

Restoration Planning and Implementation - Lusk Creek Illinois Audubon Sanctuary

Wildlife Preservation Fund Grant #11-012W

Project Final Report

Submitted by:

Tom Clay, Executive Director
Illinois Audubon Society

Submitted to:

Illinois Department of Natural Resources
Office of Resource Conservation
One Natural Resources Way
Springfield, Illinois 62702-1271

January 19, 2012

Final Report
Wildlife Preservation Fund Grant #11-012W

Project Title

Restoration Planning and Implementation – Lusk Creek Illinois Audubon Sanctuary

Grantee

Tom Clay, Executive Director
Illinois Audubon Society
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Timeframe of Project

November 24, 2010 through December 31, 2011

Project Objective

The mission of the Illinois Audubon Society is to promote the perpetuation and appreciation of native plants and animals and the habitats that support them. Wilderness is to be “protected and managed as to preserve its natural conditions...” (The Wilderness Act of 1964, Sec 2(c)).

1. Development of a site management plan consistent with the mission of the Illinois Audubon Society and the Wilderness Act (future wilderness designation is likely) is intended to provide guidance toward the following goals and objectives:

- Provide primitive recreational opportunities such as hiking, bird and wildlife watching, enjoyment of scenery, wildflowers, geology and opportunity for solitude
- Promote and steward ecological integrity of the land and health of Lusk Creek INAI
- Promote and steward native resident fish and wildlife populations
- Maintain remote character of the area
- Promote and restore wilderness character by eliminating the noticeable imprints of man’s work and by restoring native plant communities

2. Implementation of priority action items identified in the site action plan will provide the actions vital to restoring and protecting native plant and animal communities as well as restoring and enhancing the wilderness character of the site. Management objectives are likely to include controlling or eliminating certain non-native invasive species, restoring old fields to native hardwoods, obliterating and re-vegetating old roads, giant cane restoration, and conduct some site clean-up. However, Illinois Audubon will seek qualified contractor to develop a plan that provides the Society with specific management direction.

Project Summary

The Illinois Audubon Society purchased a 57 acre inholding surrounded by the 6,800 acre Lusk Creek Wilderness area of the Shawnee National Forest, northeast of Eddyville in Pope County. IAS acquired the land to protect its varied natural features, including the upper reaches of Lusk Creek INAI site flowing through the parcel. While the overall natural quality of the IAS parcel is high, it does contain localized impacts from human use including several infestations of non-native invasive plant species.

The project concentrated on the development of a management plan and management actions consistent with the IAS mission while taking the Wilderness Act of 1964 into consideration for wilderness users and possible future wilderness designation of the parcel. The desired management actions should protect the existing natural features and restore wilderness character to the land where the imprint of man's work is obvious.

The project started with a survey and inventory of the site to identify and evaluate management concerns. Literature reviews of recent studies conducted on the site were undertaken and concerns, threats, and priorities were discussed in developing the plan. The plan was drafted, edited, and finalized with Illinois Audubon Society staff and board member input.

Several management plan priority action items were implemented with this project as well. Non native invasive plant species control was undertaken with the primary autumn olive treatments in the old field sites completed. Bush honeysuckle control treatments along the road and refuse/debris cleanup efforts were also undertaken. A hand-held sprayer and 2 gallons of Crossroads herbicide were provided to IAS volunteers by the contractor. Discussions with U.S. Forest Service staff regarding gating and closing the public road into the Wilderness area took place. Requests for Forest Service assistance in removing some debris from the site were also made.

Reimbursement Requested: \$2,000.00

Project Objectives Met

The IAS contractor (Christopher Evans) developed a comprehensive site management plan (see attached) with goals and objectives consistent with the Illinois Audubon Society mission and wilderness values. The plan contains descriptions of the natural resources found on the site and an analysis of the present conditions, with specific management concerns for different portions of the property. It also makes management recommendations, prioritizes the recommendations and sets a timeline for their implementation.

With the help of a volunteer, the contractor implemented the first priority action item/recommendation of primary autumn olive control treatments, including equipment maintenance and supplies. To facilitate the ongoing volunteer efforts of non native invasive species control at the site, the contractor provided volunteers with a pump sprayer and herbicide.

Volunteers have addressed the bush honeysuckle infestation along the road on Shawnee National Forest land to prevent future invasion on to the IAS site and have begun the debris cleanup efforts at the site. An additional visit by volunteers to monitor the parcel for horse and off road vehicle use took place in late November. A volunteer also assembled literature, maps and photos of the site for use in establishing the plan and met with the contractor on several occasions to inventory the site and to discuss the plan and management issues. Volunteer time was spent talking to Forest Service officials regarding gating the road at the Wilderness boundary and a request was made to enlist the agency's help in debris removal. A total of 47 volunteer hours were spent.

Future implementation of the plan is ongoing and scheduled, including the first of 2 volunteer cleanup days in 2012, the first which is tentatively scheduled for March 3 or March 31st. The first date is subject to change depending on weather and soil moisture conditions. A visit to the site in late spring is planned for invasive species control as well (predominately for autumn olive & bush honeysuckle control). More research on best practices for direct seeding the open fields will be conducted. Another visit is expected by the Cooperative Weed Management Strike Team to treat Chinese yam and evaluate Japanese stilt grass infestations. These planned volunteer activities are in line with the management plan's priority recommendations and timeline.

Detailed Budget

	<u>Project Total</u>	<u>WPF Funds Requested</u>	<u>Cost Share</u>
Personnel (volunteer hours)			
5 hrs. to assemble information for plan	\$ 100.00		
40 hrs to implement action items in plan	800.00		
			<u>\$900.00</u>
<hr/>			
Contractual Services			
Development of Mgmt. Plan	750.00		
Implementation of priority action items	1,250.00		
		<u>\$2,000.00</u>	
<hr/>			
Detail Total Cost of Project	<u>\$2,900.00</u>	<u>\$2,000.00</u>	<u>\$900.00</u>

Actual Budget

	<u>Project Total</u>	<u>WPF Funds Requested</u>	<u>Cost Share</u>
Personnel (volunteer hours)			
5 hrs. to assemble information for plan	\$ 100.00		
42 hrs to implement action items in plan	840.00		
			<u>\$940.00</u>
<hr/>			
Contractual Services			
Development of Mgmt. Plan	864.00		
Implementation of priority action items	1,136.00		
		<u>\$2,000.00</u>	
<hr/>			
Detail Actual Total Cost of Project	<u>\$2,940.00</u>	<u>\$2,000.00</u>	<u>\$940.00</u>

ILLINOIS DEPARTMENT OF NATURAL RESOURCES
FY11 WILDLIFE PRESERVATION FUND GRANT PROGRAM

PAYMENT REQUEST CERTIFