

Maryland Diamondback Terrapin Task Force

Findings & Recommendations

Final Report to the Secretary
of the Maryland Department of Natural Resources
September 20, 2001

EXECUTIVE ORDER 01.01.2001.05

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SUMMARY

The consensus of the Maryland Diamondback Task Force is that the current population status and general health of the Maryland diamondback terrapin is unknown. Further, lacking a general stock assessment of Maryland terrapins their status will remain undetermined. However, the Task Force charged with recommending interim management strategies to the State of Maryland and relying on: (1) State terrapin records from 1878 to the present, (2) expert testimony, (3) regional, national and international trends, and (4) specific long-term research work conducted in the Patuxent River, concludes that the Maryland diamondback terrapin is an historically notable species in decline and in need of increased State protection.

BACKGROUND

Turtles in general have survived a number of catastrophes over the past 200 million years to include several ice ages, the breakup and collision of continents, and a huge prehistoric global event that eradicated most life forms to include the dinosaurs. Today, however, scientists from around the world have sounded the alarm that as a categorical family, turtles and by extension terrapins, may not survive their most dangerous threat to date - humans.

At a recent national conference, 60 convening experts concluded that half the 270 turtle species in the world today face extinction, most of which will probably disappear in our lifetime. International wildlife experts and representatives of 14 Asian nations at a recent United Nations conference on the "worldwide turtle crisis", confirmed these same findings. The Diamondback terrapin, the elusive icon of the Chesapeake and traditional Maryland symbol, is among those turtle species in decline and is listed as either declining, threatened, and / or endangered in many states along the Atlantic Seaboard.

As an important part of tidewater and American history diamondbacks: fed our impoverished minutemen during the hard times of the Revolutionary War, were a staple among 18th and 19th Century African-American slaves, and in the first half of the 20th Century a delicacy among the privileged members of society. The Maryland diamondback terrapin is one of Maryland's original commercial fisheries and is present at each significant phase of our country's history.

Nearly harvested to extinction in this past century, terrapins had been thought to be making a slow recovery. However, today their numbers once again may be declining through the cumulative impact of: (1) declining nesting habitat forever lost to waterfront development and misguided erosion control practices, (2) remaining fragmented nesting habitat that has become

increasingly vulnerable to increasing numbers of traditional predators, (3) by-catch drowning deaths of terrapins in crab pots situated in the shallow water areas of nearly every tributary of the Chesapeake Bay, and (4) a potential emergent commercial market with an ability to pay for all species of turtles. Taken together, the long-term viability of terrapin populations in Maryland waters is of great concern.

FINDINGS

Terrapin Life History & Ecology

Diamondback terrapins are the only truly estuarine turtle in North America. Diamondbacks are non-migratory and spend their entire lives in local creeks, salt marshes, and coves.

Terrapins differ dramatically in their life history traits from most fisheries species in the Chesapeake Bay. Most fishery species have high reproductive potential, i.e. they mature at an early age and produce a tremendous number of offspring when they reproduce. For example, oysters and crabs mature in 2-3 years and can produce millions of eggs when they reach maturity. Terrapins on the other hand produce only about 40 eggs per year and do not reach maturity until a minimum of 8 years of age. The low reproductive potential of terrapins indicates that females must reproduce for many years in order for the population to grow or remain stable.

Experts point out that turtles have a high biomass among vertebrates present in aquatic systems, and thus contribute to the feeding dynamic, nutrient and energy flow and the balance within ecosystems. As such, they play a critical role in their immediate environment and constitute a meaningful strand in the Chesapeake's tapestry of biodiversity.

Terrapins exhibit considerable variation throughout their range in body size, age at maturity, growth rate, egg size, clutch size and the number of clutches produced per year. For example, female terrapins in Florida mature in 4-5 years, nest up to 5 times per season, lay large eggs with 6-8 eggs per clutch. In Massachusetts terrapins mature in 12 - 15 years and lay up to 2 clutches per year of 15 -18 smaller eggs. In the Chesapeake Bay, female terrapins mature between 8 and 13 years, produce an average of 13 eggs per clutch and can nest up to 3 times per year. The best data on longevity in this species suggests that they can live beyond 50 years.

