

Northern diamondback terrapin
(*Malaclemys terrapin terrapin*)



Christopher Rowe
Rowe@umces.edu

University of Maryland

CENTER FOR ENVIRONMENTAL SCIENCE
CHESAPEAKE BIOLOGICAL LABORATORY

The northern diamondback terrapin (“DBT”):

DBT is the only estuarine endemic turtle in North America. It lives in brackish marshes and nests in low-lying sandy areas.

Northern DBT range from North Carolina to New England.

Nests 1 – 3 x per summer, and lays about 6 – 20 eggs/nest.

Long-lived (> 40 yr.) and late to mature (females 6 – 12 years old).

Sexual dimorphism: females are much larger than males.

DBT feed mostly on invertebrates and prefer snails and bivalves

Predation rates are very high for DBT eggs and hatchlings.

Perhaps < 8 % survive 1st year (Byrd, 2002).

IUCN lists DBT as *Vulnerable* across its range, mostly due to a history of overharvesting (intentional and by-catch).

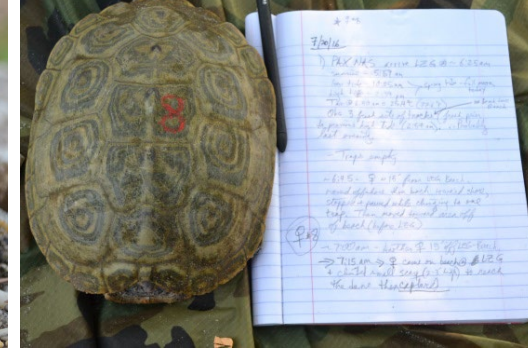


Image: John Harrison



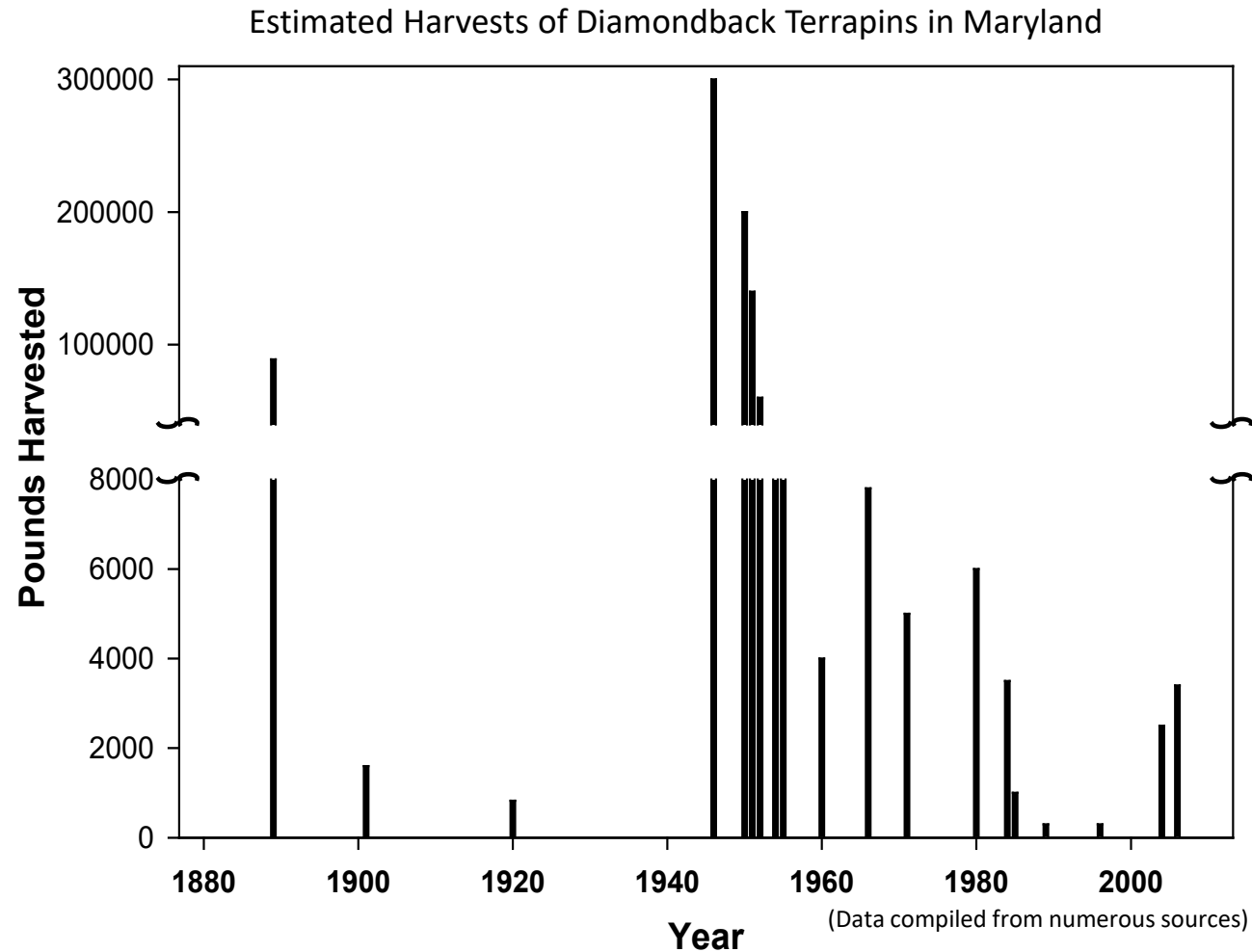
DBT is the Maryland state reptile and the mascot of UMD College Park.

Terrapins taste good.

Historical commercial harvest in Maryland:

Terrapin populations (as reflected by harvest records) have fluctuated enormously in Maryland's waters.

Periods of high abundance (high harvest) often followed by decades of low abundance, reflecting a "slow" life history.



As of 2007, commercial harvest of terrapins is no longer permitted.

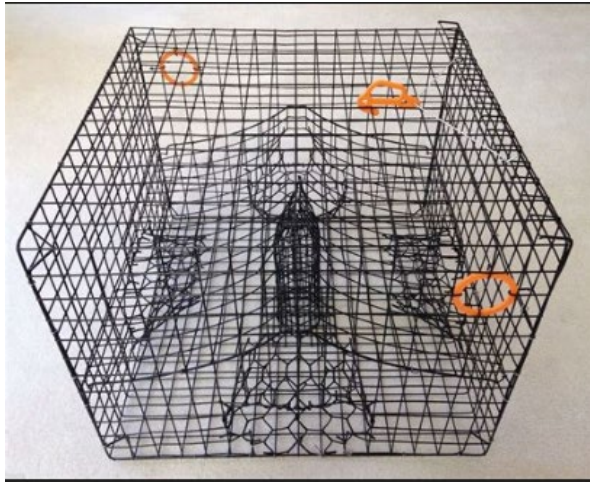
A ban on trapping the diamondback terrapin passes after advocates stick their necks out

Maryland's turtle finds safe waters

April 11, 2007 | By Tom Pelton | Tom Pelton, Sun reporter

The Baltimore Sun
11 April 2007

Ongoing issues: By-catch (unintentional harvest)



Crab pots.



“Ghost” pots.



Our friends at American Littoral Society pulled this abandoned crab trap from Jamaica Bay this summer. It contained 42 drowned terrapins and two live ones. Photo © Don Riepe

Year 2000: Maryland law requires **Bycatch Reduction Devices (BRDs)** on **recreational** crab pots.

Commercial crabbers are exempt.

**Use BRDs
It's the Law***

Crab pots used by waterfront property owners in Maryland must be:

- 1) Fitted with a Bycatch Reduction Device (BRD) in every entry funnel.
- 2) Marked with the owner's name and address.

