

CONSERVATION & MANAGEMENT PLAN

Franklin Bog Conservation Area
Henderson County, North Carolina

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The bog turtle prefers spring-fed palustrine wetlands that are organically rich but nutrient poor. Viable populations are dependant upon unfragmented riparian systems that permit the natural creation of bogs, fens, marshes, and wet meadows that offset natural succession. Unfortunately, only a few bog turtle populations fit into this ideal ecosystem in North Carolina because of habitat fragmentation, loss of habitat continuity along stream corridors due to natural succession, and the disappearance of the agents that created and/or maintained suitable wetlands.

In North Carolina most bog turtle habitat has been maintained in an early successional state by beaver activity, cattle grazing, or other anthropogenic activity. Beaver activity and the effects of browsers or fire are important in preventing canopy closure which is probably the most critical limiting habitat factor for the bog turtle (Nemuras and Weaver 1974).

Conservation and management of mountain and piedmont bogs and turtle populations have become necessary to ensure their long-term viability. Kiviat (1978) stated that bog turtle populations must either be provided with artificially stabilized habitats, and/or be given space to adjust to mosaics of unstable habitats. The following Vegetation Management Plan provides the techniques necessary to restore, enhance, and maintain core bog turtle habitat at Franklin bog.

This Conservation & Management Plan is divided into two main sections. The first section provides information concerning different management principles that can be used in controlling vegetation. The second section relates those principles specifically to Franklin bog.

HABITAT MANAGEMENT TOOLS

The following describes the various habitat management tools that can be utilized at Franklin bog. These include selective cutting, use of herbicides, and grazing. The use of fire to control woody vegetation at Franklin bog is not recommended because of the proximity of residential areas and buildings. In addition, extensive use of mowing is not recommended or likely possible because of the soft mucky soils over much of the wetland areas of the site. Mowing of the roadside areas may be possible. Additional details regarding these and other vegetation management techniques can be found in *The Restoration and Management of Small Wetlands of the Mountains and Piedmont in the Southeast* (Somers *et. al.* 2000).

Selective Cutting

Selective cutting is one of the more important tools to prevent canopy closure. Shrubs and small trees should be cut after the leaves emerge to prevent the storage of energy in the root systems. Early to mid-summer cutting of vegetation is recommended. Cutting with hand tools (clippers or loppers) or hand-held power equipment (chainsaw) is the most accurate method of trimming or removing woody vegetation. Cut material should either be removed from the site or chipped and the mulch scattered throughout wetland and upland areas.

Girdling large diameter trees is more beneficial than merely cutting them down. Bacterial and fungal diseases readily invade the girdled trees killing them to the roots. While the girdling process is slower, the long-term benefits are greater than felling trees and having to contend with offshoots and sapling growing from rootstock. Selective cutting should be scheduled at 3 to 5 year intervals, or on an as needed basis.

Herbicide Applications

In areas where vegetation is extremely thick or soft mucky soils preclude the ability to work it may be necessary to use applications of herbicides to control woody vegetation. The following provides a general discussion regarding use of herbicides at Franklin bog. Prior to using any herbicides additional information should be obtained to assist in the decision as to type of herbicide and method of application. Herbicides should be applied by a licensed applicator or an individual trained in their use and application.

Herbicides can be applied using a variety of techniques. These include, spraying, painting, and injecting. Spraying is most effective in areas where vegetation is relatively thick and there are not many non-target species present (i.e. thick stands of multiflora rose). The use of spray equipment allows for different combinations of nozzle type, orientation, and pressure to achieve the correct delivery and contact of the herbicide with the target plant. The use of non-toxic, wetland labeled dye can help to visualize where the spray goes.

Painting is often used in combination with selective cutting. Some woody species, such as red maple, are subject to sprouting and painting the cut stump with a herbicide can kill the roots and prevent resprouting.

Stem injection consists of making a cut into the bark down into the cambium with a sharp knife or ax. The cuts are made to encircle the stem. The cuts are then filled with a herbicide squirted from a bottle. The number of cuts or injections made in the stem controls the delivery of the herbicide. This technique is good to use on larger trees. The tree will be killed and can be left as a dead snag providing wildlife habitat.

Glyphosate and triclopyr are the most effective herbicides for controlling woody vegetation. Glyphosate is a non-selective systemic herbicide that may kill non-target partially sprayed plants. Triclopyr is a selective herbicide for broadleaf species. In areas where desirable grasses are growing under or around the target plants, triclopyr can be used without non-target damage. In all cases wetland or aquatic labeled herbicides should be used. These are herbicides that are relatively safe to use in wetland areas and will not harm wildlife if applied in accordance with the written directions.

