

# The Decline of the Red Knot

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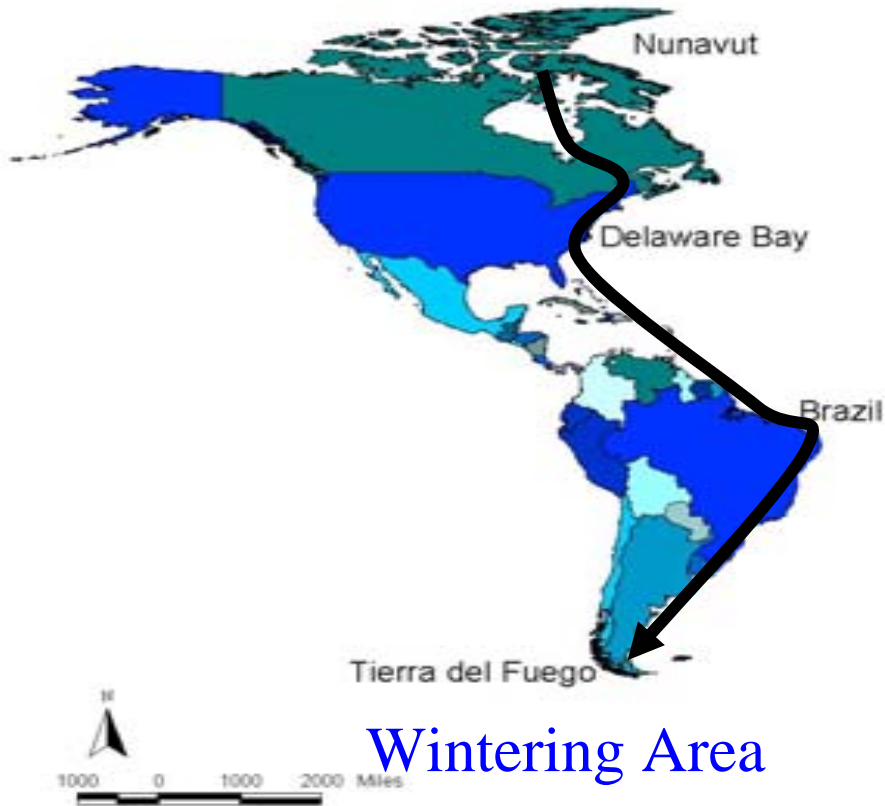


