

Virginia's Changing

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Rising seas, raging storms, and damaging flood waters that seem to never recede. Submerged houses. Eroded barrier islands. Such coastal horrors may be reminiscent of New Orleans, but the bayou is not the only coastal region that should be paying close attention to climate change and its associated threats.

Virginia is home to more than 5,000 miles of tidal shoreline, according to the Va. Institute of Marine Science, and much of it is terribly vulnerable to the impacts of climate change. In fact, according to a recent study by the U.S. Geological Survey, the Virginia coast is the second-most vulnerable coastal region in the United States—second only to the Gulf Coast region that includes New Orleans.

Climate change is also known as global warming for one very good reason: Our planet will get warmer. Perhaps significantly warmer. The southeast region of the United States has already warmed nearly 2°F since 1901—enough to alter spring bloom times and first frost dates—and could warm another 4.5–9°F by 2080. By the end of this century, Virginia's coastal areas could be facing summers where temperatures climb above 90°F on more than 75 days. Currently, the region experiences 15 to 30 such days every year.

Rocketing temperatures affect more than air conditioning bills, of course. Significantly warmer summer temperatures will lead to heat stress and heat-

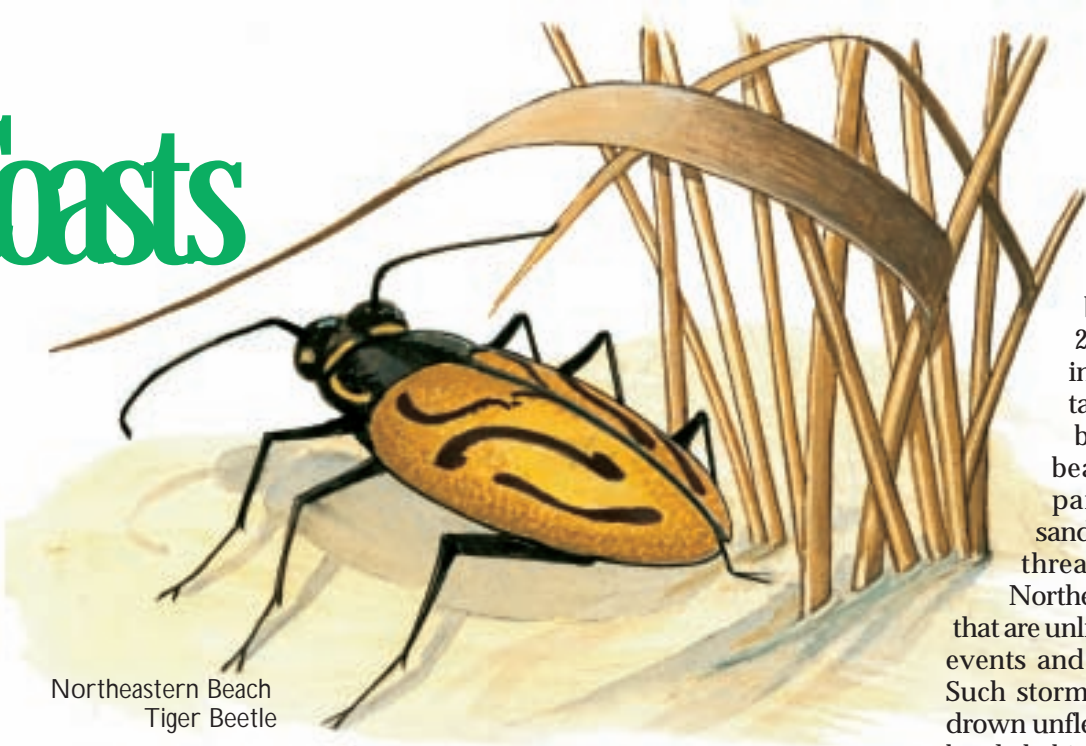


Northern Harrier

Be Wild! Live Wild! Grow Wild!



Coasts



Northeastern Beach
Tiger Beetle

related illness in plants and animals, could alter the growth patterns of plants, and will almost certainly cause many animals to shift their ranges northward. The Northern harrier (p. 20), for example, currently nests in Virginia's salt and brackish marshes. Also known as the marsh hawk, this large bird of prey cruises marshes and fields for small mammals, birds, and reptiles. Harriers build their nests on the ground, where they lay anywhere from 2 to 10 eggs. Although Northern harriers do nest along Virginia's coast, these birds more commonly nest in cooler regions—as far north as northern Alaska and Canada—and Virginia represents the southern limit to their breeding range. As temperatures climb, these impressive raptors may become no more than occasional winter visitors to the commonwealth.

