (a silent Willow/Alder), Canada Warbler, and Bobolink.

We set an incredible number of record highs, many of them for mudflats species, as you might expect: 300 Great Egret (average 104), 196 Black Vulture (29), 258 Killdeer (48), 78 Greater Yellowlegs (2), 125 Lesser Yellowlegs (15), 13 Sanderling (1), 200 Least Sandpiper (15), 28 Stilt Sandpiper (2), 20 Short-billed Dowitcher (0.2), 3 Wilson's Snipe (0.6), 480 American Crow (229), 275 Fish Crow (13), 103 Brown-headed Nuthatch (54), 2 Marsh Wren (0.1), 5 Veery (0.3), 9 Swainson's Thrush (2), 32 Northern Mockingbird (19), 114 European Starling (40), 27 Cedar Waxwing (2), 13 Rose-breasted Grosbeak (3), and 81 Brown-headed Cowbird (6). The crows were mostly in one large mixed flock feeding on the outbreaks of insects in the sedges and grasses of the New Hope Creek mudflats.

One species set a record low this year: 8 Chimney Swift (131 average). The only other remarkably low count was 75 Double-crested Cormorants (150 average).

Warblers numbers were normal, with 361 individuals (average 336), but 20 species is the highest since 2001. Teams with the highest counts: Will Cook's party of four birders, covering the eastern New Hope Creek mudflats from NC 751, came in first in both species (89, the highest team total in the history of the count) and individuals (1535). Doug Shadwick's party, covering the Morgan Creek and western New Hope Creek mudflats from Old Hope Valley Farm Road, came in second with 70 species and 901 individuals.

Effort: 21 counters in 13 parties. 77.5 party hours (63.5 foot, 6.5 car, 7.5 boat), 84 party miles (42.5 foot, 32.5 car, 9 boat). Owling 2.5 hours, 8.5 mile.

Weather: temp 64-79 F, wind NE 5-10 mph, no precip, overcast, lake level 212.4'

Thanks for your help, counters -- this was the best one yet!

Chapel Hill Bird Club Officers

President: Amalie Tuffin, amaliel@post.harvard.edu

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Vice Presidents: David & Judy Smith, davidjudysmith@verizon.net

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2009 TRIANGLE AREA FALL BIRD COUNTS