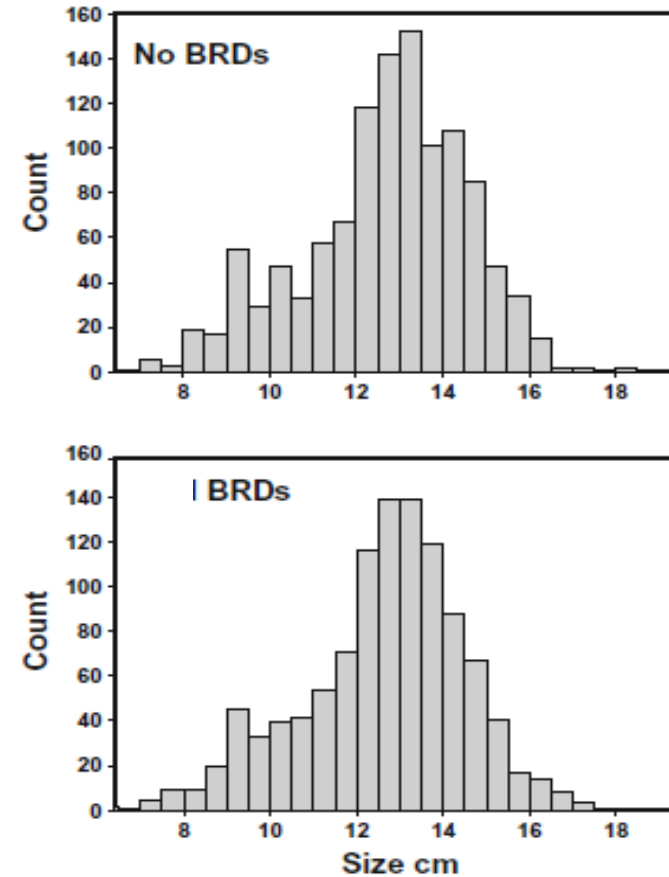
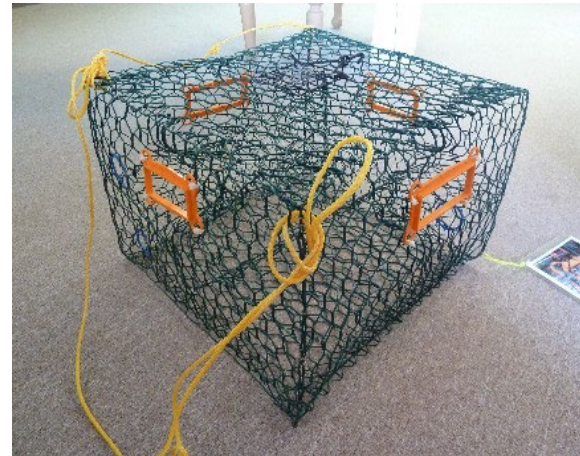
In Maryland, the BRD opening must be no larger than 1 1/4" x 4 1/4".

The diamondback terrapin is Maryland's state reptile, our state university mascot, and the only turtle that lives its entire life in the tidal waters of the Chesapeake Bay.

The BRD is easy to install and allows crabs to enter the pot but prevents diamondback terrapins from entering. Turtles and other animals that enter crab pots without a BRD cannot escape from the pot and will drown.

**Obey the law.
Catch the Crabs.
Save the Turtles.**

Learn more at: dnr.maryland.gov/fisheries/Pages/regulations/crabpot.aspx
*COMAR 08.02.03.07



No effect of BRDs on size or number of crabs captured.

Other studies have shown number of crabs captured may be more variable when BRDs are used.

Fig. 3 Size-frequency distribution of all crabs captured in the directed field experiment comparing pots with no BRDs ($N = 1140$) and pots with red plastic BRDs ($N = 1164$)

Corso et al., 2017. Estuaries and Coasts. DOI 10.1007/s12237-017-0223-4

Compliance rates are low (< 50 %).

Additional issues:

Vehicle strikes:

- Boats.
- Automobiles (nesting females).



Shoreline alteration:

- Bulkheads, rip rap.



Sea level rise:

- Loss of critical habitats.

Critical habitats

DBTs are dependent on brackish marsh and low-elevation coastal habitats that are susceptible to **sea level rise (“SLR”)**.

-- **Brackish marshes** and associated shallow subtidal habitats for feeding, sleeping, hiding, and mating.

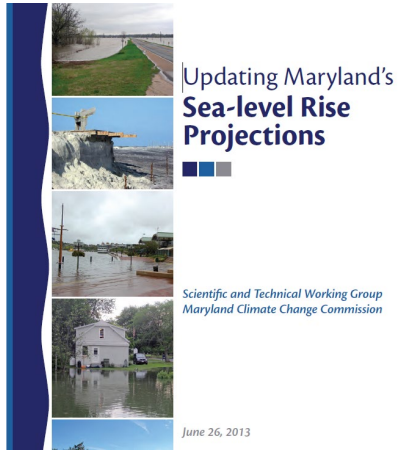
-- High beaches and nearby **undeveloped, sandy habitats** above high tide for nesting.