The red knot makes one of the longest migrations of any bird

Northbound Flight

Red knot, *Calidris canutus*  
Breeding, migration, and wintering grounds

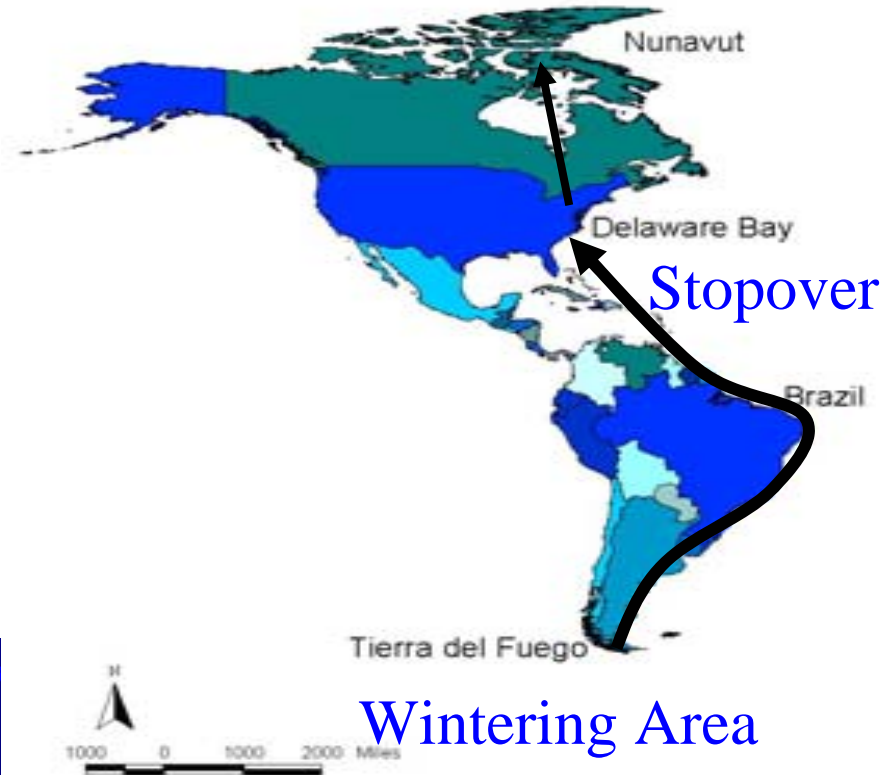
Breeding Area



Wintering Area

Red knot, *Calidris canutus*  
Breeding, migration, and wintering grounds

Breeding Area



Stopover

Wintering Area

South Bound Flight



The Delaware Bay  
is one of four major  
shorebird stopovers  
in the  
world



Shorebirds on the Delaware Bay gain up to 10% of bodyweight/day

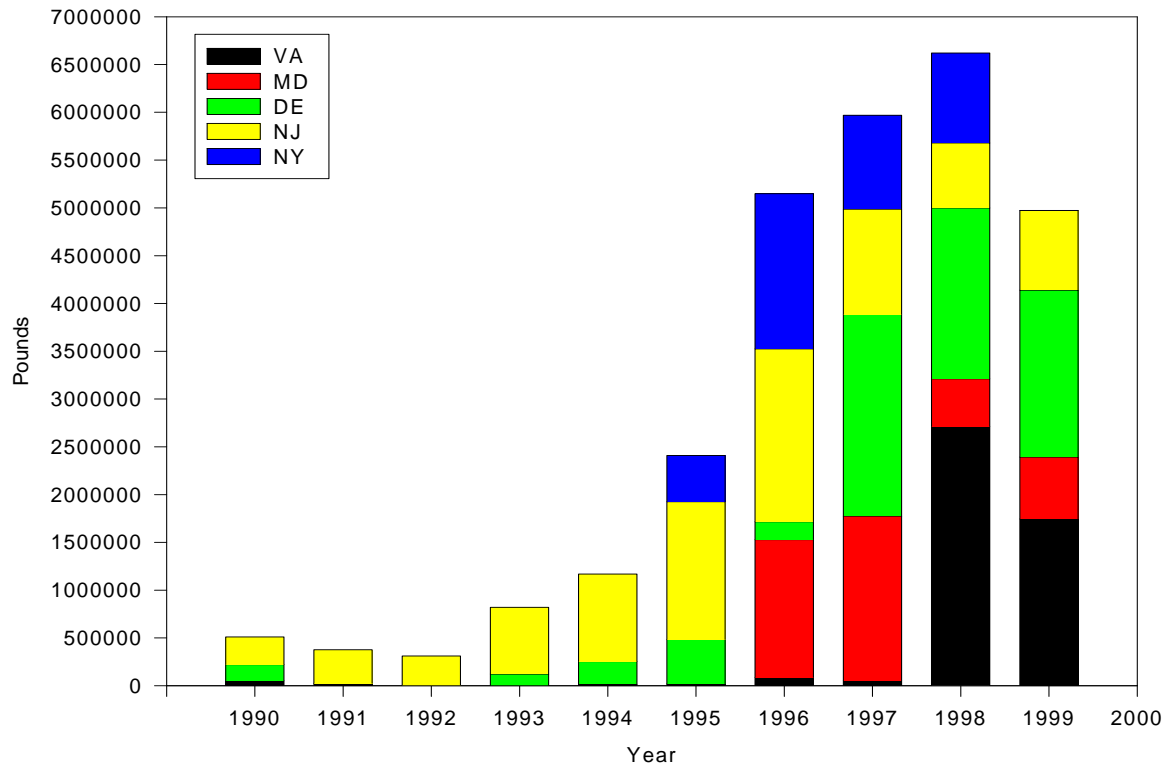


Until 1992, the harvest of horseshoe crabs was a tradition harvest to supply bait for a small eel fishery



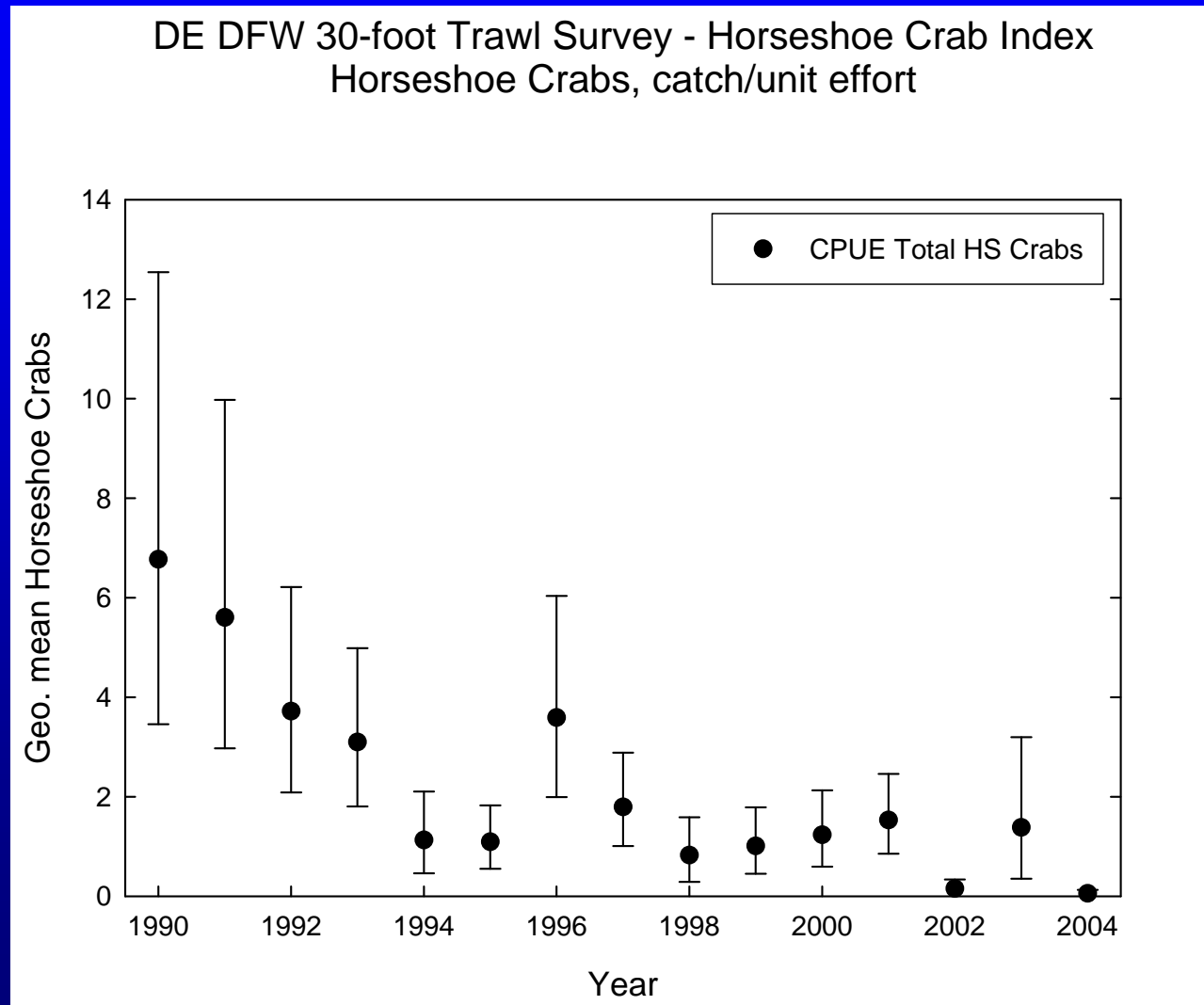
By 1996 millions of crabs were being killed to supply bait for a coast-wide conch fishery

### Recent Horseshoe Crab Landings (NMFS)



In 1998 the ASMFC created management plan for horseshoe crabs that froze harvest at 25% of peak harvest without any understanding of population size or recruitment

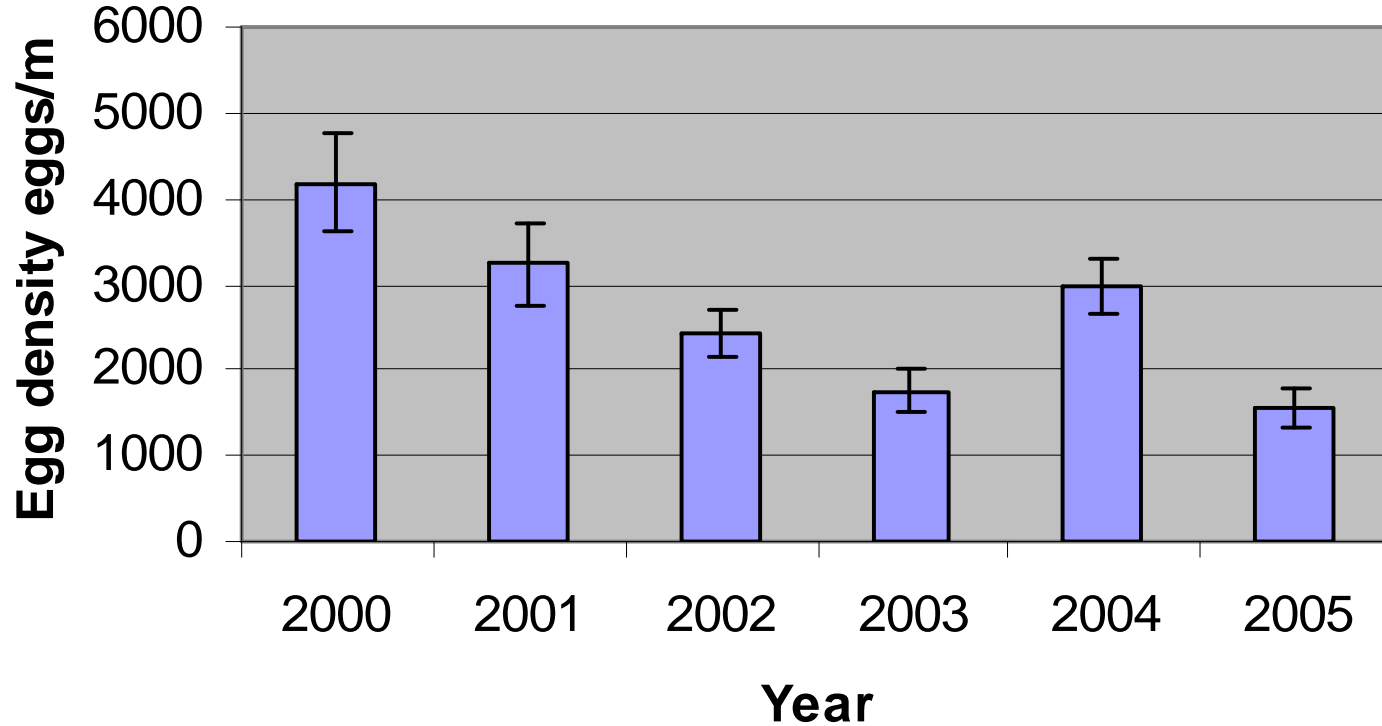
The only data available, a baywide trawl, was dismissed although it documented a 90% drop in stock