9/16 9/17 9/19

— Chatham County observer parties —

Species	FL	KL	CC	ovlp	notes	WC	MK	DL	TL	JP	DS	NS	ST	GT	AT	AU	PW	CW
Canada Goose	83	113	119			13		3		38	4				56			5
Wood Duck	2	36	10	5		7				3	5							
American Black Duck			4			4												
Mallard	8	33	25	9		12				6	16							
Blue-winged Teal			16	5		5				11	5							
Northern Pintail			4		NC	4												
Green-winged Teal			3	3	R	3					3							
Wild Turkey		39	13			12												1
Northern Bobwhite																		
Pied-billed Grebe		2	1												1			
Double-crested Cormorant	84	21	75	14		15	12	1		1	34	8		3	15			
Great Blue Heron	44	45	142	42		80	6	10		7	47	9		7	11	1	5	1
Great Egret	46	4	300	116	H	150	55	8		20	145	7		8	14		8	1
Little Blue Heron			2	1		2					1							
Green Heron			2			1												1
Black-crowned Night-Heron			1		R						1							
White Ibis			3		NC						3							
Black Vulture	49	347	196		H	8	17		4			120			13		22	12
Turkey Vulture	10	41	123			7	9	3	7	1	12	23	3	3	8	2	39	6
Osprey	10	14	10			1	2	1		1	1	2		2				
Bald Eagle 6 ad., 7 imm.	7	10	13			4		1			2	5						1
Sharp-shinned Hawk		1	3			2			1									
Cooper's Hawk	2		1						1									
Red-shouldered Hawk	7	4	19			1		5		1		2	1	1	3	2		3
Broad-winged Hawk	1																	
Red-tailed Hawk	3	7	4			1						1						2
American Kestrel		11	4								1					1	2	
Merlin			1		R	1												
Peregrine Falcon		1																
SORA			1		NC	1												
Black-bellied Plover			1		R						1							
Semipalmated Plover		1	13	2		5					10							
Killdeer	51	31	258	26	H	90	6	37		45	74	3		11	1	2	15	
Greater Yellowlegs	2		78	3	H	70		1		2	8							
Lesser Yellowlegs	2	2	125	14		90		1		14	33							1
Solitary Sandpiper		1	1												1			
Spotted Sandpiper	3		10			4	2				1			1	2			
Sanderling			13		H	8					5							
Semipalmated Sandpiper			19			2		2			15							
Western Sandpiper			17								14			3				
Least Sandpiper	5	1	200	42	H	100	21	12			108			1				
White-rumped Sandpiper			cw					cw										
Pectoral Sandpiper		1	50	12		25		1			34				1		1	
Stilt Sandpiper	1		28		H						26			2				
Buff-breasted Sandpiper			3		R	3												
RUFF			1		NC						1							
Short-billed Dowitcher			20		R,H	20												
Wilson's Snipe			3		H						3							
Wilson's Phalarope			1	1	R	1					1							
Ring-billed Gull	3	23																
Herring Gull		1																
Caspian Tern			2					cw			2							
Rock Pigeon	1	55	16				2			14								
Mourning Dove	109	153	131			12	2	5	18	2		13	1	2	5	9	21	41
Yellow-billed Cuckoo	1	1	0															
Eastern Screech-Owl			3			1												2
Great Horned Owl			1								1							
Barred Owl	1	2	3										1			1	1	
Whip-poor-will			5								5							
Chimney Swift	41	21	8		L	1			1						2			4
Ruby-throated Hummingbird	9	13	18				2		3						1	4	8	
Belted Kingfisher	8	9	10			1		3			1			1	2		2	
Red-headed Woodpecker	12	7	34			3		4		12	7			5	1	1	1	
Red-bellied Woodpecker	20	23	72			9	4		8	1	3	5	6	3	12	7	2	12
Yellow-bellied Sapsucker			1		R	1												
Downy Woodpecker	14	22	47			6	2	1	4	4	2	4	4	3	10	1	4	2
Hairy Woodpecker	5	4	9			2			2		2	1	2					
Northern Flicker	16	14	30			6		5	3	1	3	1		2	4		1	4
Pileated Woodpecker	11	12	18			2	1	3	1	1	2	1	2	2	2	1		
Eastern Wood-Pewee	18	26	25			3	1	1	3	3	3	2	1		2	1	3	2
Acadian Flycatcher		1	1						1									
"Traill's" Flycatcher			1		R	1												
Eastern Phoebe	8	9	22			2		4		1	3		1		3	2	3	3
Great Crested Flycatcher		3	3						1						2			
White-eyed Vireo	13	14	18				1		6	2	1				2	3	3	
Blue-headed Vireo			0															
Yellow-throated Vireo		4	2						2									
Red-eyed Vireo	4	12	9			1	1		4			2			1			