Grazing and Browsing

Many bog turtle populations are associated with cattle grazing. Limited grazing as a management strategy is an important tool in maintaining wet meadows. Grazing in bog turtle habitats has shown to retard natural succession, control invasive species, augment hydrological

regimes by reducing above-ground vegetation and breaking up accumulated peat, create microhabitats for bog turtles in the form of hoof prints, and encourage the growth of hummocky vegetation that turtles use for nesting. Hooves break up the rootstocks of shrubs and allow sheet flow to be restored. Hoof prints also provide hiding places for bog turtles and other wetland animals and exposes mineral soil for seed germination. The benefits derived from grazing can far outweigh the negative impacts such as the trampling of plants and animals, compaction of soils, and additional nutrient enrichment.

Small herds of cattle, horses, or goats keep waterways open and prevent them from becoming weed-choked. Fall and winter grazing is recommended. Seasonal grazing is preferred to year-round grazing to prevent trampling of nests and eggs. It is important that the number of browsers using the habitat is kept under control. For beef cattle one animal per acre is recommended. Too many browsers may impact the habitat by eating rare plant species, compact the substrate, disrupt the natural hydrological sheet flow, increasing nutrient levels from excessive fecal loads, and trampling bog turtles and their nests.

Exotic/Invasive Species Control

Bog turtles are forced to emigrate when invasive plants threaten their habitat and create canopy closure. The most common invasive plant at Franklin bog is multiflora rose (*Rosa multiflora*). Control of this species is important because of the dense thickets that form closing the canopy. Herbicides are key control for multiflora rose but care must be used so that native species are not harmed.

Multiflora rose control

Multiflora rose reproduces by seed, root sprouts, and layering (rooting from the tips of arching branches). Flowers emerge from May to June and fruits develop in September through October. Its seeds are eaten and spread by birds and other animals. Seeds may remain viable in the soil for 1- to 20 years. Seedlings develop within 60 days at soil temperatures above freezing. Plants grow slowly for the first one to two years followed by rapid expansion through layering and root sprouts.

Highly infested areas may be cleared with a shovel or hoe provided that the entire rootstock is removed. For heavily infested areas mowing or spraying is the most practical method of control. Due to the soft soils found at Franklin bog use of herbicides is recommended for controlling the dense thickets of multiflora rose. Glyphosate and triclopyr are the most effective herbicides for controlling multiflora rose (Smith 1998). Apply a solution of 2% glyphosate or triclopyr and 0.5% nonionic surfactant to thoroughly wet all leaves. Use a low pressure and coarse spray pattern to reduce spray drift damage to non-target species. The air temperature should be above 65F to ensure absorption of the herbicide.

Glyphosate is a non-selective systemic herbicide that may kill non-target partially sprayed plants.

Triclopyr is a selective herbicide for broadleaf species. In areas where desirable grasses are growing under or around multiflora rose, triclopyr can be used without non-target damage.

In addition, the stems of multiflora rose can be cut at or near ground level and then immediately treated with a 25% solution of glyphosate or triclopyr. This treatment remains effective at low temperatures as long as the ground is not frozen. The basal section of the plant (ground to 12 inches) can also be treated with a solution of 25% triclopyr and 75% horticultural oil. After treatment wet the area thoroughly. This technique should be considered when treating individual bushes or where the presence of desirable species preclude foliar application.

HABITAT MANAGEMENT

Vegetation management is necessary at Franklin bog is ensure that shrubs and hardwoods do not encroach upon the core bog turtle habitat. The wetland to the east of the road has already developed to a point where it no longer provides suitable habitat for the bog turtle. Removal of woody vegetation in this area will return it to an open bog meadow habitat. Both a short-term and a long-term vegetation maintenance plans are proposed for the bog. The short-term plan will address immediate needs west of the road and will prevent the eastern wetland from losing core habitat. The long-term plan will discuss the management necessary to maintain both wetland areas as core bog turtle habitat.

Short-term Vegetation Management

The initial vegetation management that needs to occur at Franklin bog consists of removing woody vegetation that is or has encroached on the meadow bog and returning the vegetation to core bog turtle habitat. It is anticipated that the majority of the vegetation removal activity in the western wetland will occur during the first year. However, east of the road it will likely take 3 to 5 years to return this area to an open bog meadow habitat.

Western Wetlands

The western wetlands currently provide relatively good bog turtle habitat. However, several management activities need to take place to enhance the bog turtle habitat and prevent the wetland from becoming overgrown with woody vegetation. These actions are:

- Thinning of the existing alder thickets and removal of red maples
- Trimming and removal of trees and shrubs along the wetland/upland boundary, and
- Trimming and removal of exotics in the riparian buffer

There are two stands of alders in the western wetlands on the south side of Blythe Mill Creek. Thinning of the alder thickets should be undertaken manually by selective cutting and removal of alder clumps. The alder thicket should be thinned by 20 percent. Any red maple trees within the larger alder thicket should be girdled or removed. Smaller saplings can be removed while trees with a dbh greater than 4 inches can be girdled. Red maple trees that are girdled should also be treated with an herbicide to prevent resprouting.

A narrow band of trees and shrubs are present along the wetland/upland border. The multiflora rose within this border should be removed. Native trees and shrubs should be thinned by about 50 percent. Care should be taken when thinning, as some of the shrubs are poison sumac (*Toxicodendron vernix*).