It is estimated that only two percent of terrapin eggs hatch, owing largely to predation by foxes, skunks, and raccoons, which dig into the nests and consume the eggs and baby terrapins. Survivors emerging from the nest are often eaten by gulls and crows or by herons and predatory fish after entering the water. Traditional intelligent predators increasingly target limited and fragmented nesting areas.

Throughout their range terrapins have been divided into seven sub-species based primarily on differences in life history traits. Recent studies investigating sub-species distinctions using molecular techniques in terrapins have suggested that only two sub-species exist.

Disappearing Habitat

Although the terrapin is considered an aquatic organism, it depends heavily on the near shore and

shoreline habitat to complete its life cycle. Female terrapins must lay their eggs in terrestrial open sandy areas to successfully reproduce. These are among the few times that terrapins must exit the water.

Juvenile and smaller male terrapins also rely on the near shore area where they forage on readily available prey such as clams, crabs, and small crustaceans. These individuals live on the edge of the marsh following the shoreline searching for food and at high tide entering into grassy, salt marsh areas.

Much of the natural shoreline in the Chesapeake Bay is excellent terrapin habitat because of the alternating areas of sandy beaches used for nesting and salt or fringe marsh necessary for juvenile feeding and growth. Areas where these two habitats are not found together usually do not support large populations of terrapins.

In the Chesapeake Bay terrapins nest on low lying beaches. Due to the low lying nature of these beaches most terrapin nesting occurs in areas that are marginally above the high tide line.

Competition for essential terrapin habitat is steadily increasing. Impacts include: loss of nesting habitat, poor recruitment due to increased nest and hatchling predation, beach disturbance, shoreline modifications that eliminate beach strand habitat essential for terrapin breeding, injuries and mortality due to boating and vehicle impacts during both active and inactive periods in their life cycles.

Many shoreline erosion control practices within Maryland today constitute a primary threat to diamondback terrapins. Current erosion control practices, principally stone revetment and bulkheads, destroy the narrow strip that has suitable sandy material required for nesting. Stone revetment and bulkheads, additionally block access to high beach elevations necessary for the successful development of terrapin eggs. As a consequence, terrapins attempt to nest in areas that are not sufficiently above high tide and the developing embryos drown, or females lay their eggs in higher grassy areas where eggs and hatchlings become entrapped or killed by grasses.

Traditional nesting areas have been severely and permanently altered by waterfront development.

Habitat loss is a significant threat to the continued existence of the Maryland diamondback terrapin in the Chesapeake Bay. Beach strand nesting areas are universally and permanently being altered through rip-rapping, bulkheading, and other shoreline stabilizing practices.

Beach habitat is critical to the continued existence of terrapins. Research in the Patuxent River indicates that more than 95% of breeding females return to a particular area to nest year after year.

Commercial Fishing Gear & Terrapin By-Catch Mortality

Perhaps the single largest factor affecting terrapin populations in the Chesapeake Bay today and through their range is their interaction with commercial fishing gear. Crab pots have been identified to be a large source of mortality for terrapins. Crab pots have been observed with as many as 49 drowned turtles in them.

Each spring and summer Maryland's Department of Natural Resources (DNR) receives reports

of turtles trapped and drowned in crab pots. These turtles are usually the diamondback terrapin which, under normal circumstances, may live for 50 years. Terrapins enter these crab pots and, like other air-breathing animals, drown when kept from taking a breath at the water's surface. A crab pot in the Patuxent River was once discovered with the remains of 49 drowned terrapins inside.

Crab pots set in previously unfished areas can have terrapin catch rates of 1 terrapin per 5 days. Although this does not seem like a high number, multiplied by thousands of pots that are fished both recreationally and commercially, this leads to a substantial impact on terrapin populations. It is estimated that terrapin populations can be decimated in 3-5 years in areas where there is heavy crab pot usage.

Terrapin mortality in crab and eel pots can be avoided by the inexpensive installation of By-catch reduction devices (BRDs). Terrapin deaths in fyke nets can be easily avoided by inserting a float in the cod end of the net that maintains a permanent air space. Neither technique reduces the catch of the intended species.

Maryland is one of the more forward states in that it has a regulation requiring the use of a by-catch reduction device (BRD) in recreational crab pots. Although the recreational crab pot fishery in Maryland has a large impact on terrapin populations, in the shallow water areas such as Tangier Sound and the coastal bays it is likely that the commercial crab pot fishery has a substantial impact on terrapin populations.