2009 TRIANGLE AREA FALL BIRD COUNTS

— Chatham County observer parties —

9/16 9/17 9/19

Species	FL	KL	CC	ovlp	notes	WC	MK	DL	TL	JP	DS	NS	ST	GT	AT	AU	PW	CW
Blue Jay	68	77	160			9	17	18	18	6	16	2	4	10	20	4	3	33
American Crow	139	254	480	42	H	200	23	22	24	36	79	13	5	13	53	15	26	13
Fish Crow	6	1	275	4	H	250	1	4			5	17			2			
Barn Swallow	3	4																
Carolina Chickadee	80	100	212			35	27	16	14	10	18	24	7	6	29	7	9	10
Tufted Titmouse	58	87	170			34	9	14	12	8	16	17	7	5	24	8	7	9
White-breasted Nuthatch	17	10	36			4	4	6	2	1	4	1	4	1	3	2	2	2
Brown-headed Nuthatch	25	20	103		H	10		8		7	6	12	2	11	9		32	6
Carolina Wren	81	63	166			25	23	18	9	7	9	14	5	7	23	6	6	14
House Wren	2	3	4						1	1	2							
Marsh Wren			2		R,H	1					1							
Blue-gray Gnatcatcher	13	98	34			8		3			3	17			2			1
Ruby-crowned Kinglet		1																
Eastern Bluebird	129	142	135			7	5	14	4	2	8	22	2	1	18	5	25	22
Veery	1		5		H	1								3	1			
Swainson's Thrush			9		H	1							8					
Wood Thrush	1		13		H	1			1			1	10					
American Robin	148	27	66					5	26		6				29			
Gray Catbird	25	6	25			2	2		9	1		2			6		2	1
Northern Mockingbird	40	21	32		H	2	8	2	1		1	2	2		4	8	2	
Brown Thrasher	12	8	8			3		1			1				1			2
European Starling	160	130	114		H	4						1					34	75
American Pipit			6		NC	6												
Cedar Waxwing	5	7	27		H				27									
Blue-winged Warbler		2	2						1									1
Tennessee Warbler			1			1												
Nashville Warbler	2																	
Northern Parula	2	15	10			6						1					3	
Yellow Warbler		3																
Chestnut-sided Warbler		3	1			1												
Magnolia Warbler	4	3	7			2		1	1					1	1		1	
Cape May Warbler	1	1	2					2										
Black-throated Blue Warbler	1		7						3			4						
Black-throated Green Warbler		5																
Blackburnian Warbler		1	1									1						
Yellow-throated Warbler		4	3			1						1						1
Pine Warbler	129	114	237			20		25	4	14	16	56	4	26	38	1	26	7
Prairie Warbler	1	2	1					1										
Palm Warbler	1	2	5			1					3				1			
Black-and-white Warbler	7	18	10			2	1			1				1	1		4	
American Redstart	23	41	35			6		2	7			7	6	1	2		4	
Prothonotary Warbler	1																	
Ovenbird	2		1							1								
Northern Waterthrush	1		4			2				2								
Common Yellowthroat	22	35	31			3	3		4	1	17			1		2		
Hooded Warbler		2	1									1						
Wilson's Warbler		1																
Canada Warbler	1		1		R	1												
Yellow-breasted Chat		1	1						1									
Summer Tanager	10	26	24			3	2	1	7	1	1	1	1	1		1	5	
Scarlet Tanager		4	18			3			2	1		6	2	1	3			
Eastern Towhee	4	11	34			2	8	5	2	1	3				9		1	3
Song Sparrow	3	1	1												1			
Chipping Sparrow	60	122	21				3	2							5			11
Field Sparrow	7	52	4								4							
Northern Cardinal	45	71	148			8	24	8	22	9	6	10	5	4	10	21	10	11
Rose-breasted Grosbeak	2	5	13		H	1			3	1	1	4	2					1
Blue Grosbeak	4	12	28			10			4	4	8				1		1	
Indigo Bunting	17	61	52			40			1		11							
Bobolink			4		R	1					3							
Red-winged Blackbird		2	25															25
Eastern Meadowlark		2	0															
Common Grackle			32													19		13
Brown-headed Cowbird		12	81		H		1	80										
Baltimore Oriole	2	8	1									1						
House Finch	9	20	9						4						2		3	
American Goldfinch	79	149	207			15	34	15	38	15	4	1	2		24	12	44	3
House Sparrow		3	5				5											
TOTAL SPECIES 143	85	98	130		H	89	37	49	46	45	70	45	28	35	54	29	47	34
TOTAL INDIVIDUALS	2167	3067	5575		H	1535	346	386	321	321	901	448	100	153	497	149	399	360

CC = Chatham County fall bird count totals, FL = Falls Lake, KL = Kerr Lake
 Notes: H = Record High, L = Record Low, NC = New to Count, R = Rare

Weather: temp 64-79F, wind NE 5-10 mph, no precip, overcast, lake level 212.4'
 ovlp = estimated overlap (birds counted by 2 parties)

Start 530 745 800 700 645 730 615 700 900 745 600 530 800
 End 1915 1700 1200 1430 1915 1130 1530 1800 1400 1230 1900 1300 1245

