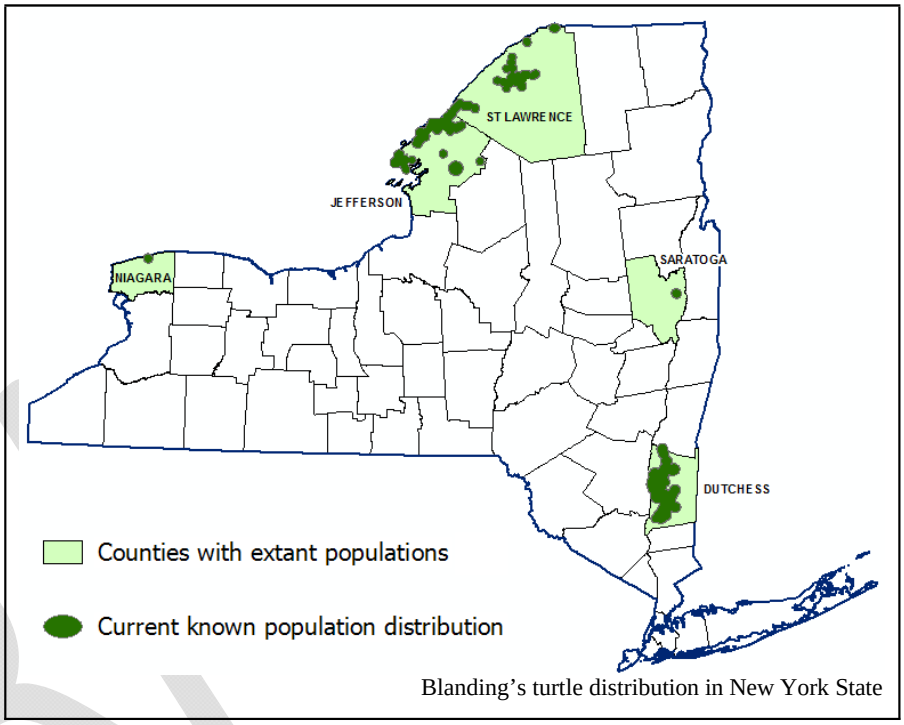
# Guidelines for Reviewing Projects for Potential Impacts to the Blanding's Turtle

The Blanding's turtle (*Emydoidea blandingii*) is listed as a *threatened* species in New York and is protected by Environmental Conservation Law (ECL) section 11-0535 and the New York Code of Rules and Regulations (6 NYCRR Part 182). A permit is required for any proposed project that may result in a "take", which includes, but is not limited to, adverse modification, degradation or destruction of occupied habitat of any species listed as endangered or threatened pursuant to the above laws and regulations. Blanding's turtles move through and/or utilize several habitat types. Aquatic/wetland habitats are used for hibernation, mating, feeding, shelter, estivating, and basking, while terrestrial habitats are used for nesting and seasonal migrations, as well as estivating, and basking. Although there is variation throughout the geographic distribution of the Blanding's turtle, terrestrial habitats can often be well over ½ mile from core wetland habitats, and an individual turtle's home range may be 50 acres or more (Grgurovic and Sievert, 2005, Hartwig *et al*, 2009).



Blanding's turtle distribution in New York State

## Impact Assessment Requirements

For project sites where: 1) suitable habitat exists on site, ***AND*** 2) there is a known Blanding's turtle population within 0.81 miles (4,224 ft)(1.3km), ***AND*** 3) the intervening land use between the project site and the known population(s) does not include any significant barriers (as determined by the NYSDEC), it should be assumed that there may be usage of the site by Blanding's turtles during some stage of the species' annual activity cycle. If a proposed project meets the above criteria, the project design will need to avoid alteration of suitable habitats and incorporate mitigation measures to prevent impacts to the turtles that would constitute a take under ECL Section 11-0535. Where the landscape will be significantly altered, mitigation is difficult and avoiding impacts may require detailed information about the Blanding's turtle population on the project site. Information required to assess potential project-related impacts on the Blanding's turtle may include: 1) habitat assessment [identify all suitable aquatic/wetland and upland habitats], 2) site usage [presence/probable absence], and 3) movement between various habitat types. A project specific impact assessment should be prepared and presented to the Department for review.

