

**Phase 1 Bog Turtle Habitat Survey Data Form
For the Northern Population Range**

(Revised April 29, 2020)

Supplemental Information

Rationale: This data form, to be used by consultants and agencies staff with training and expertise in conducting Phase 1 bog turtle habitat surveys, is recommended to ensure consistency when collecting information on suitable hydrology, soils, and vegetation to help determine the presence of suitable bog turtle habitat. ***A separate data form is required for each wetland within the project action area.*** Attach **additional pages** if more space is needed.

Please note that this section does not need to be submitted to your local FWS Field Office or state wildlife agency – for surveyor use only.

***Information collected on the data form should be translated into a narrative form, included in **Phase 1 habitat assessment report**, and submitted to your local FWS Field Office and state wildlife agency for review. **Be sure to include any additional information/observations not captured on the data form that may be pertinent for agency review.**

***This supplemental information was taken from the *Guidelines for Bog Turtle Surveys for the Northern Population Range, Phase 1 and 2 Surveys* document (April 29, 2020). Please refer to that document should you need additional details about conducting a Phase 1 habitat assessment.

Bog Turtle Habitat Criteria

Compare your Phase 1 bog turtle habitat survey observations to the habitat criteria below:

Suitable hydrology. Bog turtle wetlands are groundwater/spring-fed with shallow surface water or saturated soils present year-round, although in summer the wet area(s) may be restricted to near spring head(s). Typically these wetlands are interspersed with dry and wet pockets, and there is often subsurface flow¹, overland flow², or surface runoff³ present at varying times of the year. In addition, small, shallow streams or rivulets (typically less than 4 inches deep) and/or flooded animal trails may be present that bog turtles will use to maneuver through a wetland. Bog turtles have also been observed inhabiting drainage ditches; therefore, ditches should not be overlooked during surveys.

Suitable soils. Usually a bottom substrate of permanently saturated organic⁴ or mineral soils⁵. These are often soft, mucky-like soils (this does not refer to a technical soil type as defined by Corps [1987]); you will usually sink to your ankles (3-5 inches) or deeper in muck. Although, in degraded wetlands or summers of dry years this may be limited to areas near spring heads or drainage ditches. In some portions of the species' range, the soft substrate consists of scattered pockets of peat instead of muck. For surveys in the Prairie Peninsula/Lake Plain Recovery Unit, Rosenbaum and Nelson (2010) describe

¹ Subsurface flow is described as precipitated water that flows through the soil just below the ground surface (Mays 2010).

² Overland flow is described as precipitated water that flows over the ground surface (Mays 2010).

³ Surface runoff is described as precipitated water that becomes subsurface flow, then discharges aboveground or flow on the ground surface (Mays 2010).

⁴ Organic soils are defined as "(1) saturated for prolonged periods (unless artificially drained) and has more than 30 percent organic matter if the mineral fraction is more than 50 percent clay, or more than 20 percent organic matter if the mineral fraction has no clay; or (2) never saturated with water for more than a few days and having more than 34 percent organic matter" (Corps 1987).

⁵ Mineral soils are defined as "consisting predominantly of, and having its properties determined predominantly by, mineral matter usually containing less than 20 percent organic matter" (Corps 1987).

soils as ranging from peat to muck, and note technical soil types that can aid in identifying potentially suitable bog turtle wetlands.⁶

Other technical soil types to consider: southeastern New York - Wayland silt loam, Sun silt loam, Palms muck, Catden (Carlisle) muck, Canandaigua silt loam, and Alden silt loam (MacDougall 2016). Massachusetts - Saco silt loam, Limerick silt loam, and Fredon fine sandy loam (Morgan 2008). Connecticut - Saco silt loam, Birdsall silt loam, Lyons silt loam, Peat and Muck, and Adrian muck (Warner 1988). Maryland - Hatboro silt loam, Baile silt loam, Codorus silt loam, and Glenville silt loam (Lee and Norden 1998; Chase *et al.* 1989). A site may not be excluded due to soil mapping as the species may occur in mapping units not listed above.

Suitable vegetation. The vegetation of bog turtle habitat varies considerably throughout the northern range and is strongly governed by geography, hydrology, soil chemistry, geology, land use, and ecological factors such as succession, beaver flooding, and grazing by domestic and wild herbivores. Wetland communities including fens, wet meadows, marshes, drainage swales, and shrub swamps can all contain suitable bog turtle habitat; and, in many instances, swamps or forested wetlands (*i.e.*, >50% canopy) are utilized by bog turtles if underlying hydrology and soil criteria are present.