2009 TRIANGLE AREA FALL BIRD COUNTS

— Chatham County observer parties —

Species	9/16	9/17	9/19																
	FL	KL	CC	ovlp	notes	WC	MK	DL	TL	JP	DS	NS	ST	GT	AT	AU	PW	CW	
Parties		4	6	13		1	1	1	1	1	1	1	1	1	1	1	1	1	
Individuals		5	10	21		4	1	1	1	2	2	2	1	2	1	1	1	2	
Regular Party Hours: Total		33	53	77.5		9.25	4	7	9.25	4	8.75	3.5	4	5	4.75	7	6	5	
Party Hours: On Foot		30.25	34.25	63.5		9.25	3.75		8.75	4	8.75	3.25	4		4.75	7	5	5	
Party Hours: By Car		2.75	18.75	6.5			0.25	4.5	0.5			0.25					1		
Party Hours: By Boat				7.5				2.5						5					
Party Miles: Total		53	112.9	84		9.25	6	12	12	3	8	2	1	6	2.75	2	15	5	
Party Miles: On Foot		23.5	27.5	42.5		9.25	3		2.5	3	8	1	1		2.75	2	5	5	
Party Miles: By Car		29.5	85.4	32.5			3	9	9.5			1					10		
Party Miles: By Boat				9				3						6					
Owling Hours		1.5		2.5												1	1.5		
Owling Miles		1.5		8.5												0.5	8		

Area

751 bridge west, NH Creek mudflats
 Farrington Point, Farrington Village
 White Oak Creek by kayak
 Bynum Ridge area
 751 bridge east, O'Kelly Chapel Rd
 Old Hope Valley Farm Rd., NH and Morgan Creek mudflats
 Ebenezer Point
 Boothe Hill Rd.
 Beaver Creek by kayak
 Big Woods Road
 Jay Shambley Rd, Rocky River, etc.
 Hank's Chapel Road
 Tody Goodwin Road

Party Party Members

WC Will Cook, Carl Rothfels, Roger Rittmaster, Marci Lew
 MK Mark Kosiewski
 DL Dave Lenat
 TL Terry Logue
 JP Jeff Phippen, Ricky Davis
 DS Doug Shadwick, Scott Winton
 NS Nathan Swick, Greg Swick
 ST Shelley Theye
 GT Ginger Travis, Norm Budnitz
 AT Amalie Tuffin
 AU Andy Upshaw
 PW Phil Warren
 CW Carol Williamson, Jennifer Maher

Past Counts

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	avg
Date	9/21	9/20	9/19	9/18	9/16	9/15	9/21	9/20	9/18	9/17	9/16	9/15	9/20	9/19	
Species	84	99	107	115	107	103	95	98	96	114	98	123	94	130	104.5
Birds	1584	3125	3805	4609	3887	4895	3471	3381	2256	3728	4037	4599	2597	5575	3682.1
Parties	7	10	12	13	13	17	9	13	10	11	12	11	9	13	11.4
Counters	13	14	19	27	23	37	14	17	12	18	17	22	21	21	19.6
Party Hours	31.25	54	70	86.7	88.25	132	53.75	67.25	42.3	68.5	66.2	62.7	51.5	77.5	68.0
Birds per Hour	50.69	57.87	54.36	53.16	44.05	37.08	64.58	50.28	53.33	54.42	60.98	73.35	50.43	71.94	55.5

Warblers

species	14	18	16	23	21	22	18	19	14	17	17	17	18	20	18.1
individuals	142	295	433	570	505	411	340	208	120	294	285	342	422	361	337.7
non-Pine individuals	105	108	111	293	125	187	136	130	36	111	79	136	149	124	130.7

Shorebirds

species	2	5	12	5	3	3	1	2	6	11	2	20	1	16	6.4
individuals	14	47	187	26	16	9	30	19	20	298	5	940	26	839	176.9
non-Killdeer individuals	1	23	58	4	3	4	0	1	12	131	2	757	0	581	112.6
lake level	224	214.7	213.9	223.5	216.2	216.2	214	217.1	216.4	213.8	217	211.9	217.2	212.4	216.3

Shorebirds vs Lake Level

