

Delaware Bay Shorebird Monitoring Program

2003 Field Season Summary



Kimberly Cole and Rachael Coffey

What are we doing here today?

In May-June 2003,

We came (along with the shorebirds)

We saw (and felt – a lot of cold rain)

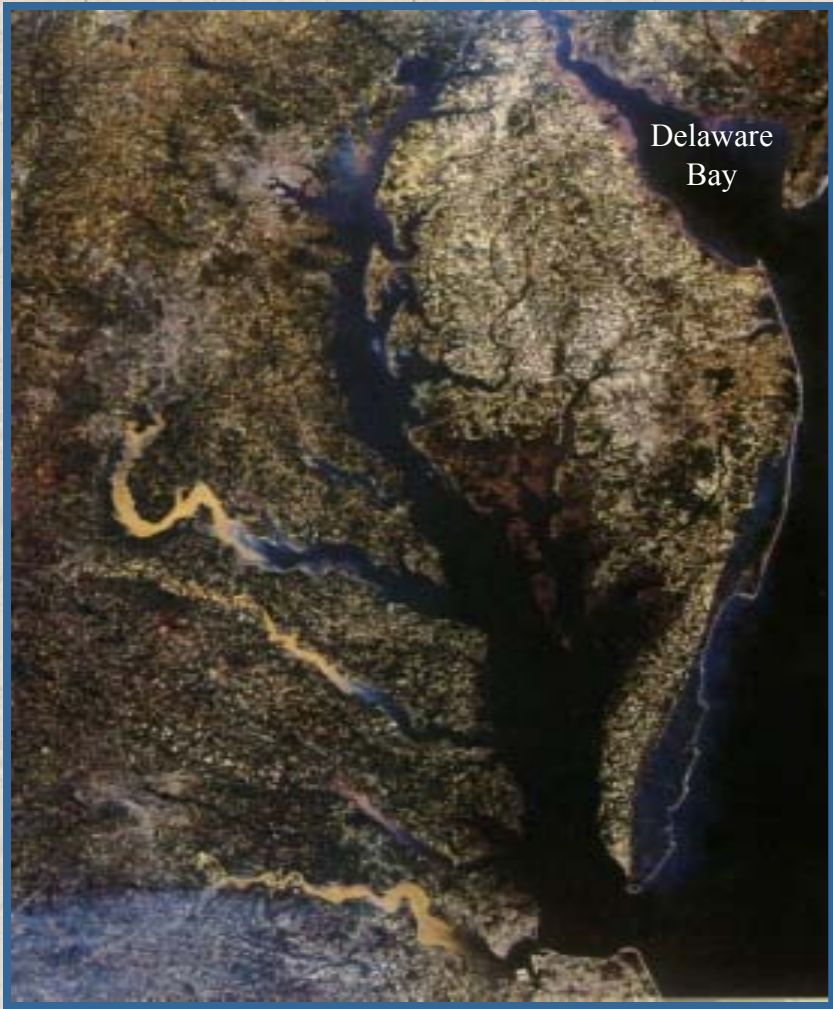
We counted and banded!!

Now we're going to go over what happened!!



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So, What makes Delaware Bay so important for shorebirds?

That would be the Horseshoe Crabs!

In late April, the first horseshoe crabs begin appearing on sandy shorelines of Delaware Bay to lay eggs. By mid-May when shorebirds are arriving in force, a green sheen of eggs are available for the eating.