A thin woody buffer along Blythe Mill Creek should be maintained to ensure stream bank stability; the width of this woody buffer should be minimized in order to maximize the potential bog turtle habitat. The maximum buffer width should be 20 feet and the minimum width should be 10 feet. Trees and shrubs outside the 20-foot width should be removed or girdled depending upon species. All multiflora rose within this buffer should be removed or killed by spraying with an approved herbicide. These activities should occur after mid June to avoid disturbing nesting turtles, and should be completed by early September to be most effective.

Eastern wetlands

The wetlands east of the road are primarily to the north and east of Blythe Mill Creek. An extensive stand of red maples and alder are present in the eastern wetlands. Removing these trees and shrubs to restore this area to an open meadow bog habitat preferred by bog turtles will require an extensive effort. This wetland area can be divided into several different areas. A portion of this wetland is extremely wet and is characterized by standing water and very soft mucky soils, while the portion towards the road and stream is less wet. Removal of woody vegetation in this area should be accomplished in several stages spread over several years. Because bog turtles are not currently known to utilize these wetlands there are no restrictions on when removal efforts can occur in this area. However, for herbicides to be most effective, treatment needs to occur from late spring to mid summer.

Because of the standing water and softness of the soils selective cutting and removal of the alder, red maples, and other shrubs in the wet portion will be difficult. To manage the vegetation in this area the following is recommended:

- Manually cut and remove alder around the edge of the wettest area that are easily accessible.
- Girdle and treat with an herbicide red maples and larger trees in the drier areas. Approximately one third of the trees should be treated, with all trees treated over a 3-year period.
- Treat stands of multiflora rose with an herbicide. This treatment will likely need to be performed for several years in a row to bring under control some of the dense stands in this area.
- Remove stands of alder in the drier areas. Several alder thickets should be left to provide shelter for wintering bog turtles. Alder that is manually cut should be removed from the site or chipped and the mulch spread across the site.

Removal of additional stands of alder in the wet area should be reevaluated after several years. Opening of the canopy of the adjacent areas may allow for the growth of herbaceous vegetation and tussock forming sedges that would allow for easier access to the wet areas.

Roadside vegetation

Tall herbaceous and woody vegetation that develops along the roadside areas and ditches should be mowed or bush-hogged. This should be accomplished by keeping the mower on the dry roadside area and not driving into the wetland areas. Keeping vegetation trimmed along the road will allow for monitoring of the bog turtle habitat from the road to help prevent poaching of the turtles.

An extensive stand of multiflora rose is present between Old Turnpike Road and Blythe Mill Creek east of the road. There is very little wetland area on the west and south side of the creek in this area. Because the stand of multiflora rose is so extensive it is recommended that this area be left alone and allowed to revert back to hardwoods.

Long-term Vegetation Management

The long-term vegetation management will be concentrated on maintaining the wetland areas as open bog meadows or core bog turtle habitat. The primary method of vegetation control will be through the use of grazers. However, it may be necessary to augment grazing with periodic selective cutting and use of herbicides.

Once the majority of the woody vegetation has been removed grazers will be used to help control wood vegetation. No specific recommendations as to type of grazers will be made at this time. Because of the small size of each wetland areas it will only be necessary to use one to two large grazers (cattle or horses) in each of the wetland areas. If smaller grazers such as goats are used then the number of grazers can be doubled or tripled.

The grazers should be introduced in late summer or early fall and can be allowed to graze through the winter. The grazers should be removed by early spring before the turtles become active. Grazing activity should be monitored and the grazers removed once they have fulfilled their duties. If areas appear to be overgrazed or show signs of harm the grazers should be removed immediately. After 3 to 5 years of grazing activity the use of grazers should be reevaluated to determine if they are effective in controlling woody vegetation and

It may be necessary to augment grazing activity with other vegetation control methods. The riparian buffer and upland areas should be monitored on an annual basis for the presence of multiflora rose. Multiflora rose stems that are found should be removed by grubbing to ensure that all rootstock is also removed.

Alder thickets that have been left within the wetlands should be thinned every two to three years. Thinning should consist of selective cutting of about 10 percent of the alder. All cutting should be removed or placed in brush piles in the upland areas depending upon the amount of cuttings generated. Any red maple trees growing in the alder thickets or along the upland/wetland boundary should be removed and the stems treated with an herbicide.

FENCING

As part of the vegetation management at Franklin bog it will be necessary to install fencing to help control and restrict grazing activity. Figure 2 shows the extent of the fencing that will need to be installed. Additionally it may be beneficial to install fencing to help restrict site access and to prevent bog turtles from crossing the Old Turnpike Road.

Fencing to control grazers should consist of three-strand barbed-wire fence. More substantial fencing is recommended along the road to prevent access to the site. In addition, the bottom portion of the fence along the highway should be lined with a six-inch high wire mesh to prevent bog turtles from crossing the road. This mesh should extend to the bridge to force the turtles beneath the bridge.

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