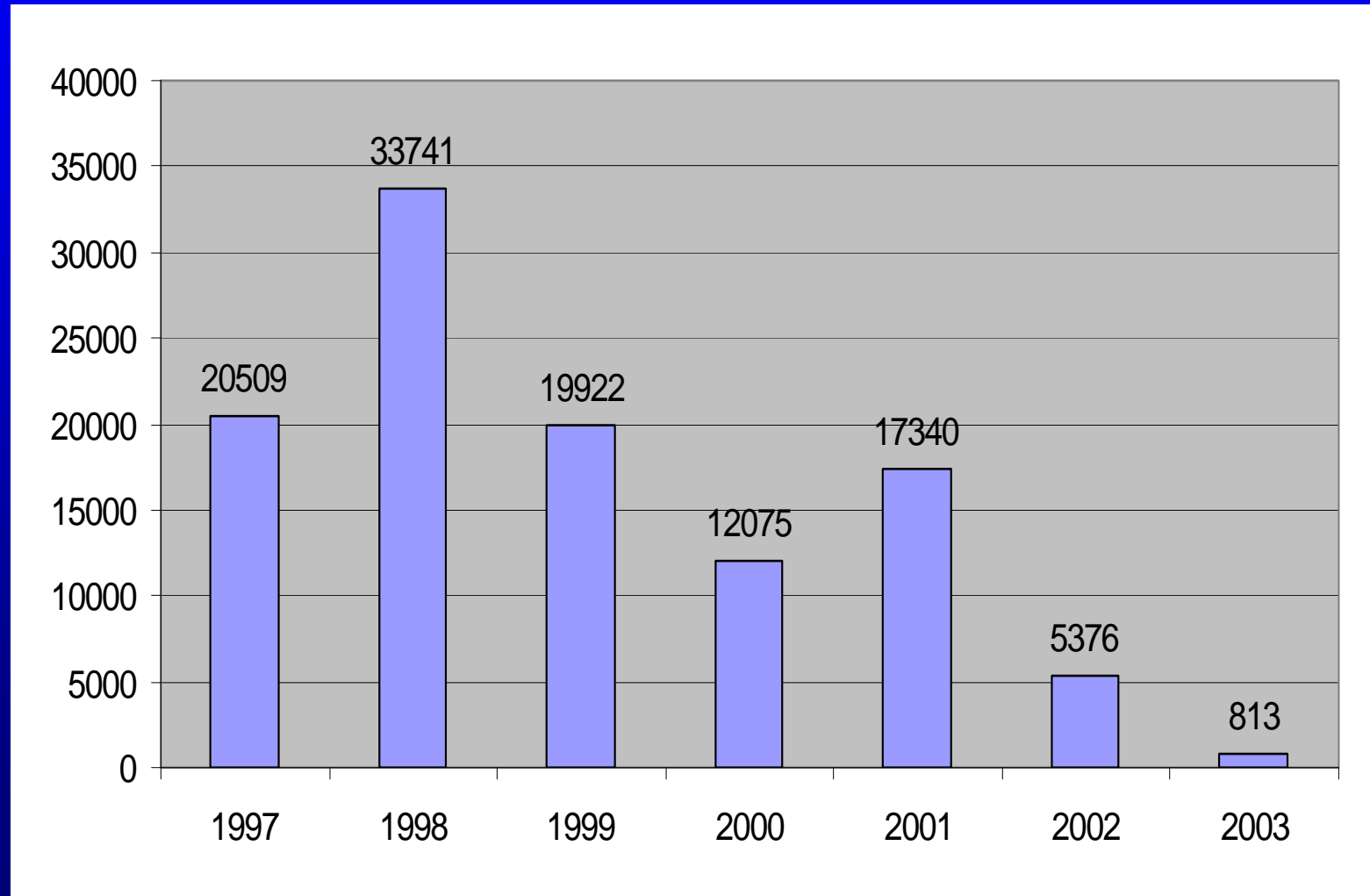
Egg densities on bay beaches fell from average counts of 40,000 egg/m in the early 1990's to 4000 eggs/m in 2000