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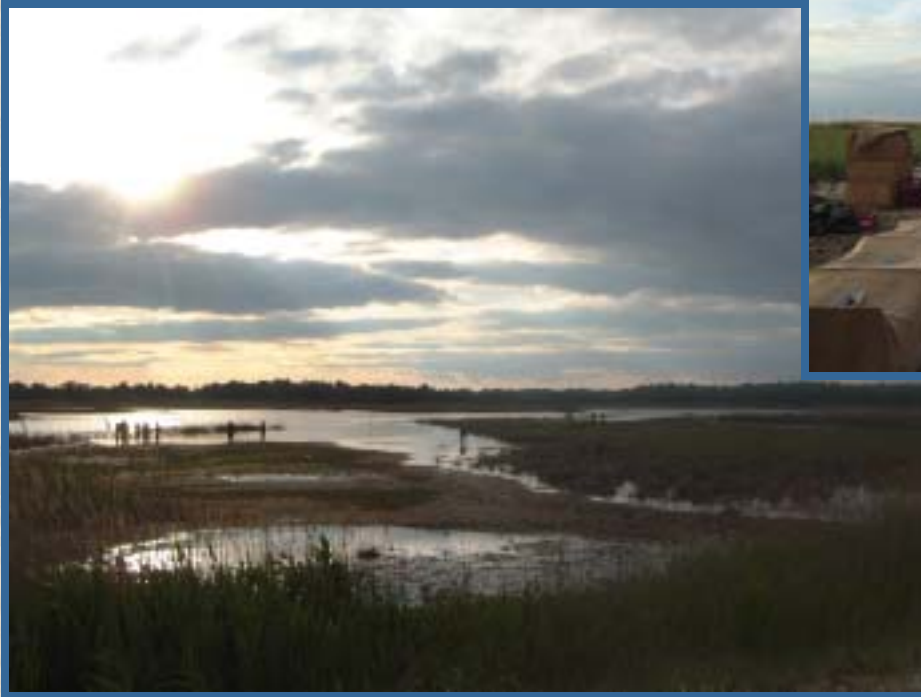
Port Mahon



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Ted Harvey W.A.



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Bowers Beach



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Brockenbridge Gut



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Mispillion Harbor



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Slaughter Beach



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Delaware Bay Shorebird Species Quiz!!!



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More Delaware Bay Shorebirds



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Shorebird Studies



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Delaware Shorebird Monitoring Team

Consists of dedicated trained volunteers (**THAT'S YOU!**), state and federal staff, and researchers with the Delaware Department of Natural Resources and Environmental Control, the British Trust for Ornithology and the Wash Wader Ringing Group, monitors the health of migrant shorebirds passing through Delaware Bay each spring.



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Research Projects for 2003

- ✧ Shorebird Banding and Processing
- ✧ Shorebird Surveys & Scanning
- ✧ Shorebird Movement and Disturbance Studies
- ✧ Understanding the Migration of Different Populations of Shorebirds passing through Delaware Bay A Pilot Study using Stable Isotopes
- ✧ Behavioral Based Modeling – Prediction of the Food Supply Needed by Shorebirds
- ✧ Influenza Viruses in Gulls, Terns, and Shorebirds of the United States Atlantic and Gulf Coasts



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Shorebird Banding and Processing



2003 Shorebird Catch Summary

For the last seven years, cannon netting has been the method utilized in Delaware Bay to catch the large number of shorebirds needed for monitoring efforts. With the overall objective of expanding the standard shorebird monitoring methods utilized by the Delaware team, mist netting efforts were also incorporated into the 2002 effort. And **NEW** in 2003 we introduced **walk-in trapping**.

In total, 10 cannon net, 3 mist net and 6 walk-in catches were made on Mispillion, Slaughter Beach, Port Mahon, Brockenbridge Gut, Cedar Creek and Ted Harvey Wildlife Area.

Date	Location	Method
12-May	Mispillion	Cannon Net
14-May	Mispillion	Cannon Net
14-May	Ted Harvey	Mist Net
17-May	Ted Harvey	Mist Net
18-May	Slaughter	Cannon Net
20-May	Brockenbridge Gut	Walk-in trap
21-May	Mispillion	Cannon Net
21-May	Cedar Creek	Walk-in trap
22-May	Ted Harvey	Mist Net
23-May	Brockenbridge Gut	Walk-in trap
24-May	Port Mahon	Cannon Net
24-May	Cedar Creek	Walk-in trap
25-May	Mispillion	Cannon Net
28-May	Mispillion	Cannon Net
29-May	Slaughter	Cannon Net
29-May	Slaughter	Walk-in trap
30-May	Port Mahon	Walk-in trap
31-May	Mispillion	Cannon Net
3-Jun	Mispillion	Cannon Net



What we do with the birds in hand...

