



## State of Change, Episode 4, The Terrapin's Troubles

**David Wheeler, Executive Director, Conserve Wildlife Foundation**

**(host):** Welcome to this episode of State of Change, the podcast where we explore how climate change is affecting wildlife in the Garden State. I'm David Wheeler, executive director of the Conserve Wildlife Foundation of New Jersey.

If you've spent time at the Jersey Shore, you may have seen the "turtle crossing" signs on roads that run along the water. More often than not these signs are in place to protect the diamondback terrapin. A species native to our coastal tidal marshes.

Terrapins have become the unofficial mascot of our coastal wetlands, from the Meadowlands to Barnegat Bay to Cape May. Their unique relationship with New Jerseyans – from a game species and local delicacy to potential recognition as a protected species – is nearly unparalleled in recent New Jersey. Yet with the dual threats of human encroachment and climate change, these turtles face an uncertain future.

**John:** Terrapin in NJ is a non-game species. It used to be a species that was harvested and then it came off the list a few years ago. It was signed into legislation that terrapins were protected and right now they're in consideration for becoming a species of special concern.

**David:** That's John Wnek, a supervisor and researcher at the Marine Academy of Technology and Environmental Science, or MATES, who also serves as a coordinator for Project Terrapin. After decades of leading terrapin conservation efforts, he is an expert on the species.

**John:** They were harvested in the 1800's into the 1900's because they used to make stews. They all involved some type of alcohol and when prohibition came around people realized how bad they really taste. So, the demand for them went down significantly but their biggest threat now is the pet trade.

There's a number of terrapins that are sold because people really like them. Out of turtle species there's very few that have unique markings. And terrapins have individual markings and colorations, so they're very sought after.

**David:** While diamondback terrapin harvesting in New Jersey is now illegal, previously you could harvest terrapins but only in the winter and by hand. This sought to restrict terrapin collection to small scale hunting purposes yet left a huge opening for poachers to collect massive amounts for the pet trade.

**John:** They're really cracking down because we want to get to the root of this. There has been a few cases where terrapins were taken out of NJ and sold to other states. Most of that was legally done because terrapins were still able to be harvested in NJ so there was no way to discriminate which were taken out of season.

What they did find was the way they were harvested in NJ was done through illegal measures and were sold out of state.

We had a case recently on Great Bay Boulevard. Ben Wurst works with that population. There was an individual from Pennsylvania who was caught with 1000's of Terrapins. Well over 3000.

**Ben:** Terrapins are a species that are in high demand by poachers because in Asia many of the native species have been so exploited that they can no longer be harvested. They're looking for other markets to harvest terrapins for the pet trade. That's where these poachers get more money.

**David:** Ben Wurst is the habitat program manager for the Conserve Wildlife Foundation of New Jersey. His work on diamondback terrapins, ospreys, and other species has helped wildlife recover along our coast. And one of the best wildlife spots on our coast is Great Bay Boulevard.

Known locally as seven bridges road, it was originally constructed to connect the mainland to the barrier islands. Yet the seventh bridge was never built, so it never actually connected with the barrier beaches. Today it's an incredibly scenic, 5 mile long dead end that is surrounded on all sides by stunning marshes and expansive vistas.

At times, perhaps it can be a bit too remote.

**Ben:** The Pennsylvania man who poached from Great Bay Boulevard was found to be applying for permits to export terrapins. That's when law enforcement really questioned how he came to have so many individuals.

I believe they obtained a warrant to track him and they found he was coming to Great Bay Boulevard at night and was observed digging up nests by law enforcement and bringing them to his residence in Pennsylvania. When they went to his property, they found around 3500 hatchlings.

Great Bay Boulevard is an area where we always thought they were being poached but had no proof. I call Great Bay Boulevard the wild west of the east because it is an area with minimal law enforcement. People do drugs and drag race at night. I can only hope that after the poaching case the local community will try to get their town to do more to protect.

**David:** During the day Great Bay Boulevard is also used for a multitude of more traditional outdoor pursuits such as crabbing and fishing. During the Summer months this leads to the road

becoming relatively high traffic. This is bad news for female terrapins trying to find a place on dry land to nest.

**Ben:** We're such a tourism based economy along the coast. When people are driving down the shore, they're driving down the shore when terrapins are nesting.

The first thing that got me to act was back in 2009 I found an individual who was hit by a car and was still alive. She was hit in the head and had a fractured mandible. I knew that even though terrapins are resilient animals and can overcome many injuries, I knew I couldn't just leave her on the side of the road.

I brought her to a rehabilitator, and she was released a few months later. That really sparked the fire in me to act because when you see an animal hit by a car, cold blooded animals are unique, they take a very long time to die. It's sad to see.

It's something where if I think I can prevent that from happening it's a victory. But it's one of the most challenging things because no matter what you do, there will be people who don't listen.

**David:** One of the first solutions Ben and his team used was fencing along roads that would prevent terrapins from crossing. This approach has also been used to great success in Cape May by the Wetlands Institute, as part of their efforts to champion terrapin conservation.

In Great Bay and Barnegat Bay, MATES and Conserve Wildlife sought to complement the fencing with another preventive measure.

**John:** What we want to do is make it so they don't need to cross roadways and put in nesting areas so that they can go to those areas without having to cross. We call those nest site enhancements. In Massachusetts they started making turtle gardens to make them nest away from roads.

We started making those in this area. There are many in LBI. Conserve Wildlife Foundation is embarking on one with Ben Wurst.

**David:** An evocatively named "turtle garden" is a very simple site enhancement that can make a world of difference for terrapins. It is basically a patch of sand added to an area that borders terrapin habitat, such as a coastal creek or bay. The idea is that if the turtles have an area to lay their eggs that is easily accessible from the water, they will have no need to cross the road.