**Mean Egg Density 2000-2005**



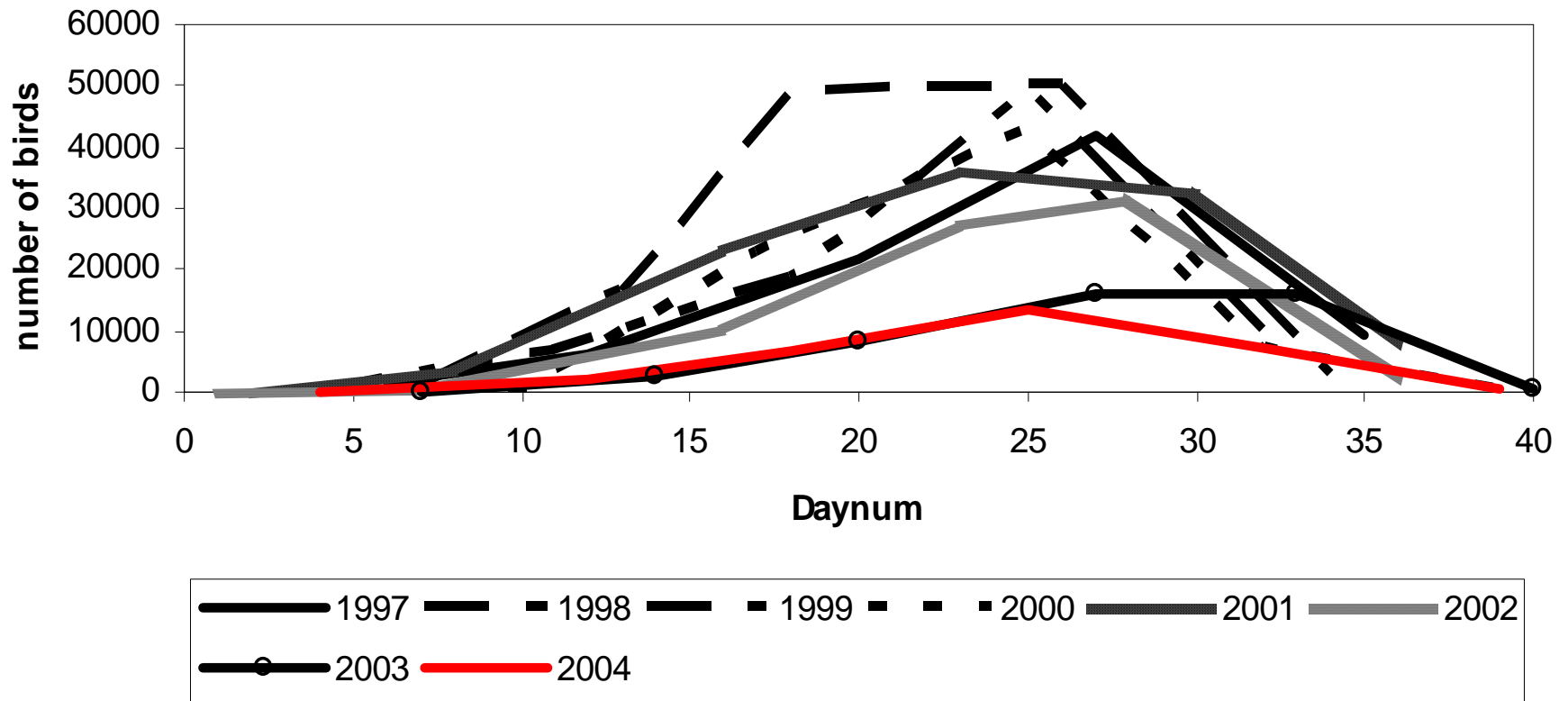


The number of red knots reaching weights  $\geq 185\text{g}$  fell dramatically between 1997-2003

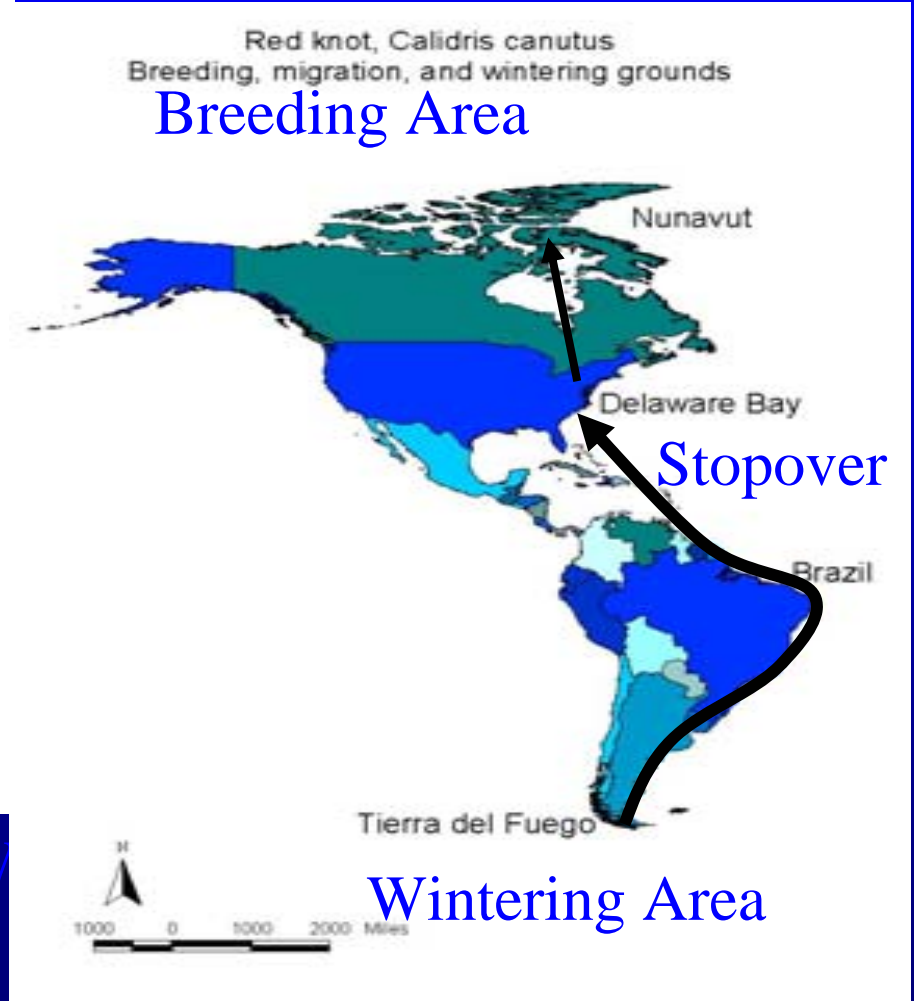
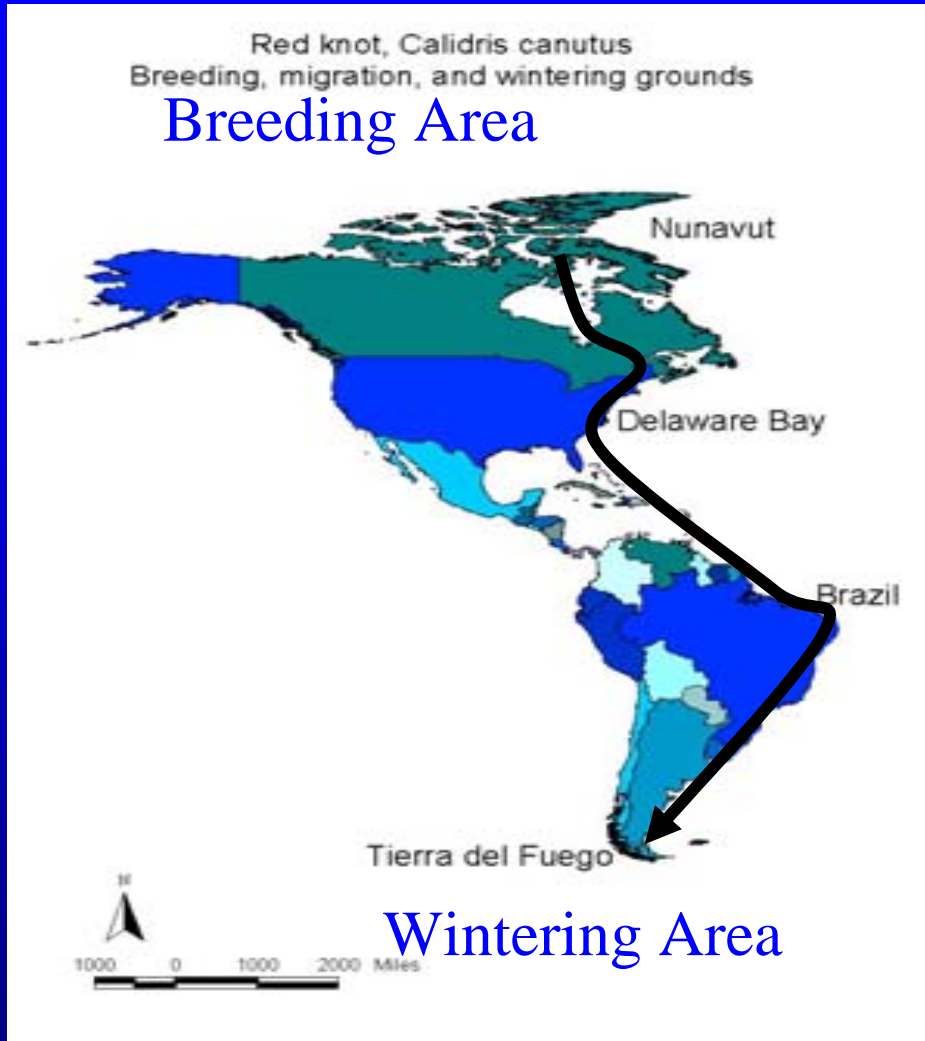


The Delaware Bay stopover population has been declining since 1997. Peak numbers of red knots of over 100,000 in the 1980's have fallen to 13,315 in 2004

Red Knot Surveys 1997-2004



We expanded our study  
to the primary South  
American wintering areas  
in 2000  
Northbound Flight



South Bound Flight



**We compared populations of the red knot and hudsonian godwit, an arctic breeder that does not stopover on the Delaware Bay**



Red knot numbers declined 68% in the period of our study

<b>Species</b>	<b>Region</b>	<b>1982/86</b>	<b>2000</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
		<b>Atlas</b>					
Red Knot	Tierra del Fuego	53232	51255	27242	29915	30778	17653
Godwit	Tierra del Fuego	31132	31090	46088	42470	66840	53725

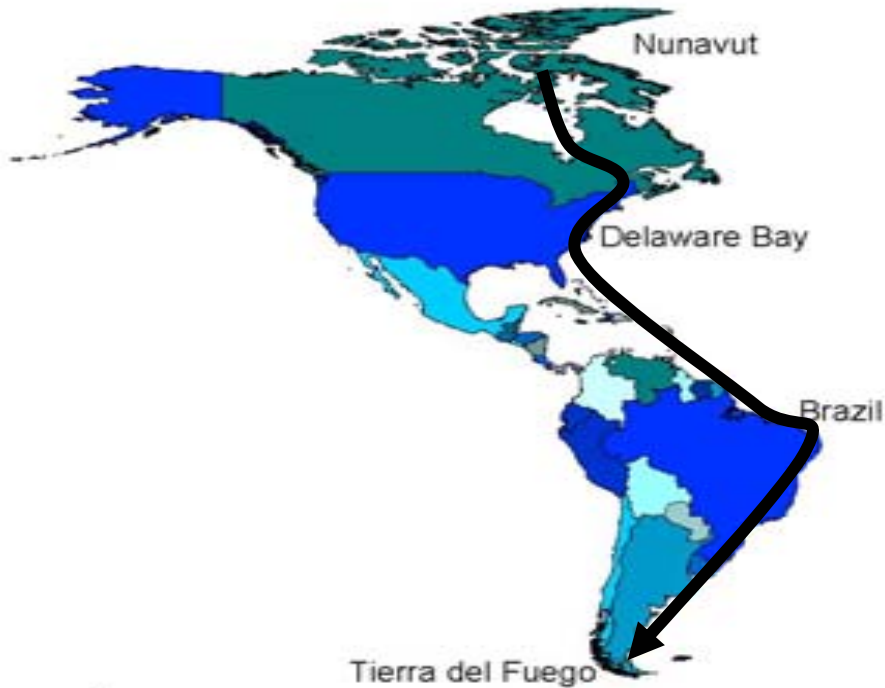
Numbers fell dramatically this year

We expanded our study to the primary breeding area in 1999

Northbound Flight

Red knot, *Calidris canutus*  
Breeding, migration, and wintering grounds

Breeding Area



Wintering Area

Red knot, *Calidris canutus*  
Breeding, migration, and wintering grounds

Breeding Area



Wintering Area

South Bound Flight

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The red knot was compared to the golden plover, a long distant migrant that does not stopover on the Delaware Bay