All of the shorebirds caught were ringed with a metal USGS band identifying that individual as to where and when it was captured and processed. Data (including full biometrics) was recorded for all or a sub-sample of the shorebirds including:

- 1) wing length;
- 2) head and bill length;
- 3) age;
- 4) sex (if possible);
- 5) body moult index;
- 6) plumage score and;
- 7) weight



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2003 Shorebird Catch Totals

In 2003, the Delaware Shorebird Monitoring Team caught a total of 5119 shorebirds of 10 different species.

Highlight of the season!
Catching a Red Knot banded in the Arctic in 2002.

Species Name	Total Number	Recaptures
Red Knot (REKN)	1086	131
Ruddy Turnstone (RUTU)	1889	94
Sanderling (SAND)	608	32
Dunlin (DUNL)	305	9
Semi-palmated sandpiper (SESA)	1159	11
Least sandpiper (LESA)	12	0
Short-billed Dowitcher (SBDO)	55	3
Semi-palmated plover (SEPL)	3	0
Black Bellied Plover (BBPL)	1	0
Killdeer (KILL)	1	0
Grand Total	5119	280



Cannon Netting

- ✧ Collecting data on individual shorebirds. Each shorebird is banded with a numbered metal band as well as color bands for REKN and RUTU. The metal band identifies individual birds, allowing researchers to track its progress and life span if recaptured. The color bands allow for population and migration studies. In addition, each shorebird caught using these methods is weighed, measured, sexed, and assessed for breeding plumage.



Actions to Reduce Potential Impacts of Shorebird Research

Cannon Netting:

- ★ We succeeded in making a small number of larger catches, (*twice caught >800 birds!*) i.e. make sure we do not fire on small samples and disturb the birds for a small catch of birds.
- ★ We aimed to catch 100-200 of the target species on each catch.
- ★ We kept twinkling down to a minimum and did not fire unless there were at least our minimum sample size in each catch.



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Mist Netting



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Actions to Reduce Potential Impacts of Shorebird Research

Mist netting:

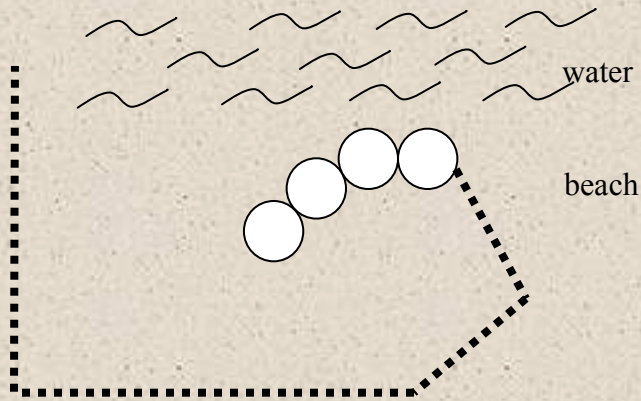
- ✧ Set nets in sites where we do not have to disturb birds while visiting the nets and process away from the feeding areas.
- ◆ Successfully used the tape lures to bring birds to the nets rather than put nets in the middle of the site.