**John:** We've had success at the LBI art center where terrapins would nest in the parking lot or hide under car tires and be run over. We'd get a call every summer about some kind of mortality in their parking lot. We've used that area as a pilot for turtle gardens.

Since that time, we haven't had a parking lot mortality. It seems terrapins are choosing that area now. We went from less than a handful to 14 or 15 nesting in one area.

**Ben:** What I've seen is terrapins are really able to hone in on these areas quickly and use them to reproduce. Seeing the hatchlings emerge from these gardens really brings things full circle. The old saying if you build it, they will come definitely holds true to this and I think installing these in more locations is crucial to helping terrapins adapt to climate change in New Jersey.

But that being said, we've seen individuals with broken legs, they're still coming to nest. Individuals missing legs and still nesting. Really that too is a sign that this species is more hearty than one would think. They live in an area with plenty of threats to them, hit by boats, eaten by other animals, it's amazing to see how they live on.

**David:** Even though terrapins are a tough species that can persevere through injury and constant danger, they face another hazard that lurks under the water from which no amount of self-determination could protect the turtle.

**John:** Another threat is crab pots, these overnight traps where terrapins can enter and not get out. Terrapins need to breathe air; they don't have very much time underwater. In the summer it could be less than hours before they succumb to drowning.

Juveniles and males get affected more. There's a number of these abandoned pots called derelict ghost pots that continue to fish for years.

**Ben:** Derelict or ghost crab traps are a growing threat as the crabbing industry takes off. Abandoned traps like that are self-perpetuating baited traps. Animals swim in, can't get out and die. Terrapins swim in and follow that same fate.

More so we see them as a victim of the boating industry. They drive over the crab pot and cut the line and the pot then wreaks havoc on terrapins.

**David:** Conserve Wildlife, MATES, Stockton University, and local fishermen, funded by NOAA grants, have removed over 1,300 derelict crab pots from Barnegat Bay over the last few years, with many more identified for future removal. And bycatch reduction devices, also known as BRD's, can be attached to a crab trap, allowing crabs to enter but barring the larger diamondback terrapins from getting in.

Although these are huge steps forward in conserving diamondback terrapin populations, much more needs to be done to protect them, especially as the threat of climate change looms over us.

**John:** One of the effects of climate change is increased sea level rise. We have been experiencing that. We're seeing levels higher than 25 years ago. What that means is areas that were not prone to flood events like spring tides flood areas they didn't before.

Couple that with storm tides, they push them higher now. Those areas are where terrapins like to nest. Now they can flood or be washed out.

**Ben:** In New Jersey a lot of our coast is not natural anymore. Its manmade. And that's no surprise it's the most densely populated state in the nation. We manufacture our beaches now because they're centered around a huge tourist economy. We're building up beaches so that they won't disappear.

Once we build up those beaches, that water is going to be pushed into these back bays. Since they're so low they're always the first to flood. Anyone who survived Sandy can tell you the worst flooding happened in the back bays.

The other aspect that doesn't help terrapins is that we've bulkheaded everything. That keeps the water out. You can't mess with mother nature and the force of water. It's going to find its way in. The bulkheads cause the water to go somewhere else and flood other areas and that's where our terrapins live, and nest sites are found.

**David:** Climate change brings the threats of sea level rise and increased flooding to terrapins, both daunting propositions. Yet the steady increase in temperatures poses another very unique threat to the turtles.

**John:** What happens during climate change is the rising temperature will raise the temperature of the nest. And with terrapins the temperature of the nest dictates their gender. Warmer temperatures produce more females, cooler temperatures produce more males.

A female can produce eggs, but they need to be fertilized. If that doesn't happen, we'll see declines in populations, and since there are fewer males more genetic relatedness and therefore more diseases.

Terrapins have a very shallow nest. They lay single digit eggs and are very shallow. So, it could be down to the surface temperature since the nests are so shallow. If there's just a degree or two it could skew female.

**Ben:** Females are produced higher in the nest and obviously at a warmer temperature than males, so certain populations might be bias to have more female.

No one really knows why turtles evolved to have the sex determination. They lack the X and Y chromosomes to determine their sex. If certain populations of turtles are bias to have more females who knows what might happen.

**David:** Climate change poses major risks to the future of terrapins in New Jersey. When you combine these threats with pressure from poaching, road mortality of nesting females, and suffocation in derelict crab pots, the challenges are great for terrapins in New Jersey. Now more than ever it is necessary for us to help these animals to secure a future in the Garden State.

**John:** We need to take a better role on more advanced conservation methods and learn more about the species. I think that's a key. We stepped one way now we have to go back.

It's going to be difficult to undo it, but I think we can help them survive and sustain. It's going to take effort. We can't just let them go on their own. It's important for us to step in.

**Ben:** Anyone who wants to help terrapins, the best thing is to pay attention when driving, in the summer months especially. It's all about paying attention when driving in coastal areas in the middle of the summer.

Another thing is if you are a crabber make sure you use BRD's. Make sure crabbers use BRD's because many do not.

Because we've built up everywhere, we've taken historic nesting habitat which would be the backside of barrier islands. If you drive along the coast, you'll see pretty much all of it is developed. So, a lot of nesting sites are gone and a way to give back is adding a small patch of sand on areas on the bay.

**John:** It didn't hit me for a long time. I work with this species and know its biology and characteristics. If you think, why do you really do this? Why is it so important? It's clear. They are a real indicator of the health of our marsh ecosystems and if you don't see them, we know our systems are impaired. Terrapins are ubiquitous with salt marshes. I consider them a keystone species because if you have a healthy marsh system you have terrapins.

As long as we still find them, we know that those systems still function.