Temperature is not the only thing that will change. More violent storms will pummel coastal and tidal regions. These storms, coupled with stronger waves, will lead to in-

creased damage and erosion from coastal flooding and storm surges. Low-lying salt marshes, mud flats and tidal areas will be hit hardest and could see severe losses due to erosion and storm damage.

More frequent and intense storms could spell disaster for coastal nest-

ing birds, such as the piping plover. Virginia's barrier islands support a small but stable population of about 200 breeding pairs of piping plover. The same habitats these birds prefer for breeding—wide open beaches that run into expanses of tidal mud and sand flats—are home to other threatened species, like the Northeastern beach tiger beetle, that are unlikely to weather the fierce events and floodwaters predicted. Such storms can wash away eggs, drown unfledged chicks, and deluge beetle habitat. Strong storms already impact piping plovers, and may have contributed to the poor survival rates seen in the 2008 breeding season, when less than one chick survived, on average, for every clutch of eggs laid. These fatal storm and flooding events will become more common in the coming decades.



Piping Plover

Perhaps most devastating, the seas will rise, submerging low-lying coastal land, salt marshes, and mud flats. Most predictions anticipate a rise of 2 to 6 feet. Because more than 350 square miles of Virginia's land lies less than five feet above sea level, such changes could swamp entire ecosystems. Already, one-third of the Blackwater National Wildlife Refuge is submerged and numerous Chesapeake Bay islands are losing ground or already underwater.

Absent coastal development, rising seas should simply push salt marshes and tidal habitats inland. However, because much of Virginia's coast is developed—one-fifth of Virginians live on or near the coast—many salt marshes will have nowhere to go. Some regions could effectively lose their entire marshy and tidal habitats.

Such a loss would be devastating for the many animals and plants that live in brackish salt marshes. The diamondback terrapin, for example, is the only turtle in the world known to live exclusively in brackish water. These attractive turtles sport diamond-shaped patterns on their shells and black spots and squiggles on