# Between 2000 and 2004 nest densities fell from 1.2 nest/km to .5 nest/km

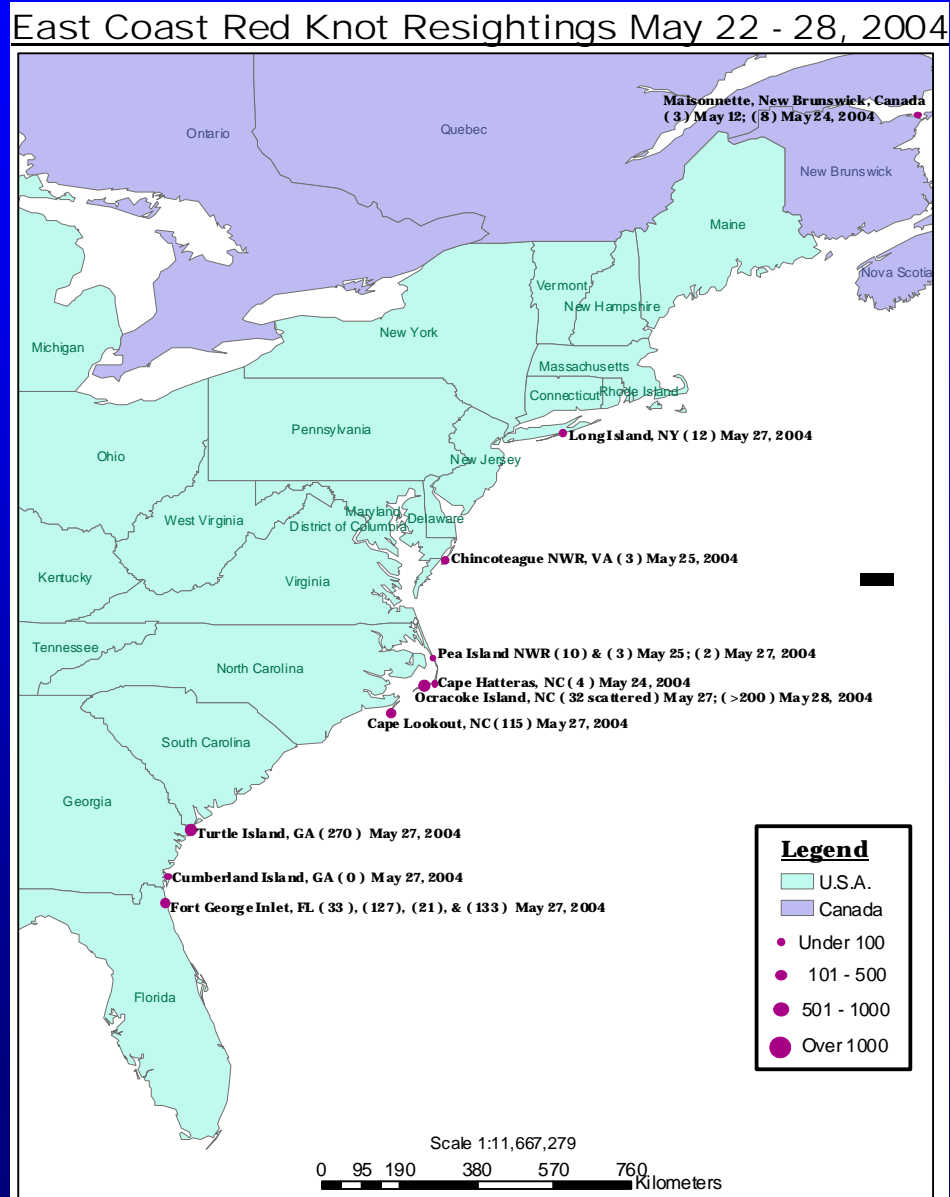
Table 2. Breeding density of red knot and American Golden Plover on Southampton Island study site, Nunavut, Canada, 2000 through 2004.

<b>Year</b>	<b>Species</b>	<b># Nests on Study Site</b>	<b>Breeding Density (Nests/sq. km)</b>
2000	Red Knot	11	1.155
2001*	Red Knot	7	0.765
2002	Red Knot	9	0.984
2003	Red Knot	3	0.328
2004	Red Knot	5	0.547
2001	Am. Golden Plover	7	0.765
2002	Am. Golden Plover	5	0.547
2003	Am. Golden Plover	10	1.093
2004	Am. Golden Plover	9	0.984