There is a lack of compliance and enforcement of the current recreational crab pot BRD requirement. Many boating and tackle stores clearly targeting recreational crabbers sell crab pots that do not have BRDs already installed, nor carry BRDs in stock.

By-catch mortalities in commercial fishing gear used by waterfront property owners are a leading cause of mortality (drowning) among terrapins.

Terrapins may encounter other types of fishing equipment that can kill them. Similar to crab pots, eel pots also pose a threat to terrapin populations. In a recent example, 21 terrapins were recovered from 4 eel pots fished in Washington Creek within a three-week period. This is similar to the catch rates of 1 terrapin per 5 pot days identified for crab pots. Fyke nets that are set with a submerged cod end during the warmer months, April - November, will kill turtles.

Commercial Harvest of Turtles & Terrapin

Millions of turtles are exported from the United States every year as food or pets. Turtle exports from the United States in recent years have soared. In 1995, the United States exported more than 84,000 map turtles, 23,000 snapping turtles and 38,000 soft-shell turtles. A five-fold increase from the previous year and a forty-fold increase since 1990. The vast majority of these increases are attributed to Asia's increased ability to purchase commodities from abroad. Given a lack of federal trade limits biologists have become increasingly concerned that turtle populations in the United States cannot sustain such harvests. As traditional turtle supplies dwindle it is anticipated that an Asian market will emerge for the consumption of the Maryland diamondback terrapin.

The number of watermen legally harvesting and reporting terrapin in Maryland is small. At last report one waterman reported a harvest worth approximately \$500. Unreported commercial harvests of wild terrapin, however, may exceed reproductive rates of the small remnant population of Maryland's first fishery.

Except for a detailed study in the Patuxent River, little is known about the terrapin in Maryland today. While the Maryland Diamondback terrapin has not been designated as threatened or endangered at this point, data does exist to refute the current viability of Maryland terrapins as a commercial fishery. Particularly, that a moderate trapping effort on or near a nesting beach can destroy 95% of a nesting population within one or two years.

Terrapin Management Practices

Of the 55 species of turtles in the United States, 21 are protected by law or under consideration for protection. Freshwater turtles have fared better than sea turtles. Scientists agree that many freshwater turtles, especially large river-based turtles, may not survive unless their habitats are better protected.

States along the Eastern Seaboard list terrapins in various protection categories from endangered to threatened to species of special concern. In Maryland, the terrapin is commercially harvested with the state's acknowledgment that the species is "declining in population".

The Nongame and Endangered Species Conservation Act protects most reptiles and amphibians in Maryland. A case in point is all native snakes. Any Maryland snake, unlike any Maryland terrapin, cannot lawfully be killed, possessed, bred or sold without a regulatory permit. New Maryland regulations have been recently adopted further restricting the possession, breeding, and sale of native reptiles and amphibians in Maryland. The specific citation with regard to snakes reads in part, "...snakes are part of our natural world and should be left there unharmed... worthy of our respect and admiration."

Maryland legislators passed the first terrapin protection act in 1878. Laws that govern the protection of terrapin today include:

1. No terrapin may be taken from May 1 to July 31.
2. Terrapin taken during the open season must measure at least 6 inches on the bottom of the shell (plastron length).
3. It is illegal to take, destroy, or tamper with terrapin eggs.
4. A license is required for the commercial harvest of terrapin. There is no limit to the number that may be harvested.
5. Regulations regarding possession and size do not apply to persons owning not more than three terrapins, which are being kept as pets.

Reptile populations have insufficient recruitment to allow for meaningful management of optimal or maximum sustainable yields. Maryland resource management of reptiles as a fishery, such as terrapin, has never accounted for "acceptable levels of biological removal", nor

accounted for reptilian life histories that do not allow for sustainable yields.

The Chesapeake Bay Agreement, Chesapeake 2000, provides the policy guidance and hope for the continuance of the Maryland diamondback terrapin as a viable Bay species. These policies are specifically articulated in the agreement's preamble, "We must manage for the future. We must have a vision for our desired destiny and put programs into place that will secure it." This vision is, specifically delineated in many of the agreements goals to include: " (1) Restore, enhance and protect the finfish, shellfish and other living resources, their habitats and ecological relationships to sustain all fisheries and provide for a balanced ecosystem. (2) Preserve, protect and restore those habitats and natural areas that are vital to the survival and diversity of the living resources of the Bay and its rivers. (3) Develop, promote and achieve sound land use practices which protect and restore watershed resources and water quality, maintain reduced pollutant loadings for the Bay and its tributaries, and restore and preserve aquatic living resources."