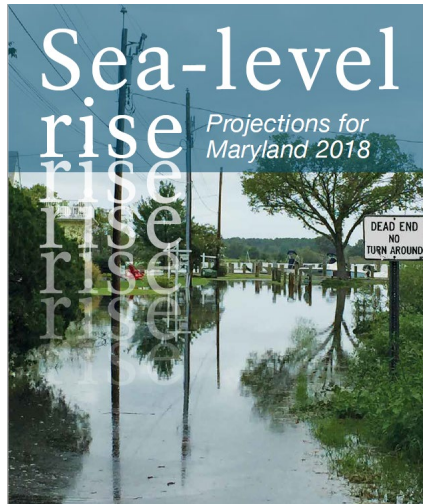
Feeding, sleeping, hiding, mating



Nesting, embryonic development



Boesch et al, 2013
<http://www.umces.edu/sea-level>

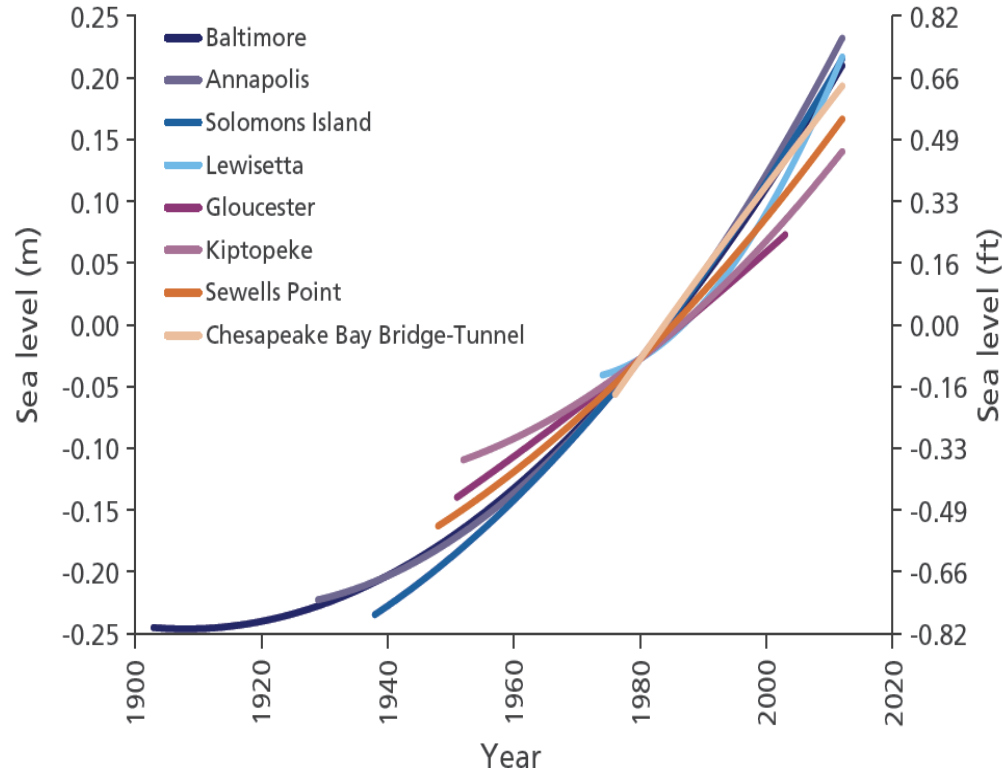


Boesch et al, 2018
<http://www.umces.edu/sea-level>

Sea level rise in Maryland

Historical sea level – past 120 years:

Trends in relative sea level at tide gauges around the Chesapeake Bay



Future projections for Baltimore, relative to year 2000:

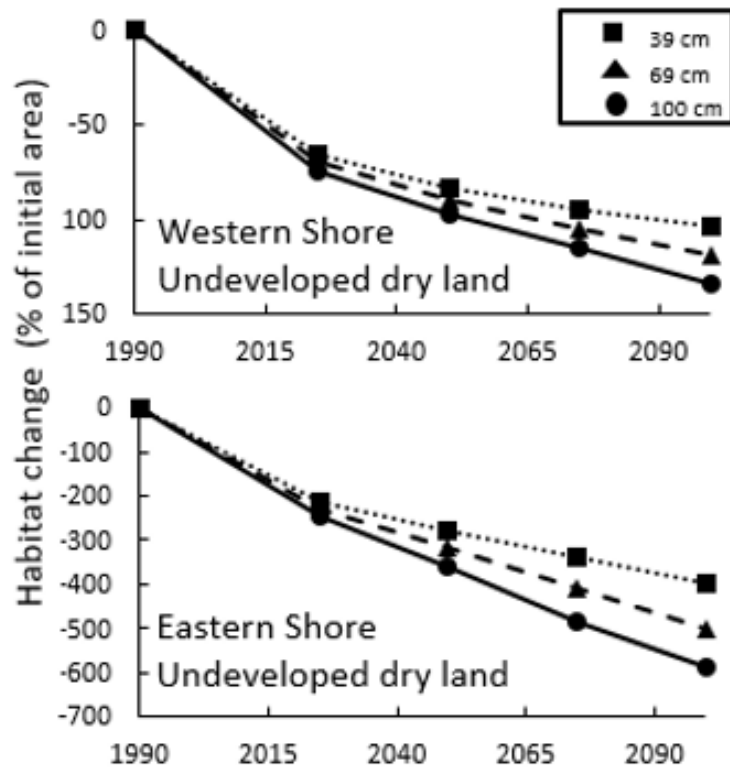
Year 2050,
9.6 – 19.2 inches (0.25 – 0.5 m)

Year 2100,
14.4 – 50.4 inches (0.4 – 1.3 m)

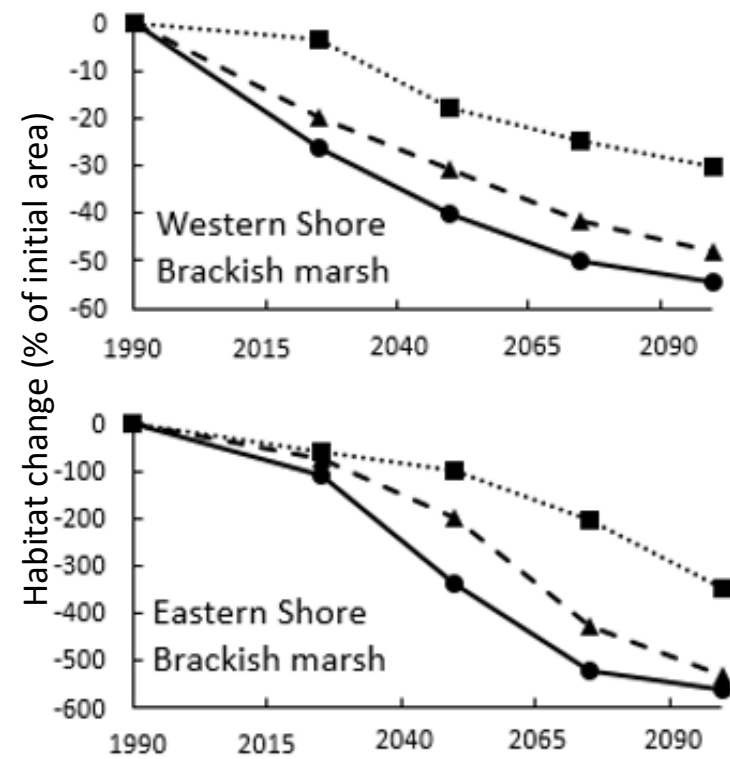
Projected habitat loss: % change from 1990 - 2100



