

State of the Refuge Habitat Report
(or Sort of a Habitat Management Plan)
for
Rappahannock River Valley, James River, Presquile
National Wildlife Refuges

April 2011

By Sandy Spencer, Refuge Wildlife Biologist



Shoreline Erosion of the Wilna Bald Eagle Roost on the Rappahannock River

Total acres

Fee: Easement:

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ACTION PRIORITIES for GRASSLAND MANAGEMENT

The following priorities are only a subset of all the needed actions described in this document.

- I. WILNA, HUTCHINSON, TAYLOE: Grassland Management
 - A. Prevent black locust and woody encroachment from the edges
 - B. Mow or burn annually, maintain firebreaks annually
 - C. Control infestation of thistle, lespedeza

These grasslands are provided according to CCP biological objectives for shortgrass and tallgrass species.

Shortgrass fields: The focal bird species for short grasslands is the grasshopper sparrow. Fields managed for this species: Wilna 1, 2, 3, 4, 6/7, 14, 15. *Very important that these fields be mowed or burned just prior to their return in mid-April so that the grass will be the appropriate short height during breeding season.*

Tallgrass fields: The focal bird species for these fields are wintering grassland birds such as savannah sparrow, migrating bobolinks, and during the breeding season, for turkey and bobwhite quail. Fields managed in tallgrasses: Wilna 8, 13; Hutchison 1-6; Tayloe 4 and 5.

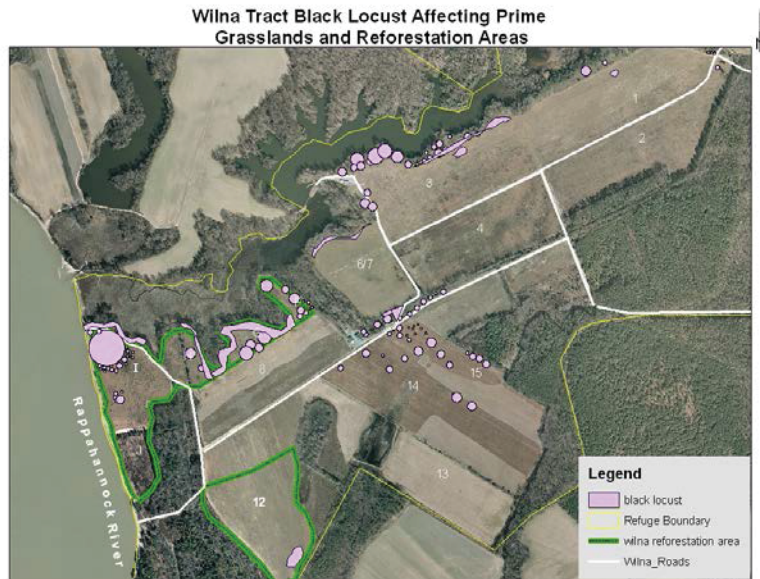
See map attached.

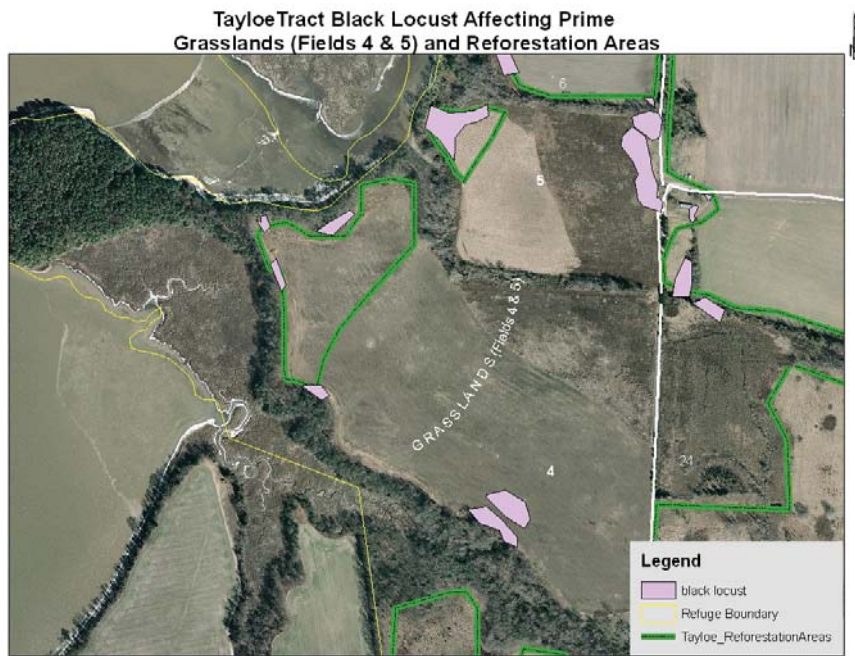
A. BLACK LOCUST/WOODY ENCROACHMENT CONTROL: High seed producers like black locust, maple, sweetgum, tulip poplar, sycamore constantly seed into the managed grasslands. Black locust is particularly problematic because it also forms clones of monoculture stands very quickly. Source trees in the edges of prime grasslands being managed for focal obligate grassland birds such as grasshopper sparrow pose a threat to the quality of the grasslands by quickly seeding throughout the adjacent grassland fields. Seeds easily sail over the annually mowed fire breaks surrounding the fields and establish in areas where grassland maintenance activity (brushhogging, prescribed fire) would not necessarily occur at a time that would set back or kill the woody invaders. For example, some fields would normally get a dormant season mow or burn every 2 years, enough time for trees to get well established and then when brushhogged or mowed, would not be killed and may leave stobs. Simply spot spraying each individual seedling is not efficient as there are hundreds of seeds dumped into the fields each spring from the parent trees, and many dozens of seedlings produced each season. Expensive chemical and limited staff time is better applied toward eliminating the problem on a more permanent basis. Locusts that pose less of a threat or are surrounded by dominating canopy competitors would be allowed to remain. See map below that shows the current locations where black locust control is needed for protection of prime grasslands at Wilna, Hutchinson, and Tayloe.

Suggested Actions:

- Mulch dense stands of young locusts and foliar spray resprouts; or use "Wetblade"®; basal bark spray applications; cut stump and hack 'n squirt.
- Spot treat with appropriate herbicide resprouts in the cleared areas; Very important to kill parent trees as these are the sources of locust infestations. Use basal stem application.

When: Spring (before end of May)





The photos below were taken of the fingers bordering wilna 8 in mid-April 2007 (Units F, G, H). These had been burned in early March 2007. Depicted are dense stands of young black locust, sweetgum, and blackberry. Mature oaks are leafing out in the background.



B. PRESCRIBED FIRE/MOWING REGIME FOR GRASSLANDS

The prime grasslands described above are susceptible to woody invasion and need to receive some sort of set back treatment annually. Best time to apply fire is late winter (late Feb - late March) in order to provide cover for wintering wildlife for as long as possible. Fire is needed to reduce thatch buildup which would prevent grass from regenerating, helps restore native species. However, fires are generally patchy in those portions of the fields that area dominated by herbaceous or forb species. Mowing (bushhogging) may also be needed.

DO NOT MOW/BURN BETWEEN APRIL 15 AND AUGUST 1 to avoid casualties to ground nesting birds (turkey, quail, grasshopper sparrows, etc).

C. THISTLE AND LESPEDEZA CONTROL IN GRASSLANDS

Canada and bull thistle, and Chinese lespedeza (*Sericea lespedeza*) quickly form monoculture stands and out-compete the native vegetation. Other species of concern are Japanese honeysuckle, trumpetvine (native, but not compatible). Thistle is a problem at all grassland fields; lespedeza is mostly at Wilna and Tayloe, with some minor infestation at Hutchinson.

Thistle: Spot spraying the thistle rosettes visible after a good prescribed burn is best, but not always an available option. Spot spraying as plants grow taller, more visible is a second option. Clipping seed heads is another option, although time consuming and only effective for very small patches. Bushhogging before plants start to flower is another option, but it only buys a little time before it grows up tall again. Also, there's risk of collateral damage to ground or field-nesting birds.

Lespedeza: This plant spreads quickly and forms large, contiguous clumps and shades out the grasses. It grows and flowers later in the summer. Best option is to spot spray since it won't be very visible until summer when birds are nesting. Contractors were hired in summer of 2010 to spray the lespedeza in Wilna 1, 2, 3, and 4. This will need to be continued as the plant produces a lot of seeds that remain viable for many years. A good burn would destroy the seeds, but burns are too patchy to expect good results by this method.

II. GENERAL INVASIVE PLANT SPECIES MANAGEMENT

This is an ongoing effort. In addition to the thistle, lespedeza, black locust in high priority grasslands described above, other species of focus in the uplands have been tree of heaven, multiflora rose, privet, Japanese stiltgrass, Japanese knotweed, black locust, thistles, lespedeza, autumn olive, Johnson grass, and kudzu. Non-native species are a threat to biological integrity and support of the food web, particularly to native insect larvae of important pollinators that can't recognize non-native species as food. Invasive species of concern in wetlands are phragmites and hydrilla. Phragmites cannot support a diverse insect fauna or bird community and may even alter hydrology over time as biomass builds up the peat layer; hydrilla is implicated in cyanobacteria that can cause avian myelinopathy (AVM) and well as oxygen depletion in the waterways.

The kudzu invading the fields at Styer Bishop is a priority effort because of the encroachment onto neighboring properties (although it originated from two neighboring properties). These are no longer priority grasslands because they are too remote and too narrow. Maintenance resources cannot reach that area frequently enough to keep up with bushhogging and other needs, so a decision was made by refuge management to allow the grassland portions of Styer Bishop to undergo natural succession into riparian forest. However, present patches of kudzu in existing tree lines would quickly cover over any new young trees. The grassland area should be kept open to allow big equipment (boom sprayers) to efficiently spray the large patches, while truck sprayer or ATV sprayers tackle the kudzu in the margins and tight spots where a tractor cannot go. We have sprayed the kudzu at Styer Bishop with Transline for the past two years (2009, 2010) and plans are contained in the Farming Agreement for a third treatment in July 2011.