Native vascular **flora commonly found** in suitable bog turtle habitat include sedges (*Carex*, *Scirpus*, *Eleocharis*), rushes (*Juncus*), grasses (*Leersia*, *Panicum*, *Poa*), cattails (*Typha*), ferns [sensitive fern (*Onoclea sensibilis*), cinnamon fern (*Osmundastrum cinnamomeum*)], and many forbs including tearthumbs (*Polygonum*), jewelweed (*Impatiens capensis*), arrowhead (*Sagittaria angustifolia*), skunk cabbage (*Symplocarpus foetidus*), white turtlehead (*Chelone glabra*), common boneset (*Eupatorium perfoliatum*), rough-leaved goldenrod (*Solidago patula*). Non-vascular plants (*e.g.*, peat moss (*Sphagnum*)) can be abundant.

Wetlands with a history of disturbance (usually agricultural) often contain a dominance of tall, aggressively competitive species, many of which are nonnative. Reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*), common reed (*Phragmites australis*), cattail (*Typha*), and to a lesser extent, sweetflag (*Acorus calamus*), are common invaders throughout northeastern wetlands and have been attributed to local declines and extirpation of bog turtles from many sites. Nevertheless, as a long-lived species, adult bog turtles can persist for many years in thickly overgrown, compromised wetlands that retain suitable hydrology.

In glaciated limestone regions of Connecticut, Massachusetts, New Jersey, New York, and Pennsylvania, calciphilic 'fen-indicator' flora are often dominant and may include shrubby cinquefoil (*Dasiphora fruticosa*), yellow-green sedge (*Cyperus esculentus*), woolly-fruited sedge (*Carex lasiocarpa*), Porcupine sedge (*Carex hystericina*), inland sedge (*Carex interior*), smooth sawgrass (*Cladium mariscoides*), grass-of-Parnassus (*Parnassia glauca*), alder-leaved buckthorn (*Rhamnus alnifolia*), and eastern red cedar (*Juniperus virginiana*).

Woody species commonly encountered in bog turtle habitat include alder spp. (*Alnus*), red maple (*Acer rubrum*), American elm (*Ulmus americana*), swamp rose (*Rosa palustris*), shrub willows (*Salix*), Viburnum spp., and in calcareous regions, eastern tamarack (*Larix laricina*). Nonnative, invasive shrubs including multiflora rose (*Rosa multiflora*) and buckthorns (*Rhamnus*, *Frangula*) can often also be dominant.

⁶ Soils in the Prairie Peninsula/Lake Plain Recovery unit are characterized by "an accumulation of saturated organic soils ranging from only slightly decomposed fibric (peat) through partially decomposed hemic (mucky peat) to more highly decomposed sapric (muck) soils varying in depth and underlying materials. Technical soil types mapped for these sites include Adrian muck, Carlisle muck, Chippeny muck, Edwards muck, Palms muck, Rifle muck, Muck-deep, and Humaquepts and Fibrists." Core samples revealed organic sediments to a depth of over 8 m and 13 m at two sites in this recovery unit (Rosenbaum and Nelson 2010).

Drought Index Information

Current drought or flooding conditions can be obtained by using U.S. Drought Monitor and Palmer Drought Index maps found at this website: <https://www.drought.gov/drought/data-maps-tools/current-conditions>. These maps can be consulted to determine long- and short-term drought and flood patterns that may indicate when surveys should not take place. For example, a drought intensity index of D1 (as shown in legend of U.S. Drought Monitor map) can indicate “moderate drought” conditions where areas generally saturated within a wetland may be drying up due to lack of precipitation. A D0 intensity index is not considered a drought, but abnormally dry conditions. If your area is within a D1 intensity index or higher (e.g., D2, D3, D4), it may be more difficult to effectively evaluate the habitat. The drought index should be considered and included in your report. The effects of flooding should be easier to determine, but even “moderately moist” conditions (light green shading on Palmer Drought Index map) can obscure potential habitat present. If unsure whether to conduct a survey based on these patterns, contact your local FWS field office and/or state wildlife agency for assistance.

