Natural Resource Management Plan
Supplemental Material
Turtles of Westchester County

Westchester County Parks, Recreation and Conservation Department
Ward Pound Ridge Reservation
Kendall O'Connell
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Introduction:

Objectives:

The objectives of this document are:

- To identify turtles of Westchester County and their range
- Act as a guide to land managers in Westchester County in regards to the conservation of turtles

About this Document:

This document is meant to be a supplemental guide to the Natural Resource Management Plans at each of the Westchester County owned sites in regards to turtles. Each land manager can use whichever relevant recommendations of this guide that apply to their park to inform their management plans if applicable.

Definition of Terms:

With turtles comes a unique set of terms to unify discussions of these species. Here are some common terms that will be used throughout the text:

- Ectotherm-"cold blooded"-these animals need the external environment to maintain their heat or to cool down-i.e. Reptiles and amphibians
- Endotherm-"warm blooded"-these animals are able to regulate their own body heat by internal means-i.e. Most mammals
- Hibernacula-area that a turtle will spend its bromate period
- Carapace-back shell
- Plastron- stomach shell
- Scute-oval shaped plate on the shell
- Herpetology-study of reptiles and amphibians
- Cloaca-orifice used for excretion of waste product and egg laying in females
- Gravid-pregnant
- Bromate-process when reptiles slow down during the cold weather. They are not asleep, but the metabolism lowers.

Identification of Turtles of Westchester:

Eastern Box Turtles

Eastern box turtles (*Terrapena carolina carolina*) are freshwater turtles ranging in length from 11- 15 cm (4.5-6 inches). As per the DEC (list updated in 2015) box turtles are a species of special concern and in Westchester County they are listed (updated in 2005) as threatened. Box turtles have a more arched carapace as they spend more time on land. The box turtle's plastron has a hinge allowing the turtle to hide all limbs and head completely inside its shell. The carapace and plastron have a unique pattern of brown and yellow on each scute. The males have red eyes and the females typically have a more caramel brown colored eye. Males have distinctly concave plastrons.

Diamondback Terrapins

Diamondback Terrapins (*Malaclemys terrapin*) are not a listed species. They live in brackish water in places like tidal creeks, salt marshes, or estuaries of rivers. They are grey, brown, or black on the carapace. The plastron can be green, yellow, or black. The skin is usually a lighter color with dark flecks on it. They have webbed feet ideal for swimming in strong tides and currents. They are mostly carnivorous preferring to eat shellfish and crustaceans. The females have noticeably larger heads and bodies than the males typically. Males will average around 3-5.5 inches (10-14 cm), females average around 5.9-9.2 inches (15-23.5 cm).

Eastern Painted Turtles

Eastern painted turtles (*Chrysemys picta picta*) are not a listed species. They are freshwater turtles with black colored carapace and skin with a yellow plastron. They have blotches of yellow, orange and red color patterns on their bodies giving them the appearance of being "painted". They are primarily aquatic turtles and are abundant in this region. They emerge from their hibernacula in May and remain active until October on average. They prefer slow moving bodies of freshwater like ponds or oxbows and are omnivorous.

Spotted Turtles

As per the New York DEC (list updated in 2015), spotted turtles (*Clemmys gutatta*) are a species of concern. In the county of Westchester, they are listed as threatened (list updated in 2005). They are small sized freshwater turtles with a mostly black shell and skin with randomly distributed yellow polka dots. They are an elusively shy species and are understudied in comparison to other freshwater turtles. They are omnivorous, although they tend to prefer a more sustained carnivorous diet throughout their lives.

Wood Turtles

Wood turtles (*Glyptemys insculpta*) are listed as endangered in Westchester

County (list updated in 2005) and listed as a species of special concern in the state of New York (list updated in 2015). They are small to medium sized freshwater turtles ranging 14-20 cm (5.5-8 in.)in carapace length. Wood turtles have a brown shell, and yellow or orange blotches on their limbs. The carapace has defined pyramidal ridges giving it a sculpted look. The plastron is yellow with possibility for black blotches on the scutes. Wood turtles have genetically dependent sex, which is unusual. They are omnivorous with the young tending to eat a more carnivorous diet and the old tending to consume more vegetation. Males have distinctly concave plastrons. In the warmer months wood turtles are more terrestrial and in the cooler months, they are more aquatic.

Research Methods:

Permitting

Before working with turtles check with the Department of Environmental Conservation (DEC) to determine which permitting is required to work with each type of turtle. Westchester is zone 3, please reach out to that representative.

Marking Turtles

For marking turtles for individual identification, notching turtles carapace is the standard among herpetologists currently. The process involves filing a notch into the marginal scutes of the turtle with a triangular file. Each turtle has their own unique combination of notches to identify them upon later recapture.

Visual Surveys

Surveying is an integral part of turtle detection. One kilometer transects can be predetermined on Google maps for the survey based on historical data recorded for that park. Transects should be walked for three days in a row before declaring presence or absence.

The method of surveying implemented utilizes three researchers for aquatic species. An observer is placed in the middle of the river and two other observers walk at the same pace down the transect over the course of an hour. Those on the banks search far from the river, as wood turtles are known to travel far especially during nesting season in the spring. A distance of 10-50 meters is suggested as an ideal distance to maximize efficiency. If alone, a researcher walks that one km transect in the stream and zigzag pattern along the banks up to 25 meters out in an attempt to find the turtles. A similar method can be adapted for more terrestrial species in meadows and forests.

Nesting occurs in late May and early June for most turtles. Random searches right before thunderstorms could be of value in this time frame if recruitment is an objective.

Trapping

Hoop nets (~8" diameter ~24" long) can be deployed. The hoop nets should be tethered to the shore or nearby vegetation to prevent being swept away in the current. Each is outfitted with PVC piping floatation devices to ensure air pockets for breathing are maintained for turtles caught in a trap. Each net should be marked with the permit holders contact information and permit number. Over the course of the season nets should be in the water for periods of 24-97 hours at a time. The nets should be checked every 24 hours when deployed to ensure the best management at each site is being maintained.

Important Information to Gather

The standard in researching turtles is to measure

- Straight carapace length
- Carapace width
- Plastron length
- Total shell height
- Weight
- Sex
- Gravidity

- GPS coordinates (or some other indication of location)
- Notching code

Water Quality Testing

Leaf packs can be implemented in waterways to help indicate water quality through macroinvertebrate presence. In the leaf packs, leaves, pine needles, twigs and other debris from that part of the park closest to the waterway should be put inside the onion bags to allow the macroinvertebates to enter into the pack from whichever column they occupy in the water. The macroinvertebrates in the bag can help to indicate the health quality in the waterway, as some species are more sensitive than others to deviations from a natural range in the waterway.

Using a water quality testing kit, from an organization like LaMotte, nitrate, nitrite, pH, phosphate and dissolved oxygen levels can be tested in the waterways. Each of these materials have a healthy rage for water, but if too far out of that range could indicate negative influences like agricultural runoff, presence of sewage in the water, industrial pollution, or several other detriments.

Engaging the Public

Certain select members of the public can help with locating various species in the park like high school interns, Science Research students, and members of Friends groups. Public sightings can be reported either in person, by email, or by phone. A site-specific turtle reporting email can be made for this purpose that can be accessed from any computer and by anyone at that site or involved in a herpetology specific project. This allows for positive educational conservation opportunities in our parks.

Management Recommendations:

General

Predation

Predation on most turtle nests is high. If a nest is found, a protector should be placed over the nest for the duration of incubation. A nest protector can be as simple as a foot-squared piece of hardwire mesh stretched over a wooden frame and placed securely over the nest. It can also be much more complex depending on the type of predator. Trail cameras are a great way to determine what type of protection is needed, as many predators on nests are mammals that will trigger a camera.