Neighbor Dr. Andrew Ball has been particularly helpful by bushhogging the field borders so that firebreaks can be maintained and to provide access for invasive species treatments. In 2008 and 2009, we allowed Dr. Ball to graze his goats on the kudzu. An electric fence was put up around 2 big patches in the grasslands. They devoured most of the northern patch, but would not travel through the tall grass to get to the 2nd, more southerly patch, even though a path was mowed for them. They were also fenced into the 4 acre patch on the north side of Millbank Road, and they successfully consumed most of the ground-level and reachable kudzu, so that staff could spray the higher kudzu in the trees. In the 2nd year, they escaped and Dr. Ball sold off his goats.

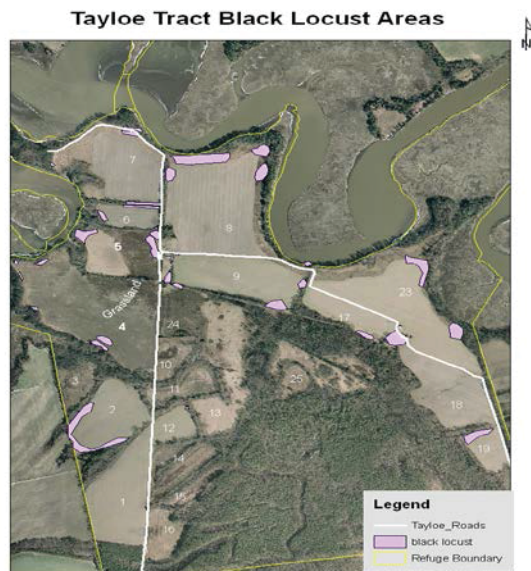
In 2010, Biologist Sandy Spencer made agreements with neighbors on west and north of property, Belle Grove and the Bourne family respectively, for them to work with us on controlling the kudzu in this area. Pete Gray, who farms for the owners of Belle Grove, said he does spray with RoundUp but that it hadn't been effective and would be willing to try Transline. Wayne Bourne, who originally said he likes the kudzu on his property because "it's good for his deer hunting", later changed his mind and gave Thomas Mundie

verbal permission to spray the 2 acres adjoining the refuge while Thomas was on site spraying. We need to get his permission for future spraying in writing. (It is actually his mother's property). A grant proposal was submitted in August 2010 and also in November for Challenge Cost Share for \$2,000 to fund the purchase of Transline and to pay for boomspraying. We did not get the funding. Suggest therefore that Pete Gray be given some Transline to spray the kudzu adjacent to and spreading into refuge property (sign volunteer or coop agreement?), written permission be obtained from Wayne Bourne (and mother) to spray the 2 acres adjacent to refuge property, and use farming agreement to spray kudzu in field. Refuge staff and resources will be required to bushhog field perimeters and riparian perimeter to provide access for truck sprayer to reach kudzu spreading into riparian forest. (Note: Need to resolve the question about FWS policy on volunteers or cooperators using their equipment on refuge property. Dr. Ball has been using his tractor and bushhog on refuge property, and we have engaged other neighbors to provide similar assistance elsewhere in the past. We allow our cooperative farmer to use his equipment on refuge property. Recently a neighbor of our Laurel Grove tract offered to help with bushhogging using own tractor and bushhog, but discussions about FWS policy led to a decision that we could not allow it without the volunteer completing the heavy equipment safety training.)



Because of the spread-out nature of Rappahannock NWR, it is difficult to treat all infestations on all tracts. Over the years, protecting the integrity of the prime grasslands (Wilna, Hutchinson, and Tayloe) has been the number one priority, followed by attention to riparian forest. Early detection, rapid response applies to mostly grasslands unless time and resources permits elsewhere. Some long-standing but relatively stable infestations have been allowed to remain in order to focus on more dynamic infestations. In some areas we are allowing eventual shading out by natural reforestation. An example of this is the Johnsongrass at Thomas, the Canada thistle in Field A at Hutchinson, and in the reforestation fields at Laurel Grove. Some areas we simply cannot get to because of remoteness. Japanese stiltgrass at the Wright tract is an example of this.

Relative to invasive species management is the pending termination of our farming agreement at Tayloe. The 161 fields enrolled in crop will come out of production at the end of 2013. Most of those fields are designated for riparian reforestation. However, there are many black locust trees lining the fields. Without ongoing disturbance related to crop production, these will quickly form dense monocultures of black locust at the expense of slower growing but more valuable to wildlife species such as oaks and cherries. Currently the farming agreement is being used to get rid of black locust. In April 2011, Rappahannock Friends Group helped the biologist to spray paint all black locust trees that could be found lining the fields, so that contractors, hired by our cooperative farmer, Lloyd Mundie, could treat them with Garlon 3A and Milestone in April 2011. They used a combination of either hack 'n squirt (frill method) or cut stump method.



The phragmites effort has been ongoing from 2002 until recently, when resources became decreasingly stretched to thin. Much of the infestation on the Rappahannock River is on private lands. However, a growing infestation of 200+ acres is on Island Farm F:/Habitat Management/Sort of a Habitat Management Plan (Sandy Spencer April 2011)

Marsh. This appears to be coming from Hoskins Creek across the river where there are solid stands of hundreds of acres. A more strategic approach other than partially spraying the acres at IFM is needed, and that would be going for the source at Hoskins. To do this, a partnership approach with Corps of Engineers (as this was brought in on dredge spoil) and the Essex County. The Essex County Administrator, David Whitlow, said he was very interested in partnership efforts to eradicate this stand of phrag, as long as it does not cost the county any money. Mark Mansfield is the USACE for this area for developing a plan and strategies for eradication which may involve elevation changes. USACE involvement is essential here, as this phrag was brought in on the dredge spoil used to create the wetlands at the mouth of Hoskins Creek.

Phragmites should also be eradicated from the Tayloe marshes in Cat Point Creek.

2010 was the last aerial spray effort conducted by Dept of Conservation and Recreation using WHIP funding for the upper Rappahannock River, according to Paul Clark. In 2010, DCR agreed to spray 50 or more acres for the refuge on Island Farm Marsh and on Tayloe using Habitat, targeting patches mapped by Biologist Sandy Spencer. However, the pilot missed most of the target patches on IFM and did not get all on Tayloe. The project also included phrag on private lands arranged between DCR and the landowners. WHIP funding will not be available after this year according to Clark. These spray efforts were conducted as part of a 5- year FWS/DCR Coop Agreement signed in 2006, slated to expire June 2011. Phragmites spray data is stored on the main biology computer.

A new partnership should be developed, in conjunction with seeking grants to fund effort to keep phragmites from spreading up into pristine creeks and overtaking to the extent that it has done so in the lower Rappahannock and coastal bay communities. Following are the objectives developed for Rappahannock for the Regional Phragmites Structured Decision-Making Workshop. These may provide a useful guide for future efforts at the station level:

1. Prevent further spread onto refuge lands from a large source population of Phrag on Hoskins Creek
 - Establish a partnership with COE, state, county and affected landowners to develop a multi-strategy approaches for the Hoskins Creek
 - Explore use of elevation changes, reintroduction of tidal flow, and strategic biomass removal coupled with appropriately timed herbicidal treatments.

- Explore and incorporate method(s) to prevent the spread of seeds and rhizomes released during Hosking Creek project
- Explore and develop plans for restoration by reseeding with appropriate marsh vegetation suitable for predicted elevations

2. Keep pristine areas pristine--Conduct aerial and surface herbicide treatments of small patches of Phragmites that are advancing into new, relatively pristine creeks or tributaries such as Cat Point Creek, Piscataway, Totuskey.

Develop "neighborhood" partnerships with landowners centered on the creeks where they have a vested interest in maintaining its quality. Empower "point persons" to assist with workshops, training, outreach, landowner contacts & permissions, hiring and funding of licensed contractors

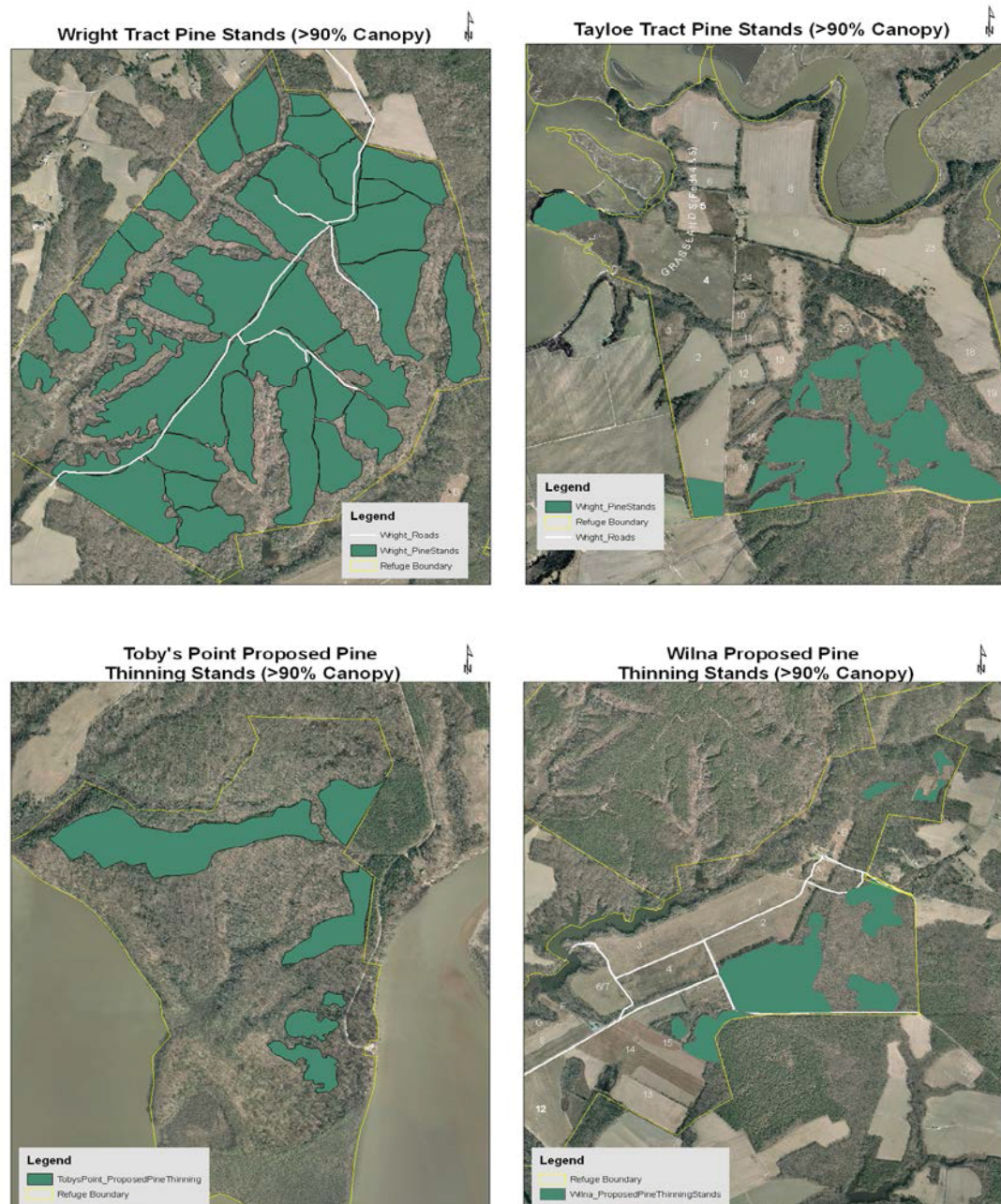
James River NWR is infested with Chinese privet and to a certain extent, tree of heaven, in the Maycock's Point area and the bald eagle roost. Eradication should be a priority ongoing effort as that in a bald eagle concentration area and the refuge was established to protect nest, roost, and forage sites for bald eagles. Where the privet formed monocultural stands in the open fields, this has been mulched down in place, by a contractor with special equipment, but young privet will and has begun resprouting. In the understory of the forested riparian border along the riverfront, privet has formed a virtual carpet about knee high. These will choke out and prevent recruitment of desirable trees favored by eagles for perching, roosting and nesting if not treated. Privet is difficult to kill, but with adequate labor and frequency, can be killed using the cut stump method (paint cut stump with appropriate herbicide for woody vegetation, such as Garlon 4 and Milestone VM).

Presquile NWR is also infested with invasives in the old field and along the riparian borders of this field. Within the field, the main invasives are Johnsongrass and Canada thistle. In the riparian zone, Chinese privet, tree of heaven, and autumn olive threaten the long-term quality of this bald eagle foraging and roosting site. The Johnsongrass and Canada thistle could potentially be eradicated by allowing the field to undergo natural succession into forest, but invasive woody species in the border may compromise this approach by overtaking before desirable, native trees can establish and dominate the canopy. Attacking the privet, autumn olive, and tree of heaven in the riparian zone should be a priority, ongoing effort for the near future.

III. FOREST MANAGEMENT AND RESTORATION

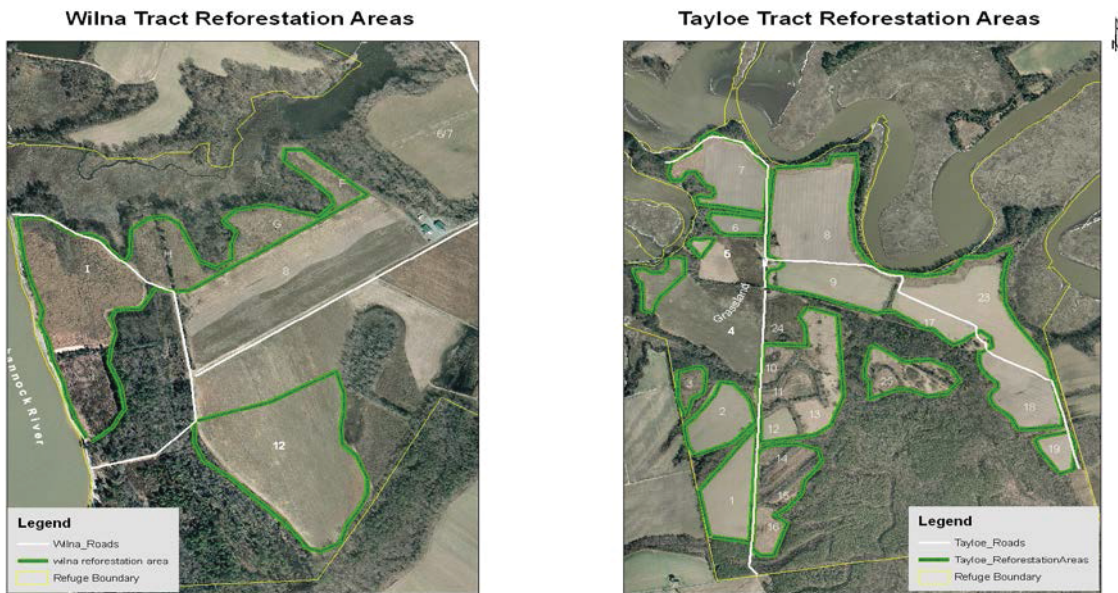
Most of the large forests of Rappahannock refuge tracts appear to be healthy, but when a funding opportunity presents itself for a timber cruise and health assessment, it should be taken.

Pine thinning: There are dense stands of single-age, monocultural, loblolly pines on Wright, Wilna, Toby's Point, Hutchinson, Laurel Grove, Styer Bishop and Peter tracts. These should undergo a thinning to open up the stands to allow light and regeneration of hardwoods such as oaks. A stand map for potential areas for thinning was prepared for the Wright tract in 2010. None have been prepared for the other tracts to date but the locations are obvious in aerial imagery. The Wright tract contains the largest acreage, about 521 of its over 800 acres. Because of the size of this stand, it should be a priority, followed by Tayloe and Wilna and Toby's Point.



Improve Forested Riparian Zones: Target areas where thin line of trees borders shores of creeks, ponds, wetlands. Widen these areas up to as much as 1,000', provided that it does not compromise another priority habitat, such as grasslands. Focus areas for this include Wilna riverfront Fields I and J. Wilna I has been problematic for this effort because of earlier and misguided restoration which entailed planting Blackwell switchgrass. The switchgrass became so dense that it suffocated trees that had been planted there. Efforts to thin the switchgrass by discing were ineffective because infrequent treatment. Prescribed fire had been used to reduce biomass and facilitate herbicidal treatment (by making the young regrowth more available to the spray), however, RoundUp failed to kill all the rhizomes. Suggest future herbicidal treatments using a grass specific herbicide such as Poast, or Journey, then planting older trees (larger root balls) spaced sufficiently to allow mowing between rows if needed.

Free riparian stands of Japanese honeysuckle or other vines strangling and suffocating young trees and preventing recruitment. If beavers are an issue, wrap desirable trees (oaks, cherries in particular) of differing ages in hardware cloth. This won't be practical everywhere, but certain areas could be targeted for such as Wilna Creek, particularly along the trail bordering the pond, and at Tayloe along Cat Point Creek.



IV. SHORELINE EROSION MANAGEMENT

Wilna Bald Eagle Roost Area—on the river shoreline at Wilna was once a wide swath of large trees that reached 50 beyond where it is today, according to neighbors, who also lost adjacent riverfront property due to erosion. Erosion and deposition are natural forces in any river and habitat was always available somewhere. This erosion would not normally be a concern here except that there is not another stand like this one within the Rappahannock River Important Bird Area, and most bald eagle habitat on the Rappahannock is on unprotected (from development, forest harvesting) private land. The IBA was designated based on high concentrations of eagles using this stretch of the river. Stands of large trees (not singletons) with big lateral branches and located close to excellent foraging (rivers, creeks with abundant fish) are in limited supply because riverfront tends to get developed into residential or large trees are harvested when they reach marketable age.

In 2007, shoreline experts came to Wilna from VIMS and from DCR Shoreline Management Office to evaluate the site for potential mitigation. Both independently arrived at same conclusion: a hybrid solution involved a rock marsh toe about 30 ft offshore, with backfill of clean sand to be planted in marsh grasses. Details of their recommendation and costs are in the file and on harddrive. There are cheaper methods, such as coir logs staked in place against the shallow bank, but this would be a short term solution.

A longer term solution requiring no site mitigation would be to allow erosion to continue while permitting natural forest regeneration on the uplands further back. Currently the bald eagle roost is backed by a forested wetland, which in turn is backed by a 35-acre former crop field that has been enrolled in the grassland management program for the past 5-6 years. Due to difficulties from woody invasion, as of 2011 this field will no longer be managed for grasslands except for a narrow strip along the road to buffer an adjacent grassland. Eventually the trees in this upland field may become a replacement roost site, as the lowlands and wetland below it recede. This site will increase in value as surrounding eagle habitat becomes degraded by incompatible land uses or forest harvesting.

INDIVIDUAL TRACT HABITAT NEEDS/ISSUES

1. Bower Hill

Brief Description

Acquired 10/27/2009, in Richmond County adjacent to Laurel Grove. About 260.0 acres.

Identifier: 62, R/Bower Hill. Some frontage on Farnham Creek. Bald eagle nest in 2008-09.

Mostly cutover in 2007 but about 50 acres of mature hardwoods remains on creekside.

Management Goals/Habitat Purposes

Maintain in hardwoods. Proximity to Laurel Grove forest augments the value of both forest, enhances interior acreage.

Habitat Management Issues of Concern

None known at this time.

Needed Actions

None known at this time.

2. FRANKLIN

Brief Description

Acquired 11/09/01. 107.43 acres. Richmond County. Tract 11d/Franklin Tract, headwaters of Little Carter Creek, former agricultural land restored to hardwoods.

Management Goals/Habitat Purposes

Allow open fields to undergo natural succession into forest. Maintain as mixed hardwood forest habitat.

Habitat Management Issues of Concern

None known. Surveillance for invasive species.

Needed Actions

Keep access from rear of Northern Neck Seafood, to forest edge open. Check culvert for washout. Check for invasives. Check progress on natural succession of open fields.

Insert photo here.

2. HUTCHINSON

Brief Description

Acquired 06/20/01, is approximately 727.35 acres in Essex County. Identifier: 11c/Hutchinson. Mount Landing Creek frontage, former agriculture lands restored to native warm season grassland and hardwoods just prior to acquisition. Has 130 acres marsh, about 400 acres of mature hardwoods, about 200 acres in grasslands, and some deep ravines with occasional waterfalls. Located on US 17, just north of Tappahannock. Good site for public use events. Accessible walking trails, canoe launch and fishing pier installed 2006 – 2009. Officially opened to the public in 2009.

Habitat Management Goals & Purposes

Maintain approximately 200 acres in grasslands, allow areas replanted in trees to reforest (see map), and continue to provide riparian, marsh, and forest interior habitat for waterfowl and migratory landbirds. Bobwhite quail is abundant in the grasslands on this tract.

