

Sources: Carver, E. 2016. Birding in the United States: A demographic and economic analysis. United States Fish and Wildlife Service Report, 2016-2, 14 pp.  
McCann, J.M., S. E. Mabey, L. J. Niles, C. Bartlett, and P. Kerlinger. 1993. A regional study of coastal migratory stopover habitat for neotropical migrant songbirds: Land management implications. Transactions of the 58th North American Wildlife and Natural Resources Conference. Pp. 398-407.

[https://whsrn.org/whsrn\\_sites/delaware-bay/](https://whsrn.org/whsrn_sites/delaware-bay/)  
<https://www.fws.gov/refuge/prime-hook/visit-us/activities/hunting>  
<https://www.fws.gov/refuge/bombay-hook/visit-us/activities/hunting>  
[https://www.nj.gov/dep/fgw/pdf/2009/minutes/ensac\\_docs/dwp\\_dfw\\_report.pdf](https://www.nj.gov/dep/fgw/pdf/2009/minutes/ensac_docs/dwp_dfw_report.pdf)  
<https://www.dobirds.org/wp-content/uploads/2023/02/DE-State-Review-Bird-List-Feb-2023-1.pdf>  
<https://nationalzoo.si.edu/migratory-birds/neotropical-migratory-bird-faqs>  
<https://www.alamy.com/stock-photo/birds-icon.html?sortBy=relevant>  
<https://pinesland.audubon.org/landingbirds/critical-sanctuary-along-atlantic-flyway>  
<https://www.audubon.org/bird-guide>  
<https://ebird.org/barchart?byr=2023&eyr=2024&bmo=1&emo=12&r=US-DE>

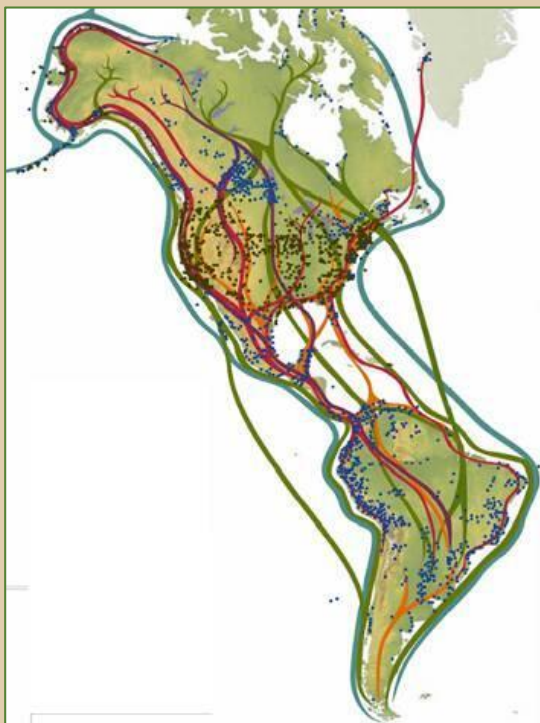
# BIRD MIGRATION

## IMPORTANCE OF DELAWARE AS A STOPOVER SITE

Compiled by Tahira Mohyuddin, Extension Graduate Associate and Dr. Gulnihal Ozbay, Cooperative Extension Director

### 300-25,000

RANGE OF MILES TRAVELED ANNUALLY BY MIGRATORY BIRDS IN DELAWARE



### 400+

NUMBER OF BIRD SPECIES DOCUMENTED IN DELAWARE



### 30+

Species of migratory shorebirds



### 70+

Species of migratory songbirds



### 5+

Species of migratory raptors



### 25+

Species of migratory waterfowl

### \$107.5 billion

ANNUAL REVENUE FROM BIRD-WATCHING IN THE U.S.