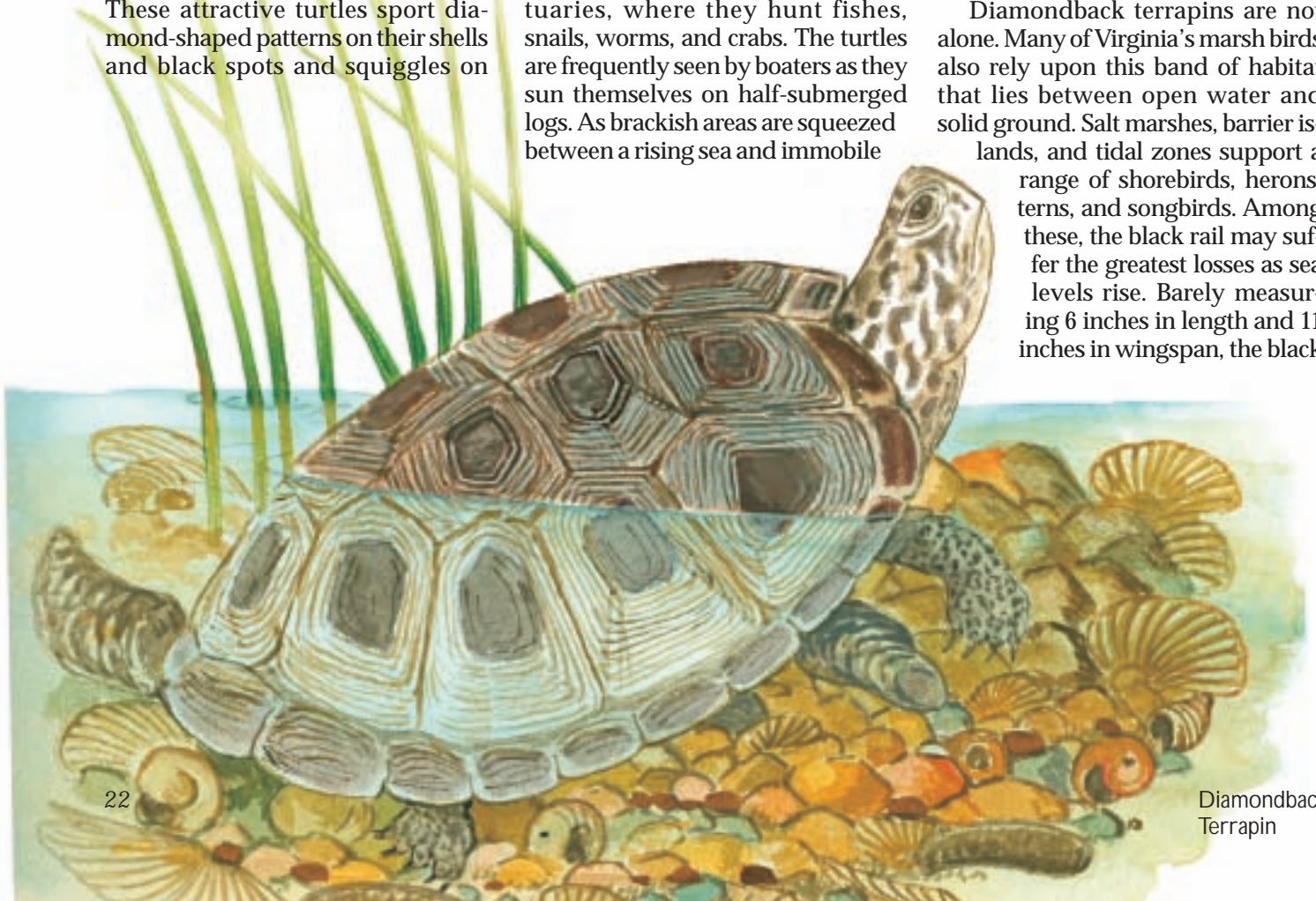


Black Rail

their faces and legs. Diamondback terrapins live throughout Virginia's extensive tidal marshes, bogs, and estuaries, where they hunt fishes, snails, worms, and crabs. The turtles are frequently seen by boaters as they sun themselves on half-submerged logs. As brackish areas are squeezed between a rising sea and immobile

coastal development, diamondback terrapins may become a rarer sight for boaters and water enthusiasts.

Diamondback terrapins are not alone. Many of Virginia's marsh birds also rely upon this band of habitat that lies between open water and solid ground. Salt marshes, barrier islands, and tidal zones support a range of shorebirds, herons, terns, and songbirds. Among these, the black rail may suffer the greatest losses as sea levels rise. Barely measuring 6 inches in length and 11 inches in wingspan, the black



Diamondback Terrapin

Act Wild

Want to help Virginia's coastal and tidal creatures weather climate change? Here are three simple ways to make a difference:

1. Support efforts to protect wildlife habitat locally and statewide. Undeveloped sweeps of land and water may be necessary as our climate changes, and some species begin to migrate further north or more inland.
2. Volunteer with local or statewide clean-up events or habitat preservation programs. Clean beaches and unpolluted waterways will help wildlife thrive today, ensuring they will be better prepared as climate changes become more dramatic.
3. Inspire your friends and family to get involved by sharing your knowledge and enthusiasm with them.

rail is the smallest and shyest of North America's rails. This secretive bird lives and breeds exclusively in irregularly flooded salt marshes, such as those that line Virginia's tidal reaches. Some sea level rise predictions indicate that their breeding areas will be completely covered with salt water. The black rail could become homeless.

Distance does not protect us. Climate change impacts across the country can still affect Virginia's wildlife. Already, fewer redhead ducks and other waterfowl are visiting the Chesapeake Bay as part of their annual migration. Drier conditions, caused by climate change, are damaging their breeding grounds in the Prairie Pothole region. Rising temperatures here also discourage the birds from visiting; warmer water impedes eelgrass growth, a habitat these birds rely upon for forage.

We cannot, at this point, stop climate change. Nor can we push the rising waters back into the sea. Salt marshes and tidal flats rely on free-flowing water and occasional tidal surges; seawalls would choke them

out. Instead, we can help our coastal ecosystems and wildlife survive the coming changes by bolstering their health and habitats today.

Many of the coastal animals and ecosystems that will suffer greatest from climate change are already at risk due to habitat loss, water pollution, disease, or invasive species. Because they are already struggling, these animals—piping plovers, diamondback terrapins, and Northern harriers, for example—will be less able to withstand the changes their habitats will experience as seas rise and temperatures increase.

In response, the Department has completed a plan of action that will help our ecosystems and wildlife weather the effects of climate change. Habitat preservation may be the best thing we can do. By limiting dense coastal developments, we preserve a zone of undeveloped land where salt marshes can migrate as sea levels rise. Reducing threats to individual species will also help, because when the species are able to thrive today, they are better able to adapt when their habitats or food supplies begin to change.

There is no denying that Virginia's coastal salt marshes, estuaries, and barrier islands will change in the coming decades. Rising seas will carve a new coastline, and warmer temperatures may invite a new suite of species to our shores. But, by protecting and strengthening coastal ecosystems today, we help ensure that some of our favorite animals and habitats remain here in the future as well. □

Cristina Santiestevan writes about wildlife and the environment from her home in Virginia's Blue Ridge Mountains.

RESOURCES

Virginia Wildlife Action Plan
<http://bewildvirginia.org>

National Wildlife Federation, Fact Sheet
www.nwf.org/globalwarming/pdfs/virginia.pdf

Center for Coastal Resources Mgmt.
Virginia Institute of Marine Science
www.ccrm.vims.edu

Wetlands Watch
www.wetlandswatch.org