Habitat Management Issues of Concern

INVASIVE SPECIES such as black locust, tree of heaven, princess tree, privet, kudzu, and Japanese honeysuckle are invading the grasslands and the reforestation fields, and in some places, the forest/field edges. Canada and bull thistle began invading the grasslands noticeably in 2008. Thistle and black locust management now dominates staff and volunteer invasive species focus to protect prime grasslands. See map above showing black locust focus areas. Fields 3-6 are subject to scattered invasion by Tree of Heaven (singles). Field A (reforested) has widely scattered occurrences of Tree of Heaven and Princess Tree, and a sizeable patch of kudzu covering trees on the southeast pocket of this field. Access to infested areas in Field A is impeded by dense shrub & vine growth or tall grass. Decision made in 2009 to allow reforestation to shade out the Canada thistle growing there. Field D is heavily infested with Princess Tree and sweet gum, which shaded and outcompeted most of the planted trees. A broad patch of J. honeysuckle is spreading from the junction of Fields D, 4 and 6.

WOODY ENCROACHMENT INTO GRASSLANDS AND FIREBREAKS—the margins of the fields are prone to encroachment by trees, especially black locust. If not tended to annually, their rapid growth and spread makes it increasingly difficult to control and forms nodes from which rapid spread into the interior occurs.

Needed Actions

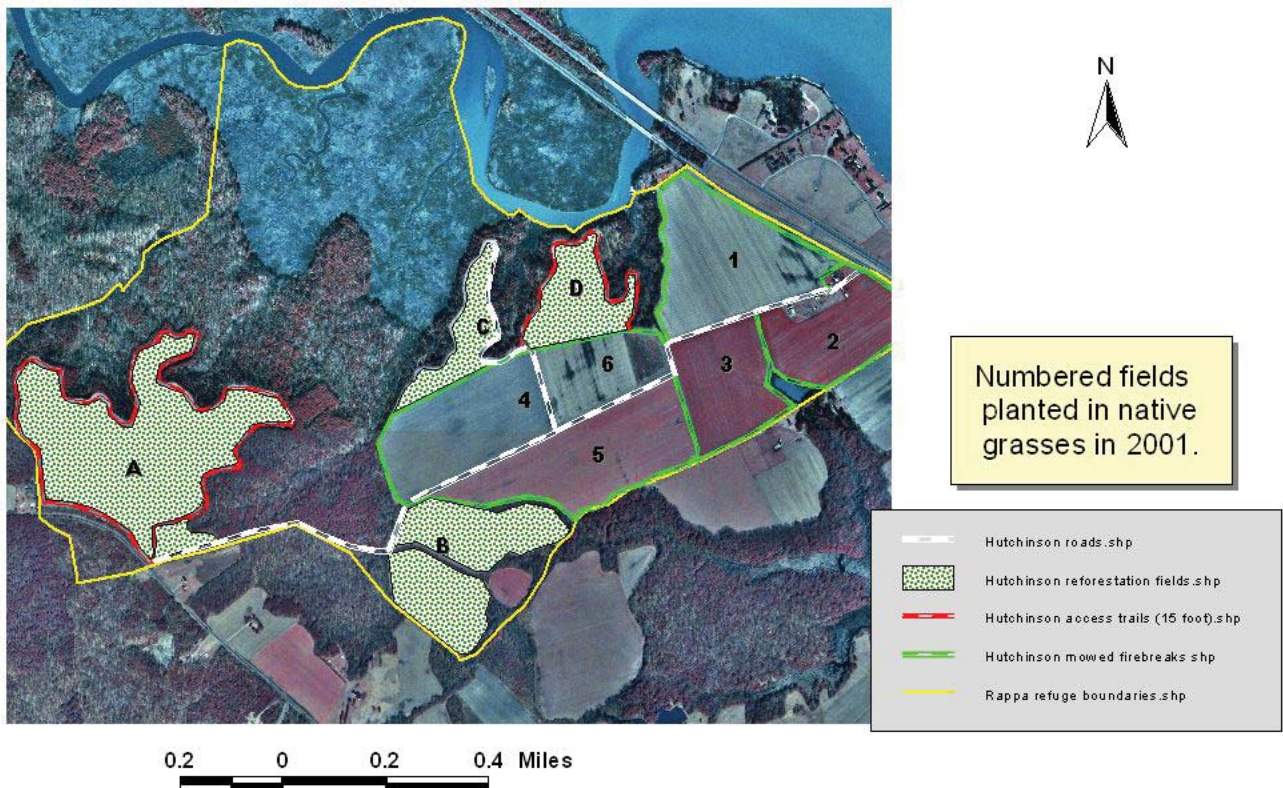
- *Annually* mow firebreaks (10') to prevent trees from growing to a size which can create tire-puncturing stobs. Best time to mow to both kill & remove above-ground tree biomass, yet not

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endanger nesting birds is late August or September. However, firebreaks may need to be mowed again just prior to a scheduled burn for certain fields.

- Loss of grassland acreage--The grassland field 4 is heavily encroached upon by sweetgum invading from Field C (reforestation field)
- Continue to spot treat invasives in fields with appropriate herbicides. Monitor and treat phragmites in emergent marsh.
- Maintain grasslands through prescribed fire (winter, dormant season burns to remove biomass, return nutrients to soil) every 2 years; bushhog between burn years or any portions of fields not successfully burned. Spot mow for trees and to create structural variety in the tall grasses.
- Maintain access routes around reforestation fields to facilitate invasives management and future trails (routes can be narrower than firebreaks).

Hutchinson Habitat Management Units, ' Firebreaks, Access Routes



3. ISLAND FARM MARSH

Brief Description

Acquired 02/02/04, in Richmond county, approximately 829.30 acres bordering Little Carter Creek and Rappahannock River. Lies at the foot of the bridge to Tappahannock. Identifier: Tracts 36, -I, -II, -III/Island Farm. One of the largest marshes on the River, about 40 acres in (8) forested islands of loblolly pine. Unimproved road/causeway leads to old hunting camp. Only other access is by boat. Potential for waterfowl hunting. Site of rare population of breeding Coastal Plain Swamp Sparrows. Also seaside sparrows and marsh wrens breed there. Important for winter waterfowl, especially American black duck. Has one, potentially two, active bald eagle nests.

Habitat Management Goals & Purposes

Manage as tidal brackish marsh habitat.

Habitat Management Issues of Concern

INVASIVES SPECIES CONTROL---Patches of Phragmites occur throughout the emergent marsh stands and line the interface between the forested islands and marsh. Many of the latter areas are inaccessible, either by boat or by land, and overhanging trees prevent overhead spraying by helicopter. These areas might be accessed by a suitably- sized marsh master or equipment that can float and carry herbicide. Phragmites coverage was dramatically revealed by a mapping effort conducted by DCR as part of a coop agreement with FWS.

ACCESS FOR BIOLOGICAL SURVEYS—Road into the marsh is washed out. Access to marsh for marshbird or winter waterfowl surveys in the shallow tide pools and tidal guts is difficult.

Needed Actions

- Explore and develop partnership with ACE, DCR, and Essex County to eradicate the source population of Phragmites at Hoskins Creek. This may entail altering the elevation and hydrology of the Hoskins Creek Phrag stand, which is not a natural marsh but a dredge-spoil site. ACE would have the capacity to undertake such an effort.
- Explore feasibility for spraying using a Marsh Master (tracked, floatation equipment)
- Continue to spray reachable stands by any means available.
- Repair/replace culvert on road.



Aerial photo of Island Farm Marsh (marshland to right of bridge). Photo by Bryan Watts.



KENNEDY TRACT

Brief Description

Acquired 04/04/08, in Richmond County. About 178.0 acres. Identifier:13a/Kennedy Tract. Fee title purchase with MBCC funds. 5,620' frontage on Cat Point Creek, 1,189' frontage on Half Moon Gut, approximately half tidal marsh and half mixed hardwood forest, bald eagle concentration area.

Habitat Management Goals & Purposes

Maintain as riparian forest and emergent wetland habitat for bald eagles, marshbirds, wintering waterfowl and migratory corridor along Cat Point Creek.

Habitat Management Issues of Concern

None known at this time but monitor for phragmites invasions.

Needed Actions

None known at this time.

4. LAUREL GROVE

Brief Description

Acquired 03/31/03, about 463.00 acres in Richmond County. Identifier: 13/Laurel Grove. Farnham Creek frontage, over 240 acres in mature mixed hardwoods, former agricultural land restored to hardwoods with CBF, Bass Pro Shops, TCF, and PFF, freshwater pond is a potential public use site, deer hunting by permit.

Habitat Management Goals & Purposes

Manage as large block mixed hardwood forest.

Habitat Management Issues of Concern

INVASIVE SPECIES—English Ivy surrounding house yard and cloaking mature hardwoods. Friends group has cut vines clinging to trees. Ivy covering ground continues to pose a threat. Large stand of bamboo also in house yard, which Friends group and Native Plant Society volunteers have nearly eradicated. Mimosa escaping from house yard and spreading into reforested area on adjacent side. Canada thistle patches in reforested area on west side of tract. Difficult to access and transport equipment to this site. Decision made to allow planted trees to shade it out as it is not adjacent to any agricultural fields. Multiflora rose all along the road side of the house, but was killed in 2007 – 2008 and removed in 2010. Other assorted exotics line trails and edges but are not stand-replacing threats. See botanical surveys conducted by Marie Minor 2006 - 2007.

Because planted trees are still young, and lanes between them relatively narrow, site is not suitable for prescribe fire or mowing between tree lanes.