## Next steps:

If the NYNHP database indicates the presence of a Blanding's turtle population on or near a project location ***OR*** the Regional Permits office has determined that the potential for a take may exist, the following information-gathering process is recommended. Base on the information available and gathered, a project specific impact assessment should be prepared and sent to the Regional Permits office for review. Please consult your Regional Wildlife office for assistance with this process, as well as the Regional Permits office:

- If Blanding's turtles are known to use the project site ***OR*** it has been assumed that there will be usage of the site by Blanding's turtles during some stage of the species' life cycle - impacts to the species (see **Threats section below**) must be assessed and appropriate take avoidance, minimization and mitigation measures should be incorporated into the project design. If impacts cannot be fully avoided or minimized, a permit, mitigation and a net conservation benefit may be required. To assist with the assessment of impacts, a habitat assessment should be conducted to identify the presence of migration corridors and all suitable aquatic/wetland habitat(s) and terrestrial habitat(s) within the project boundaries.
- If Blanding's turtles are not known to use the site ***AND*** it will not be assumed that there will be usage of the site by Blanding's turtles during some stage of the species' life cycle, a habitat assessment should be conducted to identify the presence of migration corridors and all suitable aquatic/wetland habitat(s) and terrestrial habitat(s) within the project boundaries. Additional study may also be required to rule out use of suitable habitats by the species (See below).
    - If a habitat assessment indicates no suitable habitat(s) on site - no further surveys Blanding's turtles are necessary for the site at that time; however, based on project location, appropriate take avoidance measures may be required if individual turtles could encounter the project site during upland movements. Work with the Reginal permits office to determine if any take avoidance measures may be needed.
    - If the habitat assessment has identified suitable habitat(s) ***AND,*** as a result, usage of the site by Blanding's turtles is assumed - impacts to the species (see **Threats section below**) must be assessed and appropriate take avoidance, minimization and mitigation measures should be incorporated into the project design. If impacts cannot be fully avoided or minimized, a net conservation benefit will be required.
    - If the habitat assessment has identified suitable habitat(s) ***AND*** usage of the site by Blanding's turtles will not be assumed - survey(s) should be conducted to characterize site usage by Blanding's turtles. Results of the initial survey will determine whether additional data collection (e.g. turtle movement) and/or field seasons may be necessary for adequate project review by DEC. Appropriate take avoidance, minimization and mitigation measures should be incorporated into the project design based on the result of surveys. If impacts cannot be avoided, a permit, mitigation and a net conservation benefit will be required.

### Habitat Assessment

Due to the species' large home range and multiple habitat requirements, a habitat assessment (Kiviat, 1993, Hartwig *et al*, 2009) should be conducted to determine the presence of suitable aquatic/wetland habitats, upland habitats, and migration corridors within the project boundaries. Aquatic/wetland habitat usage by Blanding's turtles includes different types of freshwater systems such as emergent marshes, woodland pools, red maple swamps, buttonbush swamps, ponds, lakes, rivers, and streams. Juvenile Blanding's turtles are normally associated with shallower water and more densely vegetated habitats as compared to that of adults. Habitats

used for foraging and basking by Blanding's turtles of the southeastern New York population are typically shrub-dominated (particularly buttonbush), large, deep (1 - 4 ft), open-canopy wetlands. Uplands are an important component of a Blanding's turtle's habitat complex as they spend a substantial portion of the active season on land. During seasonal migrations, turtles of both sexes commonly travel overland through a wide range of terrestrial habitats with only temporary stopovers in re-hydration pools. During the summer, adults may also spend extended periods estivating in upland areas, including shrub habitats and forested edges. Gravid females require early successional upland habitats with specific soil characteristics in order to excavate nests into which their eggs are laid; suitable nesting sites may be several thousand feet from the core wetland. Terrestrial nesting habitat is characterized by loose, gravelly soil (often Hoosic) with sparse vegetation. In the fall, Blanding's turtles usually migrate to permanent wetlands where they hibernate until the following spring. Habitat assessments should be conducted by individuals that have knowledge of Blanding's turtle ecology.

**Population Surveys**

If a habitat assessment identifies suitable Blanding's turtle habitat and project-related impacts cannot be effectively mitigated, a population surveys should be completed. The purpose of these surveys is to determine the presence or probable absence, and if necessary, movement patterns of Blanding's turtles on the project site.

Presence/probable absence (Kiviat *et al.*, 2000) can be assessed both visually and by capturing turtles via traps, dip nets, and by hand (see **Live-trapping Surveys section below)**. After Blanding's turtles have emerged from winter hibernation and are starting to become active again (i.e. late-March through mid-April), it is possible to capture submerged turtles with dip nets or by hand. By May and throughout June, Blanding's turtles can often be observed basking in wetland habitats; binoculars or a spotting scope can be helpful in identifying turtles, particularly in larger, inaccessible wetlands. Total search time per person and/or trap hours per unit should be recorded for each location.

Identifying active nesting locations and turtle movement patterns requires the use of radio telemetry to record the location and behavior of several turtles throughout their annual cycle. Turtles should be tracked for at least 2 activity seasons: from initial capture to November 15 and from March 15 to November 15 of the second season. Turtle locations should be recorded every other day from April 15 to September 15, when turtles are most active on land. Turtle locations should be recorded once a week during the rest of the season.

In order to be reasonably certain that Blanding's turtles do not use a proposed project site, up to three field seasons of data collection may be required. If Blanding's turtles are using the site, at least 1 to 2 full cycles of data may be necessary to assess movement patterns. Contingent upon the data collection requirements of the project, a detailed scope of work should be developed by the project sponsor (in consultation with Department staff) and approved by the Department prior to the initiation of any field work. All Blanding's turtles population surveys should be conducted by individuals that have knowledge of the species' ecology, and surveys that may involve handling turtles (e.g. live-trapping, marking, and radio telemetry) must be conducted by individuals that have experience with such techniques and are licensed by New York State to handle Blanding's turtles.

**Threats**

The following list of threats is not intended to be all inclusive but serve as an example of potential threats generated by proposed projects on this species. Project specific threats should also be included in any impact analysis. Threats can be associated with construction activities as well as operation of facilities once constructed. Threats and impacts from these can be temporary in nature or more permanent.

- Loss of habitat - residential and commercial development eliminate occupied and available habitat.
- Habitat degradation
    - Destroying wetland habitats (e.g. draining, filling, ditching)
    - Change in water quality (e.g. chemical or fertilizer application, heavy road salt use,

stormwater runoff)
    - Alteration of surface or subsurface hydrology (e.g. stream diversion, construction of impoundments, groundwater wells)
    - Alteration of woodland pool habitat that function as refuges
    - Alteration or removal of aquatic vegetation
    - Residential and commercial development of upland nesting habitat
    - Residential and commercial development of movement corridors
    - New road construction separating wetland from upland nesting habitat
- Road mortality - aside from the direct loss of habitat, direct mortality from vehicles may be the biggest threat to Blanding's turtle populations.
- Fragmentation - connectivity between terrestrial habitats and aquatic/wetland habitats is essential for population maintenance.
- Placement of permanent barriers including residential and commercial development, stone walls, fences, parking lots, ditches or curbs that prevent Blanding's turtles from migrating between habitats increase direct mortality and decrease reproductive success.
- Collection - illegal collection for the pet trade is often a result of increased human presence near Blanding's turtle populations. Individual turtles are also collected as pets by people who are not knowledgeable about existing laws and regulations protecting the species.
- Subsidized predators - increased human activity near Blanding's turtle populations increases the potential for direct and indirect mortality from pets and subsidized predators (e.g. raccoons, skunks).
- Direct mortality of individuals during ground disturbance activities associated with residential, commercial, and infrastructure development and maintenance activities.