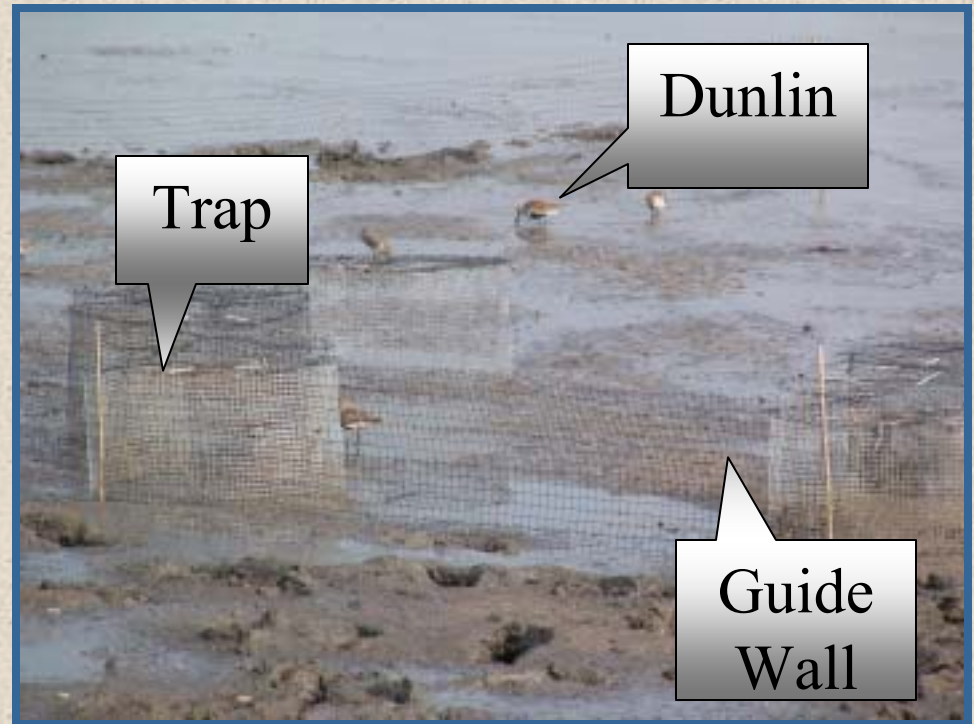
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Experimental use of walk-in traps



- ★ In 2003, we tried the use of walk-in traps to see if this will enable us to catch samples of the target species with the minimum disturbance to the feeding flocks.



Experimental use of walk-in traps

Date	Locality	R U T U	D U N L	S E S A	S B D O	Catch Total
20-May-03	Brockenbridge	4	3	0	0	7
21-May-03	Cedar Creek	3	0	0	0	3
23-May-03	Brockenbridge Gut	8	11	0	0	19
24-May-03	Cedar Creek	6	12	34	2	54
29-May-03	Slaughter	0	0	50	0	50
30-May-03	Port Mahon	0	1	41	0	42
						175



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Weight Loss after Capture Study

- ✧ Work in 2001 and 2002 has shown a difference in the rate of weight loss after capture in Knot but not Turnstone. As a result, in 2003, we needed to gather three samples of Knot weight loss data. An additional sample of Dunlin and Semi's helped produce cross species correction factors.



Shorebird Surveys & Scanning



Actions to Reduce Potential Impacts of Shorebird Research

Where possible, perform observations from a vehicle or boat or a blind, keeping sufficient distance to not disturb the birds.



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Scans for Color-marked birds











- ✧ All resightings of individually marked birds are valuable and recording them is a priority. In 2003 scanning of REKN and RUTU was done during shoreline counts. In addition, we recorded body profile values where possible to help gauge the rate of fattening of individuals.







Color Bands & Flags

★ There are 26 color combination flags used in the America's.

	CANADA		VENEZUELA
	UNITED STATES OF AMERICA		SURINAME
	MEXICO		COLOMBIA
	HONDURAS		ECUADOR
	COSTA RICA		GUYANA
	GUATEMALA		FRENCH GUIANA
	NICARAGUA		PERU
	BELIZE		BRAZIL
	EL SALVADOR		BOLIVIA
	PANAMA		PARAGUAY
	HAITI		URUGUAY
	PUERTO RICO		ARGENTINA
	DOMINICAN REPUBLIC		CHILE

Band Types and Codes			
			
Red code=R	Blue code=B	Green code=G	Yellow code=Y
			
Light Green code=L	Orange code=O	Pale Blue code=P	Black code=N
			
	White code=W	Metal code=M	

Flag Colours and Codes			
			
Canada code= Fw	Argentina code= Fo	United States code= Fg	Brazil code= Fb



Scans for Color-marked birds



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Bayfront Shorebird Surveys



Bayfront Shorebird Surveys

The Delaware Shorebird Monitoring Team conducted bayfront counts along the Delaware side of Delaware Bay from Woodland Beach area to the Cedar Creek area only twice during the month of May 2003 due to poor weather conditions.