\* 2001 - early hatching year, seven knots with broods found on study site



# We expanded our study to the east coast in 2004

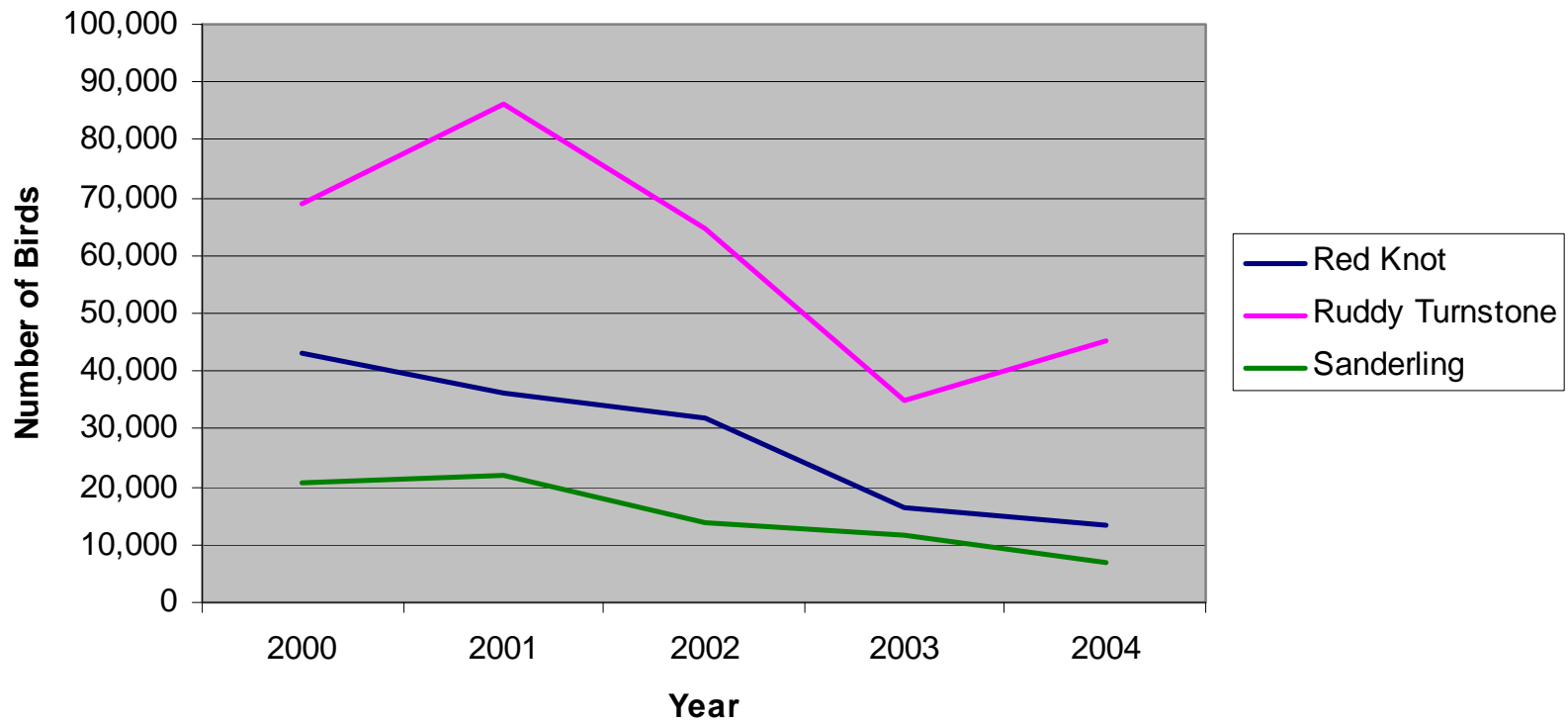


The differences in population counts in Tierra del Fuego and Delaware Bay indicates the knots that bypassed the bay in 2003 and 2004 died in 2005

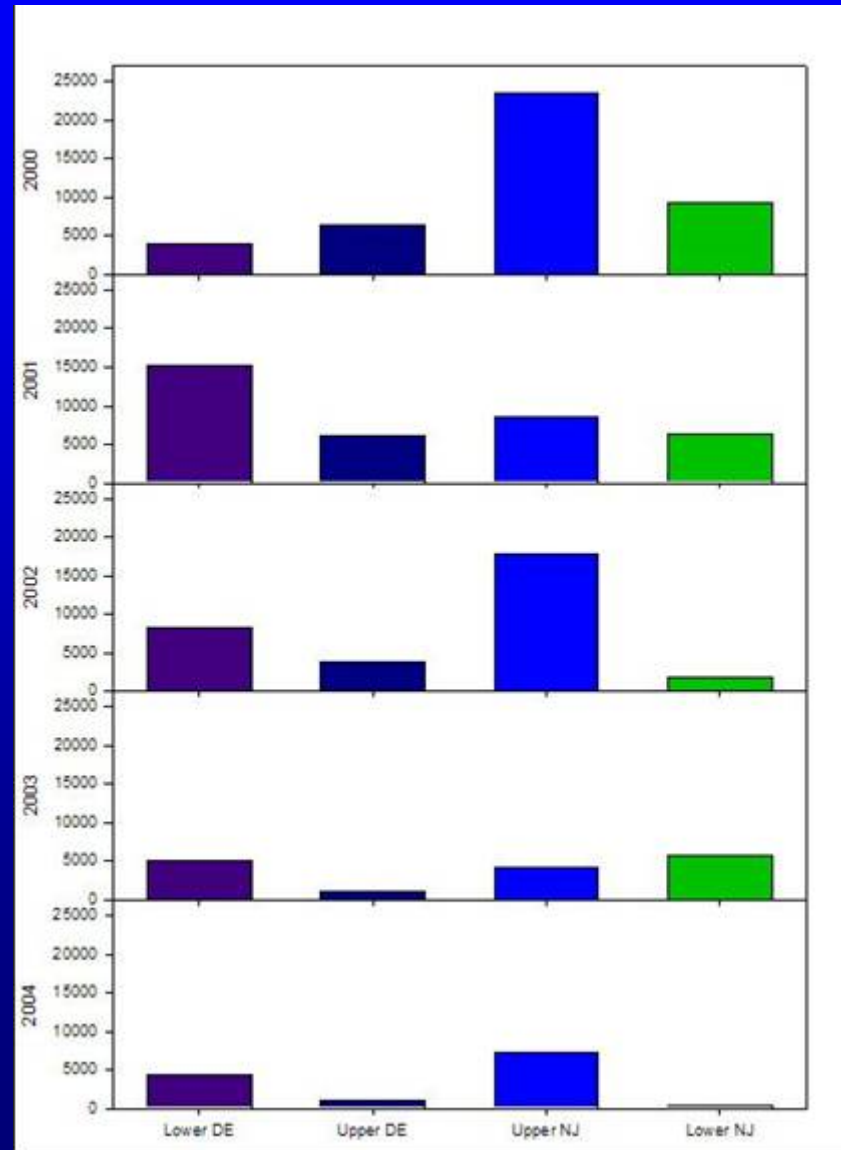
year	2000	2002	2003	2004	2005
Tierra del Fuego	51255	27242	29915	30778	17653
Delaware Bay	43145	31695	16025	13315	15300

The decline of the red knot represents a general decline and threat of all species that stopover on the bay

**Peak counts of Red Knot, Ruddy Turnstone & Sanderling,  
Delaware Bay 2000 - 2004**



Birds must now move about the bay in search of any significant source of eggs







# Why An emergency?



- Sudden decline in 2003 without corresponding declines in Tierra del Fuego suggest birds are now by passing the bay
- The subsequent failure to breed and poor mortality caused a 40% decline in Tierra del Fuego in 2005
- As yet unreleased data on the ocean trawl for crabs point to continuing declines in the horeshoe crab population despite 50% reductions in harvest.