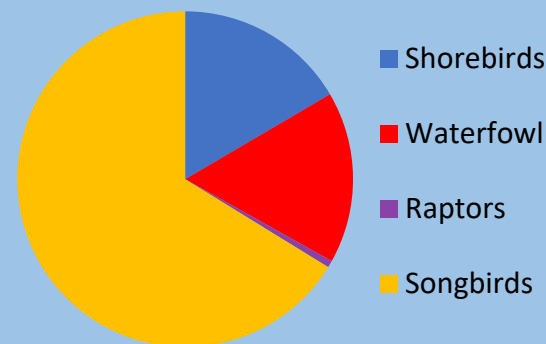
### 8,000,000+

BIRD-WATCHERS IN THE MID-ATLANTIC STATES ANNUALLY

### 2,000,000+

NUMBER OF MIGRANTS STOPPING OVER IN DE DURING MIGRATION

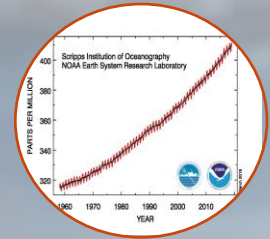
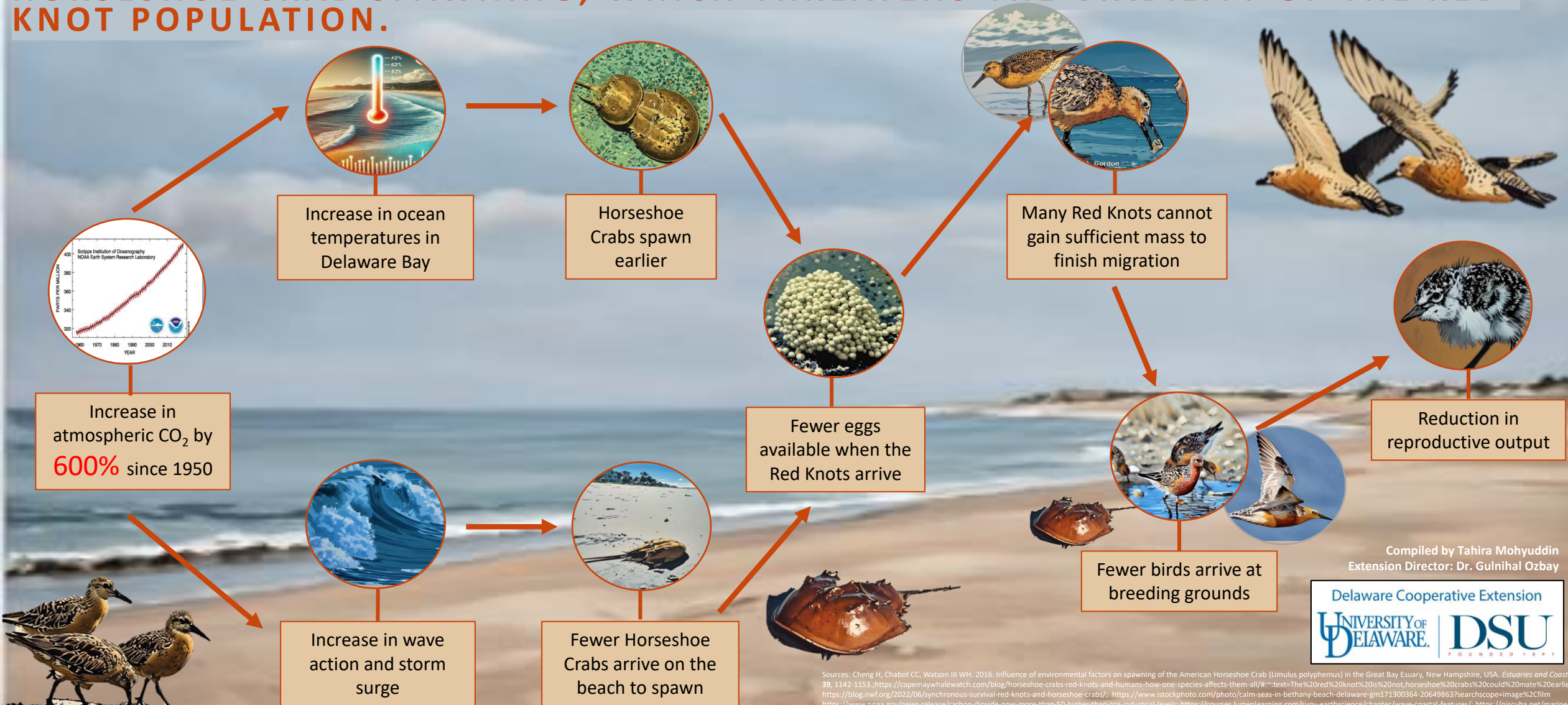
% of migratory individuals by group



NUMBER OF MIGRANTS THREATENED BY CLIMATE CHANGE IN DE

- Habitat loss from sea-level rise
- Changes in migration phenology due to warming temperatures
- Reduction in food supply

# EVERY SPRING, BETWEEN APRIL TO MAY, RED KNOTS STOP OVER ALONG THE DELAWARE BAY ON THEIR WAY TO THEIR BREEDING GROUNDS IN THE ARCTIC. HOWEVER, CLIMATE CHANGE IS AFFECTING THE TIMING OF HORSESHOE CRAB SPAWNING, WHICH THREATENS THE VIABILITY OF THE RED KNOT POPULATION.



Compiled by Tahira Mohyuddin  
Extension Director: Dr. Gulnihal Ozbay

Delaware Cooperative Extension  
UNIVERSITY OF DELAWARE | DSU  
FOUNDED 1791

Sources: Cheng H, Chabot CC, Watson III WH. 2016. Influence of environmental factors on spawning of the American Horseshoe Crab (*Limulus polyphemus*) in the Great Bay Estuary, New Hampshire, USA. *Estuaries and Coasts* 39: 1142-1153. <https://capemaywhalewatch.com/blog/horseshoe-crabs-red-knots-and-humans-how-one-species-affects-them-all/#:~:text=The%20red%20knot%20is%20not,horseshoe%20crabs%20could%20mate%20earlier,https://blog.nwf.org/2022/06/synchronous-survival-red-knots-and-horseshoe-crabs/>; <https://www.istockphoto.com/photo/calm-seas-in-bethany-beach-delaware-gm171300364-20649863?searchscope=image%2Cfilm>; <https://www.noaa.gov/news-release/carbon-dioxide-now-more-than-50-higher-than-pre-industrial-levels>; <https://courses.lumenlearning.com/suny-earthscience/chapter/wave-coastal-features/>; <https://njscuba.net/marine-biology/marine-shellfish/other-crustaceans/atlantic-horseshoe-crab/>; <https://www.shutterstock.com/image-photo/usa-florida-horseshoe-crab-on-white-793444897>; <https://www.shutterstock.com/image-photo/horseshoe-crab-shallow-water-791638546>; <https://roadsendnaturalist.com/tag/red-knot/>; <https://newsrelease.adfg.alaska.gov/index.cfm?adfg=redknot.printerfriendly>; <https://www.birdnote.org/podcasts/birdnote-daily/red-knots-and-horseshoe-crabs>; <https://www.nioz.nl/en/blog/red-knot-alaska-expedition-2022>; [https://www.inaturalist.org/guide\\_taxa/278257](https://www.inaturalist.org/guide_taxa/278257)