## Impact Avoidance, Minimization, and Mitigation Recommendations

The following is a list of potential methods that may be employed to avoid, minimize or mitigate certain project-related impacts when habitat disturbance is temporary or small-scale; however, not all methods are appropriate for all projects. Where the landscape will be significantly altered, mitigation may be difficult and avoiding impacts may require detailed information about the Blanding's turtle population (population size, location, movements of individuals) on the project site. If the project will result in adverse impacts to individuals or habitat, an Article 11 Incidental Taking Permit may be required. Such a permit also needs to result in a Net Conservation Benefit ( i.e., a successful enhancement of the species' subject population, successful enhancement of the species' overall population or a contribution to the recovery of the species within New York. To be classified as a net conservation benefit, the enhancement or contribution must benefit the affected species listed as endangered or threatened in ECL Article 11-0535 Part 182 (6NYCRR Part 182) or its habitat to a greater degree than if the applicant's proposed activity were not undertaken) to the species. See the Regulations for more information on permitting and contact your Regional offices for more information or to receive a jurisdictional determination as to whether your project is subject to regulation.

***Take Avoidance:*** The following measures are designed to avoid direct and indirect impacts to a species and its habitat. Proper implementation of these measures should avoid direct take of individuals during construction or operation of a facility.

Seasonal restrictions

All allowable disturbance activities, including movement of construction vehicles, excavation, and alteration of vegetation, should be conducted during the period when the turtles would be expected to be hibernating and are less likely to be directly impacted by above-ground disturbances. The active season (i.e., acceptable work period) is generally from October 16th through April 14th, but dates may be more restrictive based on weather – discuss with your Regional Permits Office.

Habitats that are actively managed (e.g. mowing, prescribed burning, tree removal) may increase mortality as turtles may be killed by machinery or incinerated by fire. Most vegetation

management activities should also be conducted within the acceptable work period to minimize the potential for injury/death of turtles. Prescribed burns that must be done outside of the acceptable work period should be conducted after early spring dispersal from overwintering sites or in late fall after hatchling dispersal from nests. To protect gravid females, active nests, and hatchlings, no prescribed burns (or other high-disturbance management activities) should be conducted between May 15th and September 30th, but dates may be more restrictive based on weather – discuss with your Regional Permits Office.

The intent of these seasonal restrictions is to avoid activities during the species active season, thus avoiding the chance of direct take of the species during the project activities. The location of the project and type of project proposed influences whether or not seasonal restrictions would be an appropriate measure to avoid impacts to the species by your project. As noted below, impacts to occupied habitats should be avoided at all times of year.

Avoidance of Suitable Habitats

In addition to the seasonal restrictions applied to habitat management practices, disturbance to occupied Blanding's turtle habitats should be avoided at ***ALL*** times. Heavy equipment and site preparation work (e.g. disk-harrowing, shearing, root-raking), as well as the location of logging roads skid trails and landings should be kept at least 330 feet from all potentially suitable aquatic/wetland habitats including woodland pools. Any tree cutting within 330 feet of aquatic/wetland habitats should be done by hand-felling, and tree removal should be done by winching unless harvesting is taking place outside of the active season. Canopy cover surrounding woodland pools should be retained at no less than 75% from the edge of the pool out to 100 feet. Beyond 100 feet and out to 330 feet, the canopy cover should be retained at or greater than 50% (Calhoun and Klemens, 2002).

Project lay out should avoid all identified suitable habitats and maintain adequate buffers between proposed perment disturbance and the occupied habitats.

Temporary barrier

If it has been determined that upland habitats on the project site are not likely to be Blanding's turtle nesting habitat, but turtles could still move through the area, a temporary restrictive barrier may help to avoid direct impacts to individuals if installed around the perimeter of the disturbance footprint of small projects (< 1 acre). The barrier should be: 1) installed outside of the active season and maintained until the end of the construction phase of the project or until the end of the active season, whichever occurs first^, 2) inspected daily and, if necessary, repaired immediately to a fully functional condition*, and 3) constructed in accordance with the following design specifications:

- Made of fine-mesh (¼ inch square) filter-fabric or non-woven geotextiles
- A minimum of 42" high
- Anchored into the ground with reinforcement bars placed on the "disturbance side" of the barrier and spaced between 6 – 8 feet apart.
- Secured at the base (barrier/ground interface) with at least 8" of fence material covered with soil backfill

Temporary barriers would work best to keep turtles out of small work areas that are not determined to be occupied habitat. If the project also involves adverse modification of known or potential nesting habitat, impacts would need to also be minimized, and potentially mitigated. The barrier fence is intended to keep

turtles from entering a work area and thus avoiding direct mortality and take. If this measure is proposed, information related to its implementation should be included in the proposal.

^ If the temporary barrier needs to be installed during the active season, this should be done under the supervision of a Licensed monitor. The monitor should also sweep the area enclosed in the barrier and sign off on the barrier and the enclosure before work can start.

* The effectiveness of the barrier will be diminished, and turtles may be able to gain access to the disturbance area if debris (e.g. tree limbs, soil) is allowed to overtop or pile up alongside of the barrier.

Trap hazard protection:

In addition to mentioning these in any assessment narratives or text, details should be provided within project plans and plan notes where appropriate.

- Water control structures, such as drain-pipes, may create a trap hazard to Blanding's turtles. To prevent entrapment of Blanding's turtles, the storm drain grates should be designed with the smallest possible grate opening without compromising safety or necessary flow rate.
- Below-ground swimming pools should be surrounded by fencing to exclude turtles of all age classes. Fine grade wire cloth (1/4-inch square mesh size) at the base of a picket fence or a permanent 10" - 12" high concrete barrier can be used to prevent turtles from traveling into the hazard area.
- Window wells should have grates (1-inch square mesh size or less) or permanent 10" - 12" high vertical concrete barriers surrounding the well.
- Any excavation work done between April 15$^{th}$ and October 15$^{th}$ should be backfilled on the same day as excavated ***OR*** ramps (30$^{o}$ angle maximum) should be placed inside the excavation to enable turtles to climb out.

***Minimization:*** If these measures are implemented properly they will minimize the potential for negative impacts or reduce the total negative impact of a project.

Blanding's turtle monitor

For projects that include actions having the potential for direct injury/mortality to Blanding's turtles, an on-site monitor may minimize project impacts. The monitor must be a qualified biologist that has knowledge of Blanding's turtle's ecology and relocation procedures; the biologist must also have experience handling Blanding's turtles and be licensed by New York State DEC to do so.

The monitor's responsibilities should include:

- Conducting reconnaissance surveys for Blanding's turtles within the work area prior to the initiation of any disturbance activities, temporary barrier erection, and relocating turtles as required
- Training all personnel working at the site to be able to identify and locate Blanding's turtles,
- Monitoring the proper placement and maintenance of temporary restrictive barriers
- Maintain a presence and provide oversight during the disturbance phase of the project

Education and Encounter Plan

All contractors and workers should be provided appropriate training on the possible presence of protected turtles and steps to take if turtle is encountered during the construction or on the project site. The Educational material should include information on the protected status of the species in New York, what Blanding's turtles look like, and detail the appearances of other common species that may be encountered. The Encounter plan should spell out the steps to be taken if a turtle is encountered during

construction and should include stoppage of work, who is notified, what the next steps would be, if the turtle needs to be moved, who will be contacted, and conditions under which work may resume in the area.

Road hazard protection

New road construction should be avoided or, if necessary, minimized to the maximum practicable extent. If the layout and design of roads must be constructed in close proximity to core habitat, they should only be considered after sufficient Blanding's turtle nesting and movement data has been collected. These data should then be used to avoid placement of roads in travel corridors as well as known ***AND*** high-potential nesting locations (Lang, 2000). Where roads may intersect travel corridors, it may be possible to maintain established routes by using barriers with underpasses (Beaudry *et al.*, 2008) or culverts (i.e., herp tunnels). For secondary roads in residential developments, speed restrictions, barriers to funnel turtle turtles into underpasses, and "turtle crossing" signs may be necessary.


Wetland buffer

To minimize the potential for impacts on hydrology and water quality, as well as changes in plant community composition, a 330 foot "No Disturbance Zone" should be maintained around all wetlands that are known to be used or that have the potential to be used by Blanding's turtles. The No Disturbance Zone should prohibit all significant disturbance activities including those listed below (U.S. Fish and Wildlife Service, 2001).

- residential or commercial development
- construction of roads or parking lots
- placement of sewer lines, septic systems, or utility lines
- placement of storm water or sedimentation basins, or ground water wells
- herbicide, pesticide, or fertilizer application
- blasting, mineral extraction, or oil/natural gas drilling and refining

***Mitigation (off setting impacts) and Net Benefit:*** If a project proposal will not fully avoid and minimize all impacts to a species and its habitat, additional mitigation (off setting) and net benefit projects may be required. These projects or proposals would be judged based on the scope and scale of the impacts from a particular project. Below are some potential options, but not an exhaustive list. *Net conservation benefit* means a successful enhancement of the species' subject population, successful enhancement of the species' overall population or a contribution to the recovery of the species within New York. To be classified as a net conservation benefit, the proposed activity must be a successful enhancement of the species' subject population, successful enhancement of the species' overall population or a contribution to the recovery of the species within New York. To be classified as a net conservation benefit, the enhancement or contribution must benefit the affected species listed as endangered or threatened in ECL Article 11-0535 Part 182 or its habitat to a greater degree than if the applicant's proposed activity were not undertaken.

Habitat creation

Where potentially suitable landform, substrate and hydrology exist, the creation of wetland and/or terrestrial nesting habitat may be possible (Hartwig and Kiviat, 2007). Any habitat creation proposals should also be accompanied by and management plan that outlines how the created habitat would be maintained as such long term. The proposals should also include information on the biological/ecological

reasoning behind the location selected, type of habitat, and proposed size.

Habitat protection through fee purchase and conservation easement.

The habitat protected should be suitable habitat or known to be occupied or could be occupied by the species (be in the species range). Any easement language should be reviewed and approved by the Department. The habitats would likely also need to be monitored and maintained into the future.

Modification of ongoing or routine Agricultural Practices to add protections for the species:

Blanding's turtles are attracted to freshly tilled farm fields for nesting. Based on the agricultural practices these nesting locations could result in the take of nests or impacts to the success of the nests. Ongoing routine agricultural practices (Active in the past 7 years), are exempt from the need for permitting through 182.13. Instituting practices that avoid or minimize impacts, and a way to ensure these practices are maintained, could be viewed as benefit to the species.

Providing support for efforts or funding to implement actions of a species recovery plan:

The proposal should clearly outline which action is being supported or funded, how, and who would be implementing the action. Reduction of threat to the species should be explained.

Additional Study or Research Proposals:

Studies undertaken in relation to the project and permit issuance would not be regarded as mitigation or net conservation benefit for the project. However, conducting or supporting a study of an element of threat or impact to the species to produce a meaningful outcome and further protection of the species through the work conducted could be considered. Studies should address threats outlined in the NY State Management Plan, management plans for long-term monitoring sites developed by NYSDEDC or the NY State Wildlife Action Plans and the result of the study should provide a practical solution to a threat that can be mitigated and result in a net conservation benefit to the species.

**Live-trapping Surveys** [survey methods are based in part on Congdon and Keinath, 2006, Blanding's Turtle (*Emydoidea blandingii*): a technical conservation assessment; and Hudsonia Ltd. Hoop Trapping Protocol (Pagano *et al.*, 2007)].

- Hoop traps (2.5 feet hoops with 1inch square mesh) should be set in all suitable trap sites within the action area of the project. A suitable trap site (STS) is defined as "any wetland habitat(s) having a minimum water depth of 10 inches".
- Traps should be placed deep enough in the water so that the entire funnel entrance, and at least part of the bait, is below water. The top 6 inches of the trap should remain above water in order to allow trapped animals the ability to breath.
- Traps should be baited with plain sardines in soybean oil.
- Traps should be checked and baited once per day.
- All trapping should be conducted between May 15th and June 15th.
- Traps should be operated at each STS for a minimum of 10 trapping days (i.e. ten 24-hour periods) per annual activity cycle.

**Jurisdictional Determinations.**

To determine if an action will result in a take of listed species, a project sponsor should submit information to the Department's Regional Permits office for an Article 11 Part 182 Jurisdictional Determination. The information submitted should include project location, detailed information on what is proposed and any species survey information available for the site.
https://govt.westlaw.com/nycrr/Document/I0ee59d422d1f11e0ac150000845b8d3e?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)

**Related Resources and Links**

NYS DEC Conservation Plan for Populations of Blanding's Turtle (*Emydoidea blandingii)*

New York State Department of Environmental Conservation, Division of Fish and Wildlife, January 29, 2018 http://www.dec.ny.gov/docs/wildlife_pdf/blandingsplan.pdf

New York Natural Heritage Program

New York Natural Heritage Program. 2019. Online Conservation Guide for *Emys blandingii*. Available from: http://www.acris.nynhp.org/guide.php?id=7508

NatureServe Explorer

NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer.

U.S. Environmental Protection Agency

EPA. 2004. Protecting Wetlands for Amphibian and Reptile Conservation. www.epa.gov/owow/wetlands

NYSDEC

New York State Department of Environmental Conservation, Division of Fish, Wildlife and Marine Resources. 2006. Blanding's Turtle Fact Sheet. http://www.dec.ny.gov/animals/7166.html

Article 11 Part 182 Incidental Take Regulations:

https://govt.westlaw.com/nycrr/Browse/Home/NewYork/NewYorkCodesRulesandRegulations?guid=Ia8d30760b5a011dda0a4e17826ebc834&originationContext=documenttoc&transitionType=Default&contextData=(sc.Default)

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Calhoun, A.J.K and M.W. Klemens. 2002. Best development practices: Conserving pool-breeding amphibians in residential and commercial developments in the northeastern United States. MCA technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, New York.

Congdon, J.D. and D.A. Keinath. (2006, July 20). Blanding's Turtle (*Emydoidea blandingii*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/blandingsturtle.pdf [Accessed August 24, 2010].

Grgurovic, M., and P. R. Sievert. 2005. Movement patterns of Blanding's Turtles (*Emydoidea blandingii*) in the suburban landscape of eastern Massachusetts. Urban Ecosystems 8:201-211.

Hartwig, T.S, G. Stevens, J. Sullivan, and E. Kiviat. 2009. Blanding's turtle habitats in southern Dutchess County. Report to the Marilyn Milton Simpson Charitable Trusts and New York State Department of Environmental Conservation Hudson River Estuary Program. Hudsonia Ltd., PO Box 5000, Annandale, NY. 79p.

Hartwig, T.S., and E. Kiviat. 2007. Microhabitat association of Blanding's turtles in natural and constructed wetlands in southeastern New York. Journal of Wildlife Management. 71(2):576-582.

Kiviat, E. 1993. A tale of two turtles; Conservation of the Blanding's turtle and bog turtle. News from Hudsonia 9(3):1-6.

Kiviat, E., G. Stevens, R. Brauman, S. Hoeger, P.J. Petokas, and G.G. Hollands. 2000. Restoration of wetland and upland habitat for the Blanding's turtle, *Emydoidea blandingii*. Chelonian Conservation and Biology 3(4):650-657.

Lang, J.W. 2000. Blanding's Turtles, Roads, and Culverts at Weaver Dunes. Unpublished report submitted to the Minnesota Department of Natural Resources Nongame Wildlife Program. Unpaged.

Pagano, A., J. Holdsworth, and E. Belding. 2003. James Baird State Park Blanding's Turtles Monitoring Project. Unpublished report to the New York State Office of Parks, Recreation, and Historic Preservation, Environmental Management Bureau.

U.S. Fish and Wildlife Service. 2001. Bog Turtle (*Clemmys muhlenbergii*), Northern Population, Recovery Plan. Hadley, Massachusetts. 103 pp.