Date	All Species of Shorebirds	Red Knot	Ruddy Turnstone
20-May	23927	587	893
27-May	28496	9525	8447



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Shorebird Movement and Disturbance Studies



Through Tidal Cycle Counts

- ✧ TTC's require most of the team on each count day. Three sites are covered for a period of six to twelve hours. The number of birds of each species, their behavior and the tide are observed and recorded at hourly intervals

This enables the bird activity patterns and amount of human disturbance to be understood as well as the feeding effort on different parts of the shore, related to tidal changes.

This helps us determine the area of suitable habitat that is needed to support shorebirds on spring migration.



Photos by Tim Lucas

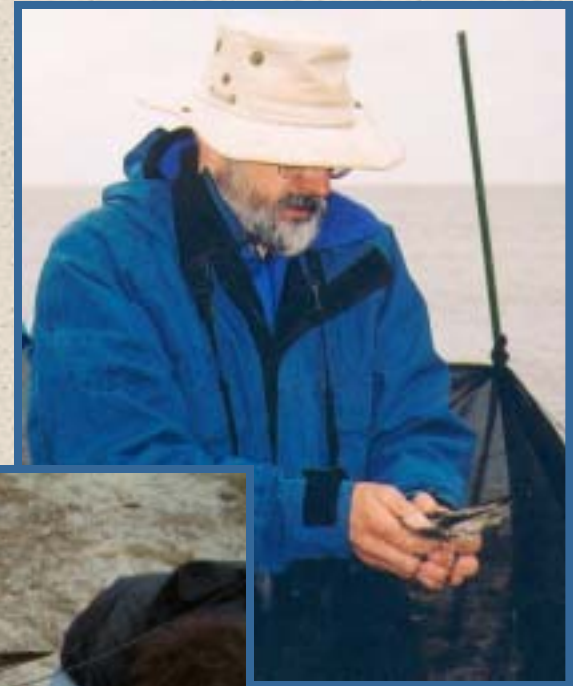


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Telemetry Studies

- ✧ In 2003 a total of 50 REKN were radio tagged on the DE Bay, 20 in DE and 30 in NJ. Their movements were monitored through manual tracking as well as fixed receiver stations.



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Behavioral Based Modeling Prediction of the Food Supply Needed by Shorebirds



Feeding Experiments and Egg Replenishment Studies



In 2003 egg enclosure experiments were conducted to compare the differing rates of egg removal due to tidal changes or shorebird predation. (Shorebirds were excluded from sample areas to measure the amount of eggs removed solely from tidal action.) Video surveillance equipment was also utilized to record feeding rates dependent upon egg density as well as competitor density.



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Additional Research Efforts



Influenza Viruses in Gulls, Terns, and Shorebirds

Two teams from the University of Georgia were in the Delaware Bay again this field season taking cloacal samples for avian influenza research.

The number of cloacal swabs in the following table corresponds to the number of birds sampled (1 cloacal swab per bird) in the Delaware Bay area. The results of the virus detection work are preliminary and reflect work conducted so far this summer. They should not be considered as final.



Species	New Jersey	Delaware	Total	% Positive *
Ruddy Turnstone	195	246	441	14%
Red Knot	52	62	114	2.5%
Semipalmated Sandpiper	0	8	8	0%
Dunlin	0	13	13	0%
Sanderling	87	0	87	0%

** Percentage of cloacal swabs in which Avian Influenza or other paramyxoviruses were detected.*



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Understanding the Migration of Different Populations of Shorebirds passing through Delaware Bay

A Pilot Study using Stable Isotopes



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Fall Migration

In the past, the Delaware Shorebird Monitoring Team has focused their efforts on the spring migration of shorebirds through Delaware Bay. The fall migration of shorebirds through Delaware Bay looks much different. The shorebirds do not concentrate into such a specifically defined window of time. This year, a small team are conducting counts on selected beaches during from July through October in an attempt to identify the timing the shorebirds on their fall migration through Delaware Bay.



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Shorebird Studies



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The Role of the Volunteers



What does it mean to be a Volunteer?



- ✧ Being an integral part of the research team!
- ✧ You catch birds on Mispillion Harbor on one day, scan for color marked birds the next, help with the data entry and help sort equipment and gear.



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Polar Kraft



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Shorebird Technical Committee Documents

Delaware Bay Shorebird-Horseshoe Crab Biological Assessment Report Delaware Bay Shorebird-Horseshoe Crab Biological Assessment Conclusions and Recommendations to the Horseshoe Crab Management Board of the Atlantic States Marine Fisheries Commission

Annual Reports (*2003 Annual Report to be published in August*)

Carter, D.B., N.A. Clark, and J.D. Hewes, eds. 2002. Delaware Bay – 2000/2001 The Delaware Shorebird Monitoring Team Bi-Annual Report. Delaware Coastal Programs, Dover, DE.

Carter, D.B. and K.B. Cole, eds. 2002. Delaware Shorebird Monitoring Team Annual Report 2002. Delaware Coastal Programs, Dover, DE.

Research Reports & Posters

Atkinson, P.W., I.G. Henderson, and N.A. Clark. 2001. A preliminary analysis of the survival rates of red knots *Calidris canutus rufa* passing through the State of Delaware 1997-2001. British Trust for Ornithology Research Report No. 274. [

Atkinson, P.W., G.F. Appleton, J.A. Clark, N.A. Clark, S. Gillings, I.G. Henderson, R.A. Robinson, and R.A. Stillman. 2003. Red Knots *Calidris canutus* in Delaware Bay 2002. Survival, foraging and marking strategy. British Trust for Ornithology Research Report No. 308.

Robinson, R.A., P.W. Atkinson, and N.A. Clark. 2003. Arrival and Weight Gain of Knot *Calidris canutus*, Turnstone *Arenaria interpres* and Sanderling *Calidris alba* Staging in Delaware Bay in Spring. British Trust for Ornithology Research Report No. 307.

Haramis, M., D. Carter, D. Weber, P. Osenton, H. Qi. 2002. Of Horseshoe Crabs and Red Knots...Stable Isotope Analysis Confirms Shorebird Dependence on Horseshoe Crab Eggs in Delaware Bay. USGS Poster

Articles

Carter, D.B. 2003. Delaware Bay Shorebirds - Searching for Conservation Solutions to Protect Nature's Amazing Spring Spectacle. Delaware Coastal Programs.



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http://shorebirds.skalizar.net



- Home
- About Us
- Reports, etc..
- Get Involved!
- Contact Us

NEWS

7 July 2003

A new section has been added to the website! Get Involved Section will give all of our volunteers up to date information and scheduled training dates, field work, etc...

27 June 2003

Now available for download from our Reports Section is the USFWS Shorebird Technical Committee Report and Recommendations!

27 April 2003

Check out the new Reports

Welcome!

Some of the most amazing animal migrations known are flown each spring and fall by shorebirds between the Arctic Tundra and South American wetlands. There are over 40 northern species of migratory shorebirds and each has its own special pattern of nesting in the north, migration, and wintering in the south. Most species however, depend upon key migration sites, typically coastal and inland wetlands, to rest and feed in preparation for their long journeys lasting up to 70 hours nonstop and covering over 2,000 miles at a time! Each stopover site is a critical link in the migratory flight of shorebirds.

Delaware Bay is an estuary of extraordinary biological value. Each spring, hundreds of thousands of shorebirds time their arrival in the bay to coincide with the spawning of thousands of horseshoe crabs. Since 1997, the Delaware Shorebird Monitoring Team, consisting of dedicated trained volunteers and research scientists, has been undertaking research into the population dynamics and health of key species of shorebirds on the Delaware Bay.

All of this work could
not have been done
without each of you!

*Mark your calendars
for 2004!!!*



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