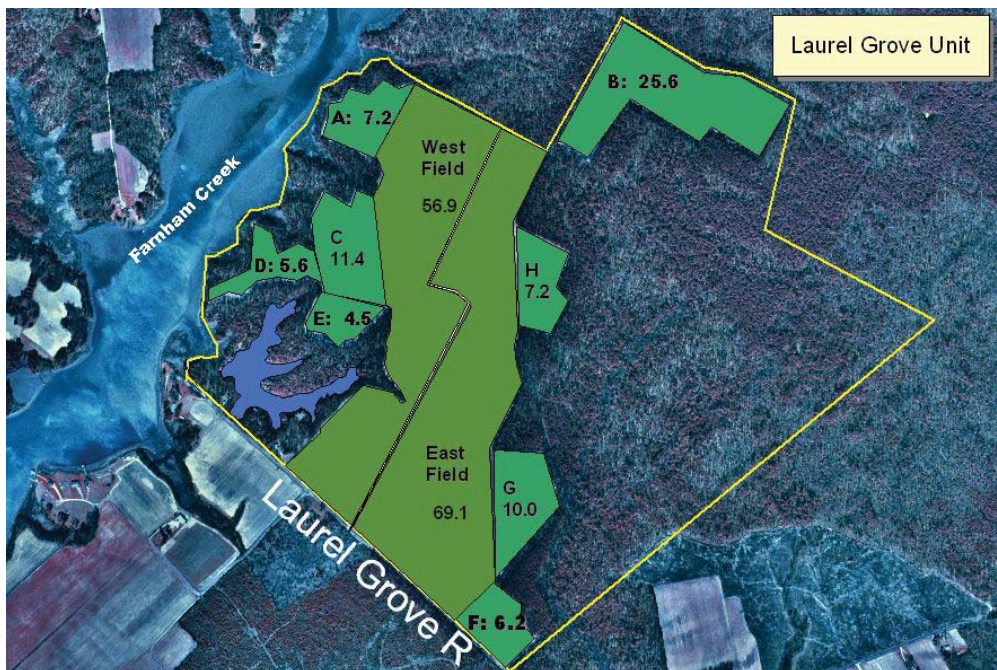
Needed Actions

- Continue to work with Friends group on efforts to manage and control invasives above. For ivy, best to cut with weedeater and immediately spray/paint the cut stumps with a glyphosate-based herbicide so as not to harm trees.
- Scout for invasives species in reforested area.
- Burn down old barns, old garage, remove/burn cut bamboo pile.
- Maintain forest trail from kiosk to field edge, along field edge toward road. Bushhog portion of the trail that goes through the open field and along forest edge annually.
- Install a beaver baffle in the outflow drain for the pond.
- Remove small trees on the levy of the pond; explore a more durable levy design.



Photo of Laurel Grove pond with rhododendron in bloom. Photo by Sandy Spencer.

Green polygons below are areas planted in native trees. When trees mature, this will increase the effective interior acreage of forest.



5. MOTHERSHEAD

Brief Description

Acquired 06/30/99. 227.03 acres. Westmoreland County. Tract 12c/Mothershead Tract, Riverfront, hardwood and shrub restoration in floodplain, former agricultural land reverting to, and maintained as, early successional habitat, deer hunting by permit

Habitat Management Goals & Purposes

Maintain the approximately 60 acres of former crop fields in early succession. Maintain the balance as mixed hardwood and riparian forest.

Habitat Management Issues of Concern

WOODY ENCROACHMENT/SUCCESSION—Fields have been allowed to undergo longer intervals without being subject to some kind of set back disturbance, hence they now have an oldfield-shrub habitat appearance. Each year more and more trees spread through the fields particularly on the eastern side.

INVASIVE SPECIES---Black locust stands are steadily advancing from southeast edge of the grassland fields (see vegetation map below). Already, a monoculture stand of sizeable trees about 5-6 years old exists. These will continue to deposit large quantities of seed into the field. Tree of Heaven is another major threat, particularly toward the south end of the field and near the house and is spreading in former firebreaks which had been disced. These were first treated in July/August of 2006 with Garlon4/Stalker basal stem application. Follow up will be required. A field adjacent to the house also has Tree of Heaven along its perimeter, and these were not treated in 2006 due to lack of time, chemical on hand.

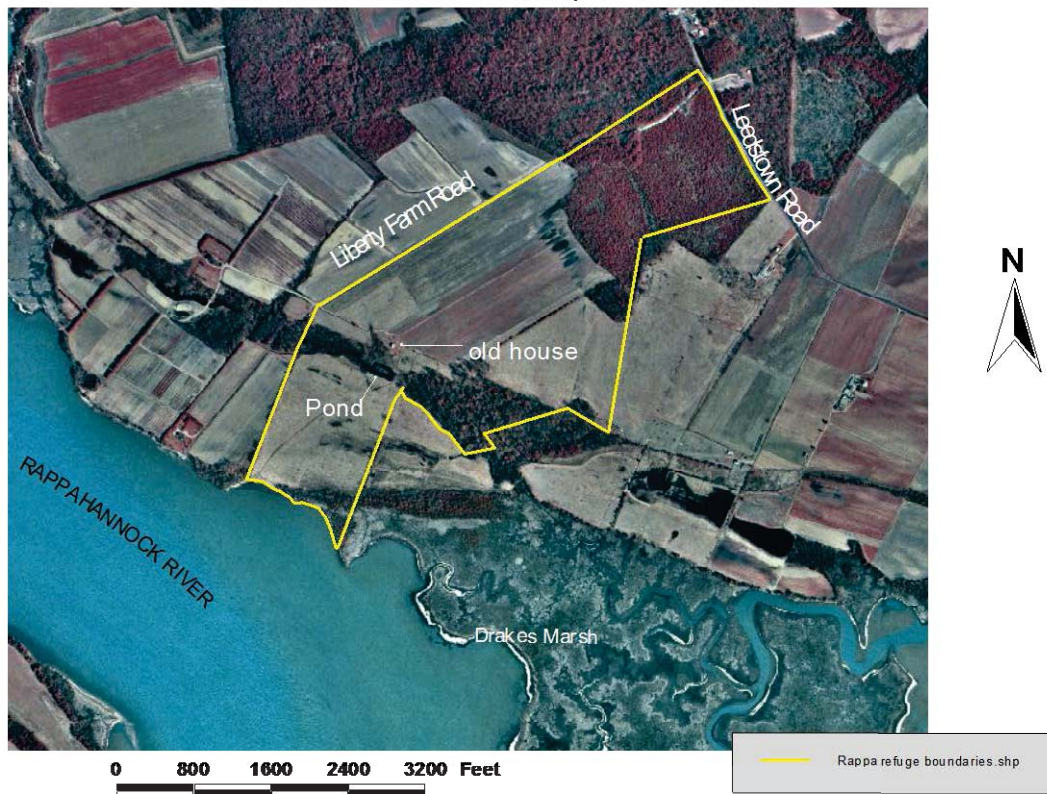
Needed Actions

- *Annually* mow firebreaks (10') to prevent trees from growing to a size which can create tire-puncturing stobs and to retard invasion into fields. Best time to mow to both kill trees & remove above ground biomass, yet not endanger nesting birds, is late August or September. However, firebreaks may need to be mowed again just prior to a scheduled burn for certain fields. See map.
- Continue to spot treat invasives with appropriate herbicides.
- Best action to prevent black locust from advancing into and overtaking the grassland/shrub field is to completely remove the trees, either by brushhogging or dozing down, then spraying the regrowth with appropriate herbicide. Very large source trees should be chainsawed down if of a

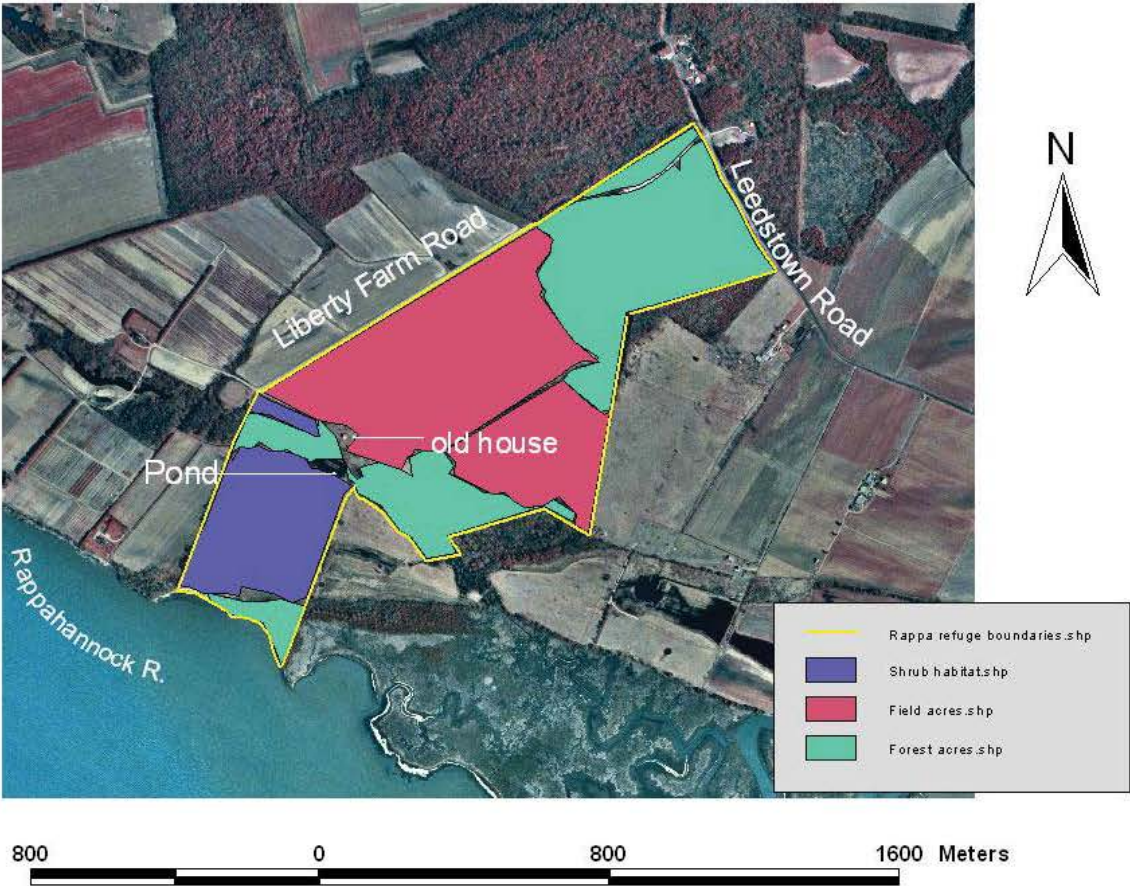
safe size to do so, or chemically girdled with a basal application of herbicide to kill them and thus prevent future seed depositions.

- Until the above action is carried out, the field edges will need to be annually or possibly bi-annually mowed to cut back the season's encroachment. Black locust and sweet gum grow very fast, can gain several feet in height in one season.
- Maintain grasslands through prescribed fire (winter, dormant season burns to remove biomass, return nutrients to soil) every 2 years; spot mow for trees and to create structural variety.
- Maintain an access route from end of Liberty Farm Rd to house and from house down to pond behind it. This will help facilitate treatment of invasives and maintain access to pond for water for prescribed burns. See map.

Rappahannock River Valley NWR Mothershead Tract, Overview



Mothershead Tract Vegetation Map



6. PETER

Brief Description

Acquired 12/22/03. 68.70 acres. Richmond County. Tract 10a/Peter Tract. Upper reaches of Mud Hole Swamp, mostly cutover pine, with some mixed hardwoods in steep ravines, potential public use site.

Habitat Management Goals & Purposes

Maintain as large block of mixed hardwood forest.

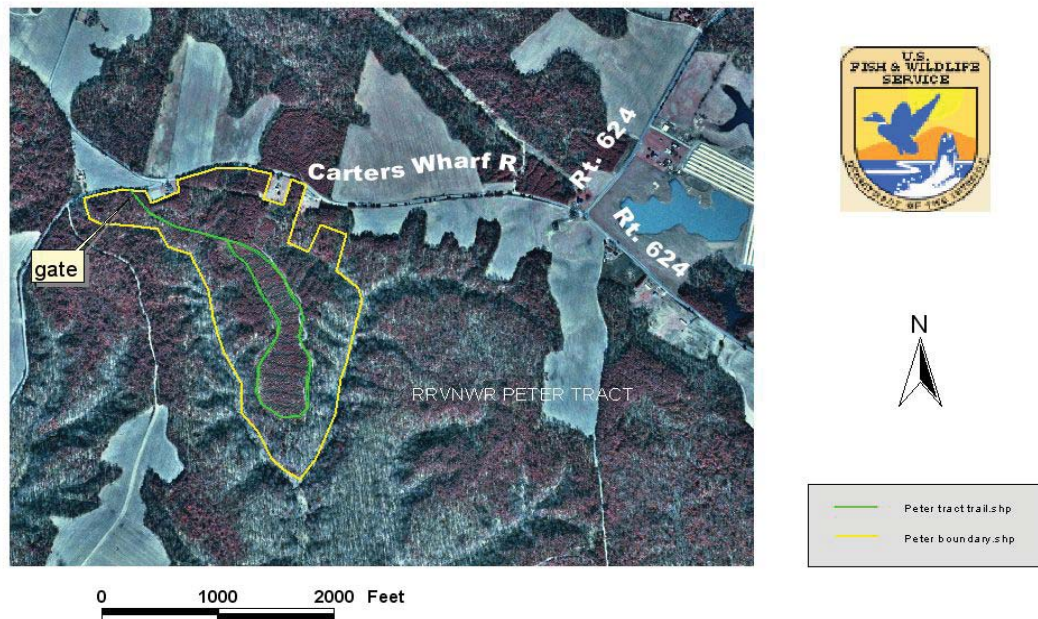
Habitat Management Issues of Concern

None known. Post boundaries.

Needed Actions

- Spot check for invasives and disease.
- Cutover area has grown up into a dense, almost monocultural stand of loblolly pine. Explore the possibility of thinning in the future to open up the canopy and allow more species and structural diversity.

RRVNWR Peter Tract



7. PORT ROYAL UNIT (LONG-BURNS TRACT)

Brief Description

Long Tract: Acquired 08/01/00. 97.53 acres. Caroline county. Tract 23/Long Tract, Cedar Creek frontage, invasive species control (Johnson grass initiated in 2003, Tree of Heaven, initiated 2006), planned for maintenance as grassland with existing forested buffer along Cedar Creek, Virginia Birding and Wildlife Trail #CFB6, deer hunting (archery) by permit.

Burns Tract: Acquired 05/11/01. 25.46 acres. Caroline County. Tract 24/Burns Tract, Riverfront, adjoins Long Tract, invasive species control (Johnson grass, autumn olive initiated in 2003; Tree of Heaven initiated in 2006), old fields reverting to shrubs and hardwoods, Virginia Birding and Wildlife Trail #CFB6, deer hunting (archery) by permit.

Habitat Management Goals & Purposes

Maintain the 50-acre field of the Long tract in early succession and the balance as large block riparian forest. Maintain the 25-acre Burns tract as forested riparian buffer.

Habitat Management Issues of Concern

INVASIVE SPECIES---Johnsongrass has been a persistent challenge, but has been substantially reduced. Needs a smother crop to prevent widespread recurrence and continued monitoring and spot treatment. The forest surrounding this field is heavily infested with Tree of Heaven...large crown canopy individuals and hundreds of seedlings. These were treated in August and September of 2006 (basal stem herbicidal spray with Garlon4 and Stalker). The Burns tract is also infested with Johnsongrass, Autumn olive, Japanese honeysuckle, and Tree of Heaven, occurring between and among desired tree species. However, because of the overgrown, shrubby, and dense matting of vines and briars, accessibility to treat invasives is exceedingly difficult and thus the invasives are grower taller, larger, or spreading.

Needed Actions

- Continue with volunteer efforts to spray Tree of Heaven in forest surrounding Long field.
- Annually mow Long field to keep invasion by Tree of Heaven in check until seed sources along edged can be neutralized.
- Spot spray for Johnsongrass in open field, prepare for interim ground cover or final ground cover of native early successional vegetation (grass dominant).
- *Annually* maintain a mowed firebreak around perimeter of Long and perimeter of Burns

- Open some access lanes into the interior of the Burns. Explore possible use of fire to reduce biomass between trees and facilitate access to invasives for treatment.

Long and Burns Tracts



0.2 0 0.2 0.4 Miles

8. Styer-Bishop

Brief Description

Styer tract (Tract 20), 41.44 acres, in King George County, was acquired on 11/24/98 41.44 King George. Former agricultural lands on Rappahannock riverfront, restored in native warm season grasses grassland and forest.

Bishop tract (Tract 21), 67.99 acres, also in King George and adjoins the Styer tract. Former agricultural lands on Rappahannock riverfront. Restored in native warm season grasses to provide grassland, some forest. Both tracts are long and narrow and are positioned perpendicularly to the river shoreline. Surrounded by crop fields on both sides.

Habitat Management Goals and Purposes

Maintain in early successional, riparian, and upland mesic mixed forest habitat.

Habitat Management Issues of Concern

INVASIVE SPECIES—this is the biggest habitat problem with the open fields of these two tracts. A five-acre patch on the north side of the entrance road is completely covered with kudzu, which has also draped the forest edge and jumped across the road and spread in the grasslands on the side of the road. Scattered occurrences of Tree of Heaven occur in this area too. Compounding the kudzu control issue is the fact that not all of it occurs on Refuge property. A concerted effort between Refuge and neighbors will be required to effect a long-term control of this problem.

Trees surrounding the grassland fields, particularly toward the river end are providing sources for woody encroachment and include heavy infestation of Tree of Heaven. These fields were burned in the winter of 2005 (dormant season), but woody portion of the fields was not reached until late in the day when sun was sinking. Higher humidity made it difficult to burn this section. A follow up burn was planned for 2006, but tight scheduling and other priorities of the fire crew prevented this from happening. A burn was attempted in March of 2007. but high winds due to an incoming front caused the fire to escape into a neighboring field. The burn was aborted and the woody area received no fire.

IMPROVE RIPARIAN BUFFER—The riparian zone along the river could be greatly improved for wildlife habitat and water quality functions were its forest cover widened substantially, up to

at least 300 feet. Since this end of the grassland is difficult to prevent woody encroachment due to the encircling nature of the tree line, it would make sense to allow trees to fill in here. There is high potential however for this approach to result in a monoculture stand of Tree of Heaven and black locust unless some intensive invasive management & prevention measures were conducted upfront.

Needed Actions

- Annually keep firebreaks around perimeters of these fields mowed to prevent stobs from forming in the breaks.
- Apply dormant season Rx burn to remove biomass of grasses and forbs.
- Before growing season underway (while regrowth of grasses still short), apply basal stem herbicide (Garlon4 + Stalker formula) to undesired tree species throughout the fields. (Bring John Deer Gator to facilitate access and transport of chemicals & back packs throughout fields, and/or 100 gal tank on a pick up truck.
- Assuming the trees are no more than 2" in diameter, follow up with bushhogging in late August, early September to further kill trees (late growing season treatment). Follow up with further spot treatment of herbicide in the next growing season.
- If these actions not carried out before the end of 2007, it may be too late to implement this plan the next year as these trees may be too large for bushhogging. If trees are too large for bushhogging, trees will either have to be dozed, or perhaps consider allowing this portion of the field to reforest.

**Rappahannock River Valley NWR
Styer-Bishop Tracts**



9. Tayloe

Brief Description

Tayloe Unit (Tracts 12, 12a, 12b, 12l, 12ll), 1,111.81 acres in Richmond County. Acquired on May 28, 1996. Has approximately 4.5 miles of frontage on Cat Point Creek. Habitats include tidal fresh marsh, wet meadow (some restoration), riparian buffers, native warm season grassland (restored and fallow), hardwood bottomland, pine forest, mixed hardwood forest, vernal pools, bald eagle concentrations and nesting sites. About 200 acres still under cooperative farming. Tract also designated as a Virginia Birding and Wildlife Trail site #NN19.

Habitat Management Goals and Purposes

Maintain as a diverse mix of forest and open grasslands. Cooperative farming to be gradually phased out. Depending on location of crop fields, some will be allowed to convert to forest, some will augment existing grasslands. Water control structure near east boundary of Field 10 serves to create a wet meadow on east side of farm road.

Habitat Management Issues of Concern

INVASIVE SPECIES --About 16 small (from 5-50 square meters) patches of *Phragmites australis* in the marsh have persisted and spread over the past 5 years. These have never been sprayed, although some patches on private land nearby were sprayed by helicopter in 2006.

Woody encroachment is occurring in the restored grasslands (Tayloe Field 4) on west side of farm road (mostly black locust). This field was formerly planted in switchgrass, big bluestem, and Indiangrass. The switchgrass quickly dominated and became extremely thick, dense, and rank, and possibly contributed to the decline in diversity of grassland species. Discing alone was not sufficient to thin the switchgrass, particularly after the field was burned, which stimulated regrowth of switchgrass and removed competitors. In spring of 2006, the 35 acres of the field was treated with glyphosate-based herbicide, followed by planting of clover to smother any switch grass that escaped herbicide. It is expected that over time, some grasses will reappear, and this is encouraged and welcomed. It is also hoped that the clover will help maintain some open patches until other forbs can become established, thus ensuring greater structural and species diversity in this field.

One patch of Japanese knotweed and *Phragmites* on left side of farm road just inside of gate. These had been sprayed in 2006.

F:/Habitat Management/Sort of a Habitat Management Plan (Sandy Spencer April 2011)

The ever pervasive Japanese honeysuckle takes over field edges wherever it can. It is likely that this will affect the fields recently planted in trees. Japanese stiltgrass can be found within the edges of the forest to the east of the farm road.

MOIST SOIL UNIT/WATER CONTROL STRUCTURE—the access to the water control structures on Tayloe becomes easily overgrown. It may not be important to maintain a path for a vehicle, as long as a person can walk to the structure for adjusting the boards. However, beaver activity in this area has been problematic in the past, so if bringing equipment to these sites will be needed to deal with this situation, then maintaining a lane for access ought to be evaluated. At the very least, all water control structures should be mapped on GIS and the coordinates filed on a hard copy document in the plat files.

Needed Actions

- Annually mow firebreaks around perimeters of Fields 4 and 5
- Monitor and invasive species and woody encroachment in Field 4 and 5. Brushhog this area to prevent further overtaking of the managed grassland.
- Monitor and treat invasives as they occur in the forest restoration fields (#14, 15, 16).
- Monitor for wetland invasives in the moist soil unit (fields #10, 24, 13).
- Maintain an access to the water control structure located at east end of field #11.
- Prevent switchgrass from dominating Field 4
- Spray Phrag patches in marsh!
- Every two years bushhog grass riparian buffers (some portions may need annual bushhogging to kill black locust)
- Periodically maintain an access route to the water control structure?

Insert overview of Tayloe here

10. Thomas

Brief Description

Thomas Unit (Tract 11a), 239.38 acres, in Essex County. Acquired on September 30, 1999. Has upland frontage on Piscataway Creek and tidal emergent marshland. Other habitats include cutover forest regenerating into hardwoods, about 35 acres of former agricultural land currently fallow and destined for hardwood restoration, ravines and seasonal streams.

Habitat Management Goals and Purposes

Habitat Management Issues and Concerns

INVASIVE SPECIES—is the biggest challenge for the 35 acres of open fields which immediately became dominated with Johnsongrass as soon as farming ceased. It has taken two years or more to get it under sufficient control before the next steps toward reforestation can be taken. The fields were last sprayed with a glyphosate based herbicide (2 qts/acre) in July 2006. These fields were burned for the first time since Refuge ownership in winter of 2006.

ADJACENT PRIVATE PROPERTY—Johnsongrass in the field adjacent to the 5-acre grassland has been allowed to flourish and provides a source of infestation.

GATE/ACCESS—Monitoring for invasives or biological resources would be greatly facilitated if the access road from Winston Street were improved, particularly where it joins the field. This area is frequently wet and undrivable.

UNAUTHORIZED ACCESS—four-wheelers from Cold Cheer, potentially enhancing the spread of invasives by transporting seed on tires.

Needed Actions

- Spot spray for Johnsongrass if needed in 2007
- Mow firebreaks
- Plant clover if Johnsongrass under control
- Plant trees as soon as funds/opportunity permits to benefit from the clover
- Post boundaries and fix gate lock
- Fix road (would Ball Lumber consider chipping in on this....they used our road to access the timber tract when clearcutting).
- Evaluate options for preventing access to refuge from Cold Cheer

- Craft a cooperative agreement with neighbor to manage Johnsongrass adjacent to refuge.
- Monitor entrance road for downed trees (adjacent woodlot was cleared, leaving line of weak trees unprotected)
- Monitor the repaired culvert between the two fields periodically.

Insert map/aerial photo of Thomas here

11. Toby's Point

Brief Description

Toby's Point unit (Tract 10), 365.47 acres, in King George County, was acquired on March 3, 1999. A peninsular, forested site with substantial frontage on Rappahannock River Riverfront. Forests consist of mixed upland hardwoods, regenerating loblolly pine (>25 years), laurel and rhododendron lined ravines, tidal swamp. There are also some shallow, tidal wetlands dominated by spatterdock. It is also the site of historic brickworks, hotel, and steamboat landing. The property adjoins a state-owned public boat ramp, known as Wilmot Landing.

Habitat Management Goals and Purposes

Maintain as forest habitat.

Habitat Management Issues and Concerns

INVASIVE SPECIES—Large stands (<2-3 acres) of Tree of Heaven have invaded the northwest portion of the forest in areas of logging and or powerline clearing and adjacent to a large patch of trees downed by windthrow. Most trees are young and sprouting from root system.

Large patches of Japanese honeysuckle and Japanese stiltgrass dominant the area around the abandoned house.

A relatively small stand of Phragmites has established and is spreading along the eastern-downriver edge of the forested swamp. The only way to get to this is by boat. Parts of the phrag stand extends back into the forest away from the river. While it is reachable now with a long hose and a pump, if allowed to continue to spread deeper into the swamp, it will result in an extremely difficult to control infestation.

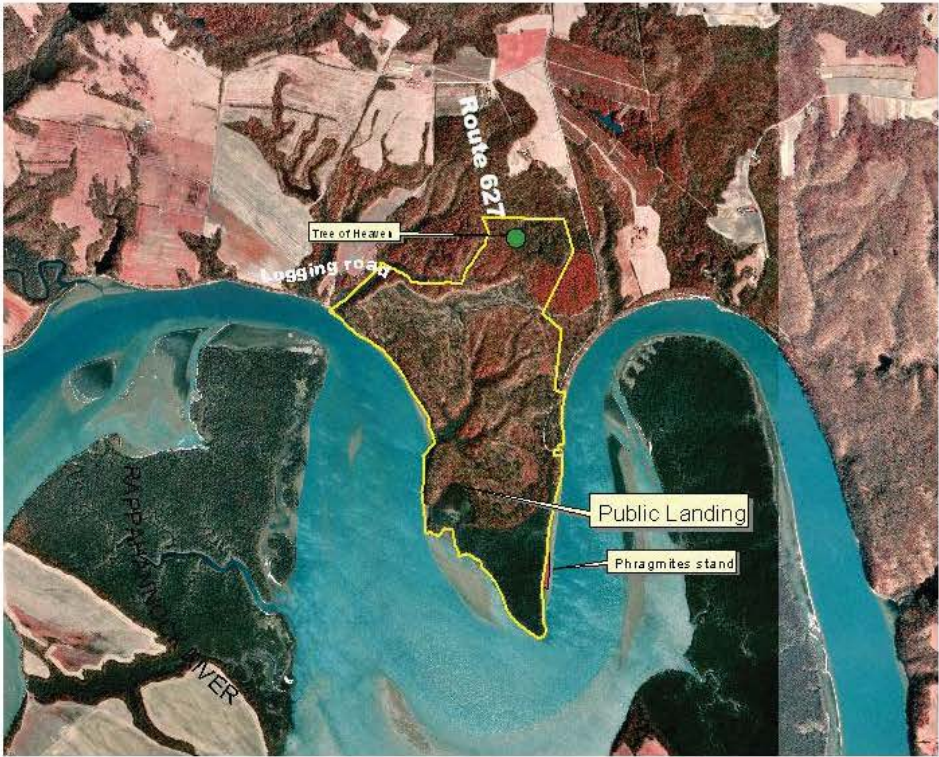
ACCESS—Currently difficult to access areas infested with invasives without crossing private property. The caretaker, acting for the landowner, however, has been very amenable and gracious about allowing access.

Needed Actions

- Basal stem spray the Tree of Heaven infestation with Garlon4-Stalker mix in backpacks. A team of 10 persons could likely knock this out in one trip the first year, followed by a smaller work party to clean up resprouts the 2nd year.

- Treating the stiltgrass and honeysuckle area could also be managed by a large work party outfitted with backpacks. Rate of spread not as rapid as the Tree of Heaven above, so would be 2nd priority for this tract.
- Spray the Phragmites patch developing along the downriver edge of the forested swamp (a few hundred yards from the public boat ramp).
- Explore possibility of acquiring the strip of land between the Refuge and the state road?

RRVNWR Toby's Point Tract



12. Wellford Fee

Brief Description

Wellford Fee unit (Tracts 37, I/C), 154.19 acres, Richmond County. Acquired October 9, 2003. Little Carter Creek and Route 360 frontage. Consists primarily of 50 acres former agricultural fields, the balance in cutover timber, CREP buffers, and riparian forest.

Habitat Management Goals and Purposes

Restore former crop fields to upland hardwood forest through native tree plantings and maintain unit as forest.

Habitat Management Issues and Concerns

INVASIVE SPECIES—Primarily *Phragmites australis* in the cutover area which occasionally floods from Little Carter Creek the likely source of the phrag.

Fields were prepared for tree planting with a well-established clover crop to inhibit competitors in 2005-2006. Trees planted in April 2007. Now that these fields will not longer be mowed, potential for incursion by invasives from the north side of the property is heightened. Protect/prevent invasives species such as Tree of Heaven, Johnsongrass, etc. from overtaking.

Needed Actions

- Monitor between the trees for invasives. Spotspray with backpacks.
- Spotspray using backpacks or marshmaster, or if feasible, helispray *Phragmites* in marshy forest just to north of 50 acre reforested field.

13. Wilna

Brief Description

Wilna unit (Tract 11), 974.40 acres, Richmond County, acquired April 1, 1999. Site of Refuge headquarters/office. One mile approximately of riverfront, extensive frontage on Wilna Creek (3-4 miles). Office located in 19th century farmhouse. Habitats include beaver wetlands, wet meadows, tidal marsh, forested riparian buffers, sandy beach, grasslands (restored in native warm season grasses and fallow), mixed hardwood forests, hardwood bottomlands, steep ravine systems, bald eagle concentration area (pine stand on river), pond. Wilna Pond is a public use site permitting fishing and non-motorized boating. Wilna is also a Virginia Birding and Wildlife Trail site #NN20.

Habitat Management Goals and Purposes

Maintain grassland habitat for priority grassland birds species, and large blocks of hardwood upland and bottomland forest, shrub and wetland habitats.

Habitat Management Issues and Concerns

RESTORATION OF FORESTED RIPARIAN BUFFERS—along riverfronts and creekfronts. This issue is related also to the invasives problems at the refuge. Fields F, G, H (the fingers), I, and J (see map) are designated for reforestation. Since coming out of agricultural production in 2000 or 2001, they were virtual clean slates upon which any colonizing species in the vicinity could become established. All had been planted in switchgrass. However, black locust is heavily invading the fingers and field I. Sweetgum is also invading the fingers. (See photos below). Some Tree of Heaven is populating these fields, but has been treated. The fingers and field I were burned in late February of 2007. This was a very hot fire which appears to have killed some of the younger trees, but live source trees still remain on the interior and along the edges. Sequestering the problem is not an option because the black locust is poised to invade the adjacent restored grassland, as it has done already in Field I.

MAINTENANCE OF LANDSCAPING AROUND WILNA OFFICE---It was decided during the CCP process that the fields adjacent to the Wilna office house should be kept open. Toward this end, they were restored from a fescue-dominated cover and planted in native grasses with the intention that this would make weekly mowing unnecessary. Field A immediately in front of

the office was also planted in wildflowers. All these fields should be bushhogged annually and kept free of invading trees such as black locust, Canada and bull thistle, lespedeza, multiflora rose, Japanese honeysuckle. Some undesirable native species should not be allowed to overtake, such as blackberry species, trumpet vine. Naturally occurring native species to promote include common milkweed, butterfly weed, solidago species.

REMOVAL OF FRAGMENTING STRUCTURES & TREES—The pivot irrigation structure standing between fields 13 and 14 had been there since before the tract was acquired by FWS. Trees grew around and in between flow lines and support struts and became too tall and big to brushhog. This fragmented the grasslands and created edge effects, compromising the habitat quality of these fields which represent a substantial investment of time and resources to restore. Also trees were growing along the border between the fields. Some were chain-sawed in 2006 for a chain saw class. The debris and trunks still remain. The debris impeded the ability to brushhog and maintain in early succession. In 2008 we contracted with Jackie Kelly to cut down and remove the irrigation pivot and all trees along the border between the fields. This reduced the edge-effect and unified the fields, but the area needs to be bushhogged annually to prevent trees from resprouting.

EROSION— The bald eagle roost at the Wilna riverfront has been eroding at approximately 1-2 feet per year. The root systems of the large pines closest to the river are exposed and a few to several trees fall into the river each year. The roost site will be lost within 15 years at this rate. There are few roost sites within the Rappahannock bald eagle concentration area that resemble this one—a 10-acre stand of mature canopy loblollies right on the river shore. Erosion is also occurring on the shorelines upriver from the roost area, but the banks are considerably higher, affords more resistance. Nevertheless there is calving and slumping and some trees, particularly an old willow oak, which has recently died from loss of soil around its roots and fallen.

INVASIVE SPECIES—Most of the invasive problems occur in edge habitats, or in early successional habitats. Species with extremely high potential for spread and stand-replacement are black locust, Japanese honeysuckle, lespedeza, Tree of Heaven (if in an open field), thistle, Johnsongrass, Japanese knotweed, and kudzu. Other species that have a slower rate of spread but the potential to cause stand replacement by suppressing recruitment

F:/Habitat Management/Sort of a Habitat Management Plan (Sandy Spencer April 2011)

of native species are Japanese stiltgrass, pawlonia, multiflora rose, English ivy, and Phragmites.

- Canada and bull thistle are invading the planted grasslands (Fields 14, 15), and less so in Field 6/7, 1-4. It does not seem to be present in Fields 13 and the tallgrass portion of 8. Possibly because these fields are so dense with tall grass that it could not establish.
- Japanese stiltgrass infests the forest edges around the office complex.
- Tree of heaven was mostly concentrated in the woods around the office complex, and along the edges of fields 1-4, 6 & 7, 8, 12, the riverfront fields, and the fingers bordering field 8. Most of the tree of heaven has been eradicated but occasionally a few will show up each year.
- Black locust heavily concentrated in the fingers bordering field 8, Wilna I, in the tree border along the north edge of fields 14, 15, and 16, along the public use trail along Wilna pond (Field 3), along the north edge of fields 6-7, and spreading through the fields surrounding the office complex, especially B. Restored grasslands are threatened by invasion by this high seed-producing, windborn species especially along field edges upwind of prevailing winds. Fields most affected are Wilna 8 (from the fingers F, G, H), Fields #14, #15 (from northwest tree line), Field #3 (from trees along pond). Black locust in Wilna I has been largely eradicated by physically mulching down the 2 acre stand in the field followed by spraying the regrowth, and repeatedly spraying the parent trees in the edges.
- Johnsongrass mostly infests fields 1-4, 6 & 7 and is now mostly under control.
- Japanese honeysuckle is everywhere along field and woods edges and also exists in patches in the interior of fields 1-4, and is thoroughly draping the narrow strip of woods along the pond.
- Lespedeza is the dominant ground cover of the southern half of field 17, and infests edges and interior portions of fields 1-4, 12, 14, and 15.
- Multiflora rose around the office complex has mostly been eradicated.
- Japanese knotweed was growing on the riverfront side of Field I. Another patch first detected along the main visitor entrance road. Both these areas were treated in 2006. Another patch exists just off refuge property on the northeast border of Field 20.
- Chinese privet is overtaking an area in the woods on the northern edge of Field 1, around the ruins of an old farmhouse.

- Phragmites—a persistent patch of about 2 acres is in Wilna Creek. This was aerially sprayed in 2009? with seemingly good kill, but about half of it was missed. A recent appearance at Frog Holler, the moist soil unit between fields 12 and 13, was first reported in 2005, the bald eagle roost area (first noticed and reported in 2006). The Frog Holler patch was sprayed in October or November 2007.

A more detailed map of the location of the known invasives on Wilna is attached.

GRASSLAND MAINTENANCE—as long as providing grassland habitat remains a goal of this refuge, this will always be an intensive effort that will require attention annually and at varying times throughout the year. Firebreaks will need to be mowed annually to keep trees from establishing. If allowed to grow more than one year, brushhogging leaves stobs which could puncture the tires of fire trucks or light duty equipment. Keeping the perimeters of the grasslands free high seed-producing trees, particularly if upwind of the field in the direction of the prevailing winds, will also be an annual effort and likely will not be accomplished in one year unless a massive staff, volunteer effort, or paid contractor to the job were deployed.

MOIST SOIL UNIT MAINTENANCE—Shallow ponds which support high volumes of aquatic vegetation will over time become too acidic and lose their potential to support the vegetation favored by waterfowl. Every 4 years they should be drained and disced, according to some impoundment management resources. However, the sheet waterflow at Wilna are often is not sufficient to permit much management at all. The tendency is for these moist soil units to dry out annually. This is actually highly beneficial from the standpoint of amphibian breeding, as it removes predatory fish. Also, with discing there is risk of increasing invasion by exotic species. All the waterboards have been kept in place in order to hold as much water as possible. The access to the three water control structures on Wilna tend to become overgrown. While it might not be necessary to maintain an avenue to accommodate a vehicle, as least one wide enough for a person to walk or drive a Gator. The locations should be mapped with GPS and stored on the public harddrive.

14. Wright

Brief Description

Acquired 10/27/99 845.35 acres in Richmond County. Tract 11b/Wright Tract, adjoins the Wilna Tract. The upland, more level acres consists of cutover forest burned and seeded in loblolly pine prior to refuge acquisition, proposed for thinning and maintenance as mixed pine and hardwood forest. The steep slopes and ravines are mixed hardwood of beech, oak, tulip poplar and mid story heath communities. Narrow ravines give way to broader bottoms with beaver ponds, beaver meadows, and braided streams with scattered hardwood and snag overstory.

Habitat Management Goals and Purposes

Manage as mixed pine and hardwood forest. Whip-poor-will and chuck will's widow have been discovered in the pine community to the east of the main road, in the vicinity of the first lateral logging road. This tract has two active bald eagle nests, and the only site in the Rappahannock NWR where Kentucky warbler has been repeatedly recorded.

Habitat Management Issues

Large portions of the cutover area consists of very dense loblolly or tulip poplar monocultures. Large patches of Japanese stiltgrass blanket formerly logged and disturbed areas. This will prevent recruitment of the native tree species. This grass is avoided by deer.

Needed Actions

- Recommend thinning the dense pine stands to open up the canopy, permit light to the forest floor, and encourage recruitment of native hardwood species such as oaks. Conduct a series of light prescribed burns to promote oak communities with a diverse mid-story.
- Maintain logging roads periodically.
- Continue to spot check for invasive tree species such as tree of heaven, phragmites (in the beaver creek on north side of refuge).
- A work crew with back packs is needed to spray the Japanese stiltgrass. This invasive species requires repeated attacks over a few years to remove, as the seeds remain viable up to 7 years.

15. Wellford Easement

Brief Description

04/05/05 847.8 acres in Richmond County. Tract 42C, -I, -II, -III/Carroll Wellford Easement II/Connects Phase I easement with Thomas Tract and Little Carter Creek.

Habitat Management Goals and Purposes

Maintain as agricultural

Habitat Management Issues

Adequate buffers between crop fields and wetlands, drainages.

Needed Actions

16. Menokin Easement

Brief Description

In Richmond County with one mile of frontage on Cat Point Creek, acquired 08/26/05, about 325.8 acres which includes some emergent marsh (14 acres?). Identifier: 40C, -I, R.

Important riparian habitat. No commercial timbering permitted (only salvage or forest health harvests). In prime bald eagle concentration area. Ancestral home of Francis Lightfoot Lee and Laura Tayloe.

Habitat Management Goals and Purposes

Manage as **mesic mixed hardwood** forest and riparian forest.

Habitat Management Issues

INVASIVE SPECIES—Around perimeter of field/forest edge. While the majority of the open space (not included in the USFWS easement) is in agriculture, invasives in this area is mostly confined to edges. Around the old home site and to about 100 feet into the forest in an infestation of English ivy, which is threatening the large canopy trees.

Needed Actions

- Update the current forest management plan written by the VDOF to fit Refuge wildlife & habitat management goals for this easement (ie quality breeding habitat for forest interior birds)
- Instruct staff on safety and use of herbicides
- Help staff develop a body of volunteers to assist with invasives management; include Menokin in Refuge invasives efforts as resources permit.
- Kill the ivy growing up all the trees, apply appropriate herbicidal treatment to ivy covering the ground
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