INTERIM RECOMMENDATIONS AND COMMENTS

- 1. Establish an immediate moratorium on the commercial harvest of Maryland diamondback terrapins in Maryland.** In the absence of a general definitive stock assessment of the Maryland diamondback terrapin, coupled with: expert opinion, low reproductive potential, current low economic value, few commercial participants, and a significant by-catch adult mortality rate, a conservative and cautious resource protection posture is warranted.
- 2. Fund a general stock assessment of the Diamondback Terrapin.**
- 3. If a terrapin harvest is to continue, it is deemed appropriate to enact a legal slot size limit (harvesting within this range) between 4 to 7 inches in plastron length.** Maryland should protect reproducing female terrapins. Slot limit standards serve to protect half of the reproductive females from harvest and all of the best reproducing females thus helping to maintain breeding stocks in the Chesapeake Bay and Coastal Bay areas. The Diamondback's susceptibility to over-harvesting is validated by its decline earlier this century. As with most reptiles, terrapin populations are very vulnerable to low levels of removal (less than 5%) of the local adult population.
- 4. If a terrapin harvest is to continue, establish a limited entry fishery to only those currently commercially reporting terrapin harvests.**
- 5. If a terrapin harvest is to continue, restore the original time period (1878 – 1974) of April 1 through November 1, when terrapin may not be taken and establish harvest limits of less than 1-2% of the bay-wide projected adult population.**
- 6. Ban recreational use of all commercial crab pots in tributaries of the Chesapeake Bay and Coastal Bays of Maryland.** The entrapment of diamondback terrapins in crab pots frequently results in the drowning deaths of trapped terrapins. Male and juvenile female terrapins are most vulnerable to shallow water and infrequently checked recreational crab pots. Banning the use of commercial fishing gear by recreational crabbers in all tributaries would: (1) eliminate frequent terrapin drowning incidents, (2) be consistent with the commercial ban of crab pots within tributaries, and (3) be viably enforceable as it would bar all applications of

commercial crab pots from tributaries.

7. Establish a research agenda that evaluates the impact of the commercial crab and eel pot fishery on terrapin populations, including developing and testing BRDs that will be cost effective.

8. In the absence of a commercial crab pot ban within tributaries of the Chesapeake Bay and Maryland Coastal Bays, mandate and enforce the usage of safe crab pots by requiring turtle excluder devices (By-Catch Reduction Devices, BRDs) on crab pot entrance funnels. Keeping terrapins out of crab pots would eliminate drowning deaths. Inexpensive wire excluders that can be snapped into crab pot entrance funnels have been field tested and deemed categorically successful. Conscientious use of BRDs would eliminate a significant portion of terrapin mortality. The enforcement of Maryland law should not be viewed as an option. Enforcement of the current BRD requirement is deemed most appropriate at recreational retail outlets and should be enforced at point of use.

9. Institute and apply regulatory enforcement practices that motivate meaningful obedience to Maryland law.

10. List the terrapin as, "In Need of Conservation", in accordance with Title 08.02, Chapter 12.01.C within the Department of Natural Resources (Fisheries) and as a "Species of Special State Concern".

11. Establish criteria for the regulatory identification of terrapin habitat through the use of descriptive attributes serving to promote beach conservation, protection, and restoration. The State of Maryland in developing these guidelines would better enable State permitting officials to protect the vanishing natural shorelines of the Chesapeake, its tributaries, and Coastal Bays of Maryland.

12. Identify and protect terrapin nesting beaches throughout the tidewater regions of Maryland. Terrapins require unrestricted access to nesting and over-wintering habitats. In Maryland, waterfront bulkheads and stone revetments prevent terrapins from reaching their traditional nesting beaches. The permanent loss of nesting habitat through the alteration of estuarine areas poses an imminent threat to many terrapin populations today. Smaller local populations resulting from fragmented habitat ultimately leads to the high potential for localized extinction.

13. Enact enabling legislation and administrative policy that specifies beach strand preservation mitigation requirements in all future shoreline erosion control projects. Model mitigation requirements using current Critical Area language, e.g. minimum necessary to provide relief, 3:1 habitat impact replacement, and mitigation requirements for tidal and nontidal wetland losses. Preservation of natural beaches with an emphasis on protecting a wide variety of nesting environments would ensure survivorship among terrapins.

14. Enact enabling legislation that encourages the preservation of terrapin beach strand habitat through the use of shoreline environmental easements and sensitive habitat acquisition funding. Use proposed shoreline mitigation impact fees as a future funding source, as well as the DNR's preliminary proposal for acquiring beach strand habitat using existing state revenues. Build on the contributions made by private property owners in recent years through

the DNR's Terrapin Nesting Sanctuary Program.

15. Enact shoreline management policies that take into consideration critical habitat for terrapin nesting. Shoreline stabilization should favor stabilization techniques that create terrapin nesting habitat in lieu of destroying it. State of Maryland funds should favor only shoreline stabilization techniques that are compatible with species restoration and the 2001 Chesapeake Bay Agreement.

16. Continue and expand the DNR's "Head Start - Repatriation" program to educate the public about terrapin conservation and to augment wild stocks.

17. Permanently establish Diamondback Terrapin Day as May 13th. Mid-May is when terrapins start to nest and are visible when surveying beaches. Additionally, this creature has a remarkable educational potential for the general public, particularly among non-traditional constituencies. Understanding and appreciation of this species by the public will offer significant advances to stewardship, habitat restoration, and resource protection.

18. Enact humane treatment regulations in the handling and shipment of terrapins.

Maryland Diamondback Terrapin Task Force

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EXECUTIVE ORDER
01.01.2001.05

Maryland Diamondback Terrapin Task Force

WHEREAS, The perpetuation of Maryland's beloved icon and official State reptile, the Maryland Diamondback Terrapin (*Malaclemys terrapin*) depends on concerted conservation efforts;

WHEREAS, Accurate biological data are needed to establish population estimates and institute management strategies which will help ensure continued progress in the protection and repatriation of the Maryland Diamondback Terrapin species in Maryland; and

WHEREAS, Coincident with the data collection effort, interim management strategies may be required to minimize further risk to Maryland's Diamondback Terrapin population.

NOW, THEREFORE, I, PARRIS N. GLENDENING, GOVERNOR OF THE STATE OF MARYLAND, BY VIRTUE OF THE AUTHORITY VESTED IN ME BY THE CONSTITUTION AND THE LAWS OF MARYLAND, HEREBY PROCLAIM THE FOLLOWING EXECUTIVE ORDER, EFFECTIVE IMMEDIATELY:

A. Established. A Maryland Diamondback Terrapin Task Force is hereby established to evaluate current population data and management practices for Maryland Diamondback Terrapins and recommend interim strategies to protect and preserve the species prior to the completion of a more comprehensive population study and management plan.

B. Membership and Procedures.

(1) The Task Force shall consist of up to nine members, including:

- (a) A member of the Maryland State Senate appointed by the President of the Senate;
- (b) A member of the Maryland House of Delegates appointed by the Speaker of the House of Delegates; and
- (c) Up to seven members appointed by the Governor, who have interest or expertise in animal welfare and/or Terrapin conservation, including a student and educator involved in the "Terrapin Station" initiative sponsored by the Department of Natural Resources.

(2) The Governor shall designate a Chairperson from among the members of the Task Force.

(3) A member may not receive compensation for serving on the Task Force, but may be reimbursed for expenses incurred in the conduct of duties under this Executive Order, in accordance with the Standard State Travel Regulations and as provided for in the State budget.

C. Scope. The Task Force shall have the following responsibilities:

- (1) Analyze and interpret data concerning current and future population trends of the Maryland Diamondback Terrapin.**
- (2) Assess current management practices and, based on the results of the population data analysis, make recommendations for more effective, long-term strategies for conservation and repatriation of the Maryland Diamondback Terrapin.**
- (3) Propose and assist the Department of Natural Resources in implementing interim measures to minimize further risk to the Maryland Diamondback Terrapin population while the comprehensive population study is in progress.**

D. Report. On or before October 1, 2001, the Task Force shall complete its work and submit a final report of its findings and recommendations to the Secretary of the Department of Natural Resources.

E. The Department of Natural Resources shall provide staff support to the Task Force.