Nesting habitat



Typical habitat

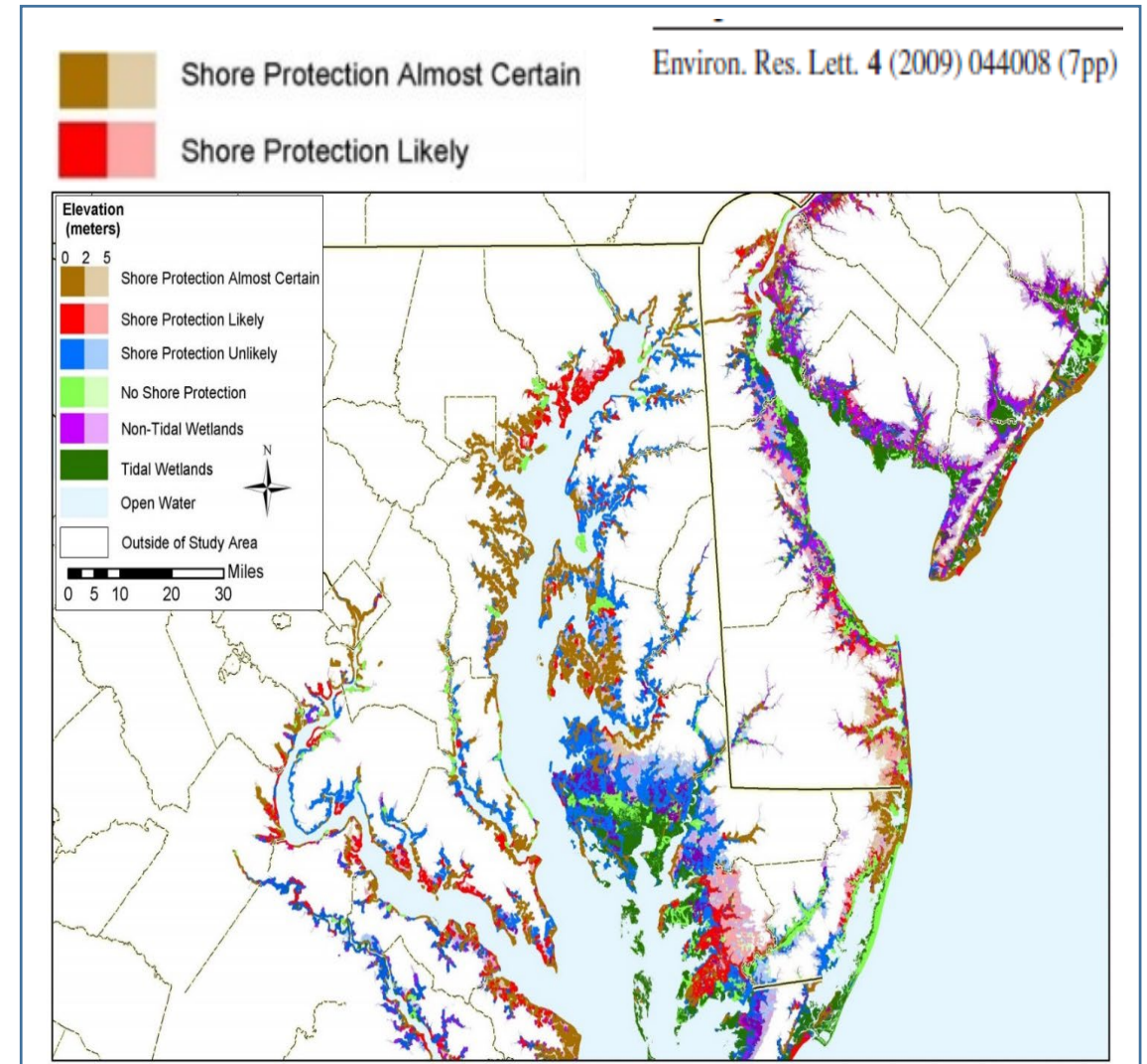


Homo sapiens' response to SLR exacerbates the situation.
Shoreline alteration prevents females from coming ashore to nest.

80% of Chesapeake Bay shoreline has already been altered from its natural state.



Projections for the future extent of protected shoreline in MD:



How to help Maryland's Diamondback Terrapins as they Face a Challenging Future.

Use BRDs on crab pots.

Required by law for recreational crabbers.

Explore alternatives to shoreline hardening.

Marshes or natural barriers to erosion are alternatives to bulkheads and riprap in some situations.

Be alert when boating in shallow waters in the Bay and tributaries.

Terrapins are nearly invisible until they raise their heads from the water.

Reduce pollution.

Greenhouse gases are responsible for sea level rise and habitat loss.

Use less electricity, gasoline/diesel, fuel oil.

Pollution reduction helps all wildlife, not just terrapins.