Treatment with Pesticides

There seems to be a link between pesticides and health related issues in box turtles like ear abscesses and bacterial infections. The implications of these relationships are not entirely known. In assuming a worst-case scenario relationship, management plans should limit the amount of pesticide used in box turtle land use corridors. If pesticides must be used, follow the directions associated with that chemical and use as far away from water as possible.

Habitat Fragmentation

Habitat fragmentation can affect the health of populations. Cars can kill turtles crossing roads. Some solutions include creating road-crossing structures like culverts to allow for safe crossings. Alternatively, there could be trained citizen turtle ambassadors to help protect turtles on the road at times when they are most likely to cross.

Motorized Vehicles

Try to limit ATV and other off road recreational vehicle traffic in areas where there are reptiles and amphibians. Do not let heavy machinery in areas where there are sensitive habitats.

Land

Meadow

If fields can be mowed between November and February when turtles are least active, this would allow for the greatest amount of success in both turtle adults and hatchlings. When fields are mowed, go from the center in a circular pattern out would give the turtles on land a chance to escape damage from the machines. The mower blades be raised to 20- 30 cm (8-12 inches) to accommodate all turtles during their terrestrial phase. While some mortality cannot be avoided from aspects like the tyres, implementing cutter bar mowers over rotary and flail mowers can reduce it.

Human traffic should be kept to confined roads or trails to prevent sensitive habitat disturbance and soil compaction. Try to maintain connectivity between similar habitats. If possible try to maintain openness in canopy to serve as basking and incubation sites. Try to maintain diversity in plant and animal life and prevent the spread of invasive species.

Forest

Follow Best Management Practices for the dominant forest type. Try to restore native ground cover. Maintain deer populations with reasonable measures. There should be a good amount of woody debris left on the ground after storms or disturbances where space allows acting as a refuge for not only turtles, but a wide array of other insect, bird, and mammalian species as well. Try to leave it as natural as possible. Avoid fragmenting landscape when possible.

Talus Slope

Follow Best Management Practices to prevent erosion and soil disturbances from uphill. Use Best Management Practices to create buffers to protect significant sites and dispersal areas. Remove non-native species that are shading out areas that were once sunny. Monitor areas for reptile and amphibian dens.

Aquatic

River/Riparian Zones

Limit the amount of detrimental run off and activities that alter normal flow or temperature. Follow forest Best Management Practices. Stabilize the banks to allow access for turtles to upland sites. Avoid introduction of nonnative species. Don't allow the public onto a sensitive area. Limit poaching or killing any species of turtles. Try to avoid building roads in floodplains when possible. Ideally, leave snags in the water.

Small Streams

Implement forest Best Management Practices for streamside management zones. Limit containments that enter into the water. Minimize riprap as shore stabilization and avoid altering edges. If beavers are present, assess the effects and minimize numbers if needed. Leave snags and other debris down as microhabitats. Limit building roads over waterways. Do not alter the flow or natural processes. Remove exotic species.

Wetland

Do not lower water levels in the winter when turtles are in their hibernacula. Maintain connectivity between wetlands. Avoid changing the landscape by building or agriculture. Maintain natural succession patterns in the adjacent terrestrial ecosystem and at least a partial canopy cover. Try to keep waste out of the area. Do not let turtles enter into harmful areas when possible.

Estuarine/Costal

Remove garbage that could attract predators. Discourage pedestrian traffic in nesting areas during nesting season. Make safe road crossings for nesting females. Educate the public about how to safely engage with a turtle.

Public Knowledge

Locations of sensitive species sightings should be kept as privately as possible as there is a big issue of turtles being stolen and sold on the black market for thousands of

dollars. For example, wood, box, and spotted turtles are taken from their natural environments to become house pets. It is suggested that parks should have some sort of penal system for taking threatened species from county owned lands.

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