Estimating Canopy Cover

Canopy cover can be estimated using the parameters in this table which were developed through the regional bog turtle monitoring effort. For the purposes of this data form, estimating percent cover is meant to capture the degree of canopy cover and shading of the wetland being assessed for the presence of potential suitable bog turtle habitat. Overhanging vegetation, even if the basal area is outside the assessment area, should be included in your cover estimation.

| % Canopy Cover |
|----------------|
| 0 |
| ≤ 5 |
| 6-20 |
| 21-40 |
| 41-60 |
| >60 |

Estimating Disturbance to Hydrology

Disturbance to hydrology can include the presence of drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver impoundment, evidence of flooding, etc. If possible, estimate the approximate time period that each disturbance observed occurred in to give agencies a sense of how recent the wetland has been altered.

| Time Period (in years) |
|------------------------|
| ≤ 5 |
| 6-10 |
| 11-20 |
| >20 |

Estimating Disturbance to Vegetation

Disturbance to vegetation can commonly include mowing, pasturing/grazing, and burning, among other activities. If possible, rate (on a scale of 1-4) the approximate level of disturbance you observe within the wetland based on the following parameters:

- 1 – Light to moderate (e.g., light grazing [1-3 animals per acre] or mowing during the inactive bog turtle season; vegetation of 6 inches or greater present;
- 2 – No grazing, mowing, or burning observed⁷;
- 3 – Moderate to high (e.g., overgrazing where vegetation is under 6 inches tall); OR
- 4 – Mowing during the bog turtle active season.

⁷ No grazing, mowing, or burning is given a “2” rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Conservation Zones

This section briefly summarizes the *Bog Turtle Conservation Zones* (dated April 18, 2001) document that can be used to identify projects with potential negative and/or positive effects on a project. Projects in and adjacent to bog turtle habitat can cause habitat destruction, degradation and fragmentation or can restore habitat for feeding, breeding and sheltering purposes. Of critical importance is evaluating the potential direct and indirect effects of activities that occur in or are proposed for upland areas adjacent to bog turtle habitat. Even if the wetland impacts from an activity are avoided (*i.e.*, the activity does not result in encroachment into the wetland), activities in adjacent upland areas can seriously compromise wetland habitat quality, fragment travel corridors, and alter wetland hydrology, thereby adversely affecting bog turtles. State and federal agencies use the following zones to assess impacts:

- Zone 1 - includes the wetland and visible spring seeps occupied by bog turtles. Bog turtles rely upon different portions of the wetland at different times of year to fulfill various needs; therefore, **this zone includes the entire wetland** (the delineation of which will be scientifically based), not just those portions that have been identified as, or appear to be, optimal for nesting, basking or hibernating. In this zone, bog turtles and their habitat are most vulnerable to disturbance, therefore, the greatest degree of protection is necessary.
- Zone 2 - the boundary of **this zone extends at least 300 feet from the edge of Zone 1 and includes upland areas adjacent to Zone 1**. Activities in this zone could indirectly destroy or degrade wetland habitat over the short- or long-term, thereby adversely affecting bog turtles. In addition, activities in this zone have the potential to cut off travel corridors between wetlands occupied or likely to be occupied by bog turtles, thereby isolating or dividing populations and increasing the risk of turtles being killed while attempting to disperse.
- Zone 3 - **this zone includes upland, wetland, and riparian areas extending either to the geomorphic edge of the drainage basin or at least one-half mile beyond the boundary of Zone 2**. Despite the distance from Zone 1, activities in these areas have the potential to adversely affect bog turtles and their habitat. This particularly applies to activities affecting wetlands or streams connected to or contiguous with Zone 1, because these areas may support undocumented occurrences of bog turtles and/or provide travel corridors.

Please refer to the *Bog Turtle Conservation Zones* (dated April 18, 2001)⁸ document for details on what types of project activities can cause negative and/or positive effects on a bog turtle wetland. **Include these details in the final Phase 1 habitat assessment report** you submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office for review.

Additional Considerations

- The Phase 1 survey should include all wetlands in the action area, and separate **Phase 1 Habitat Survey Data Form** are needed for **each** wetland. Contact your local U.S. Fish and Wildlife Service Field Office or state wildlife agency if you have questions about the extent of the action area for a particular project.
- As a reminder, landowner permissions may be needed if a portion of a wetland is outside project

⁸ For more information, please see: <https://www.fws.gov/northeast/bog-turtle/pdf/section-7-and-10/btconszone.pdf>

boundary.

- Soils are considered “mucky” if one can probe them to a depth of ≥ 3 ”.
 - Probing is done with an approximately 1" diameter, blunt-ended pole (*e.g.*, a plastic/aluminum broom handle).
 - Soils are considered “non-mucky” if one can probe them to a depth of < 3 ”.
 - Contact information for your local U.S. Fish and Wildlife Field Office and state wildlife agency can be found in Attachment 1 of the ***Guidelines for Bog Turtle Surveys for the Northern Population Range*** (April 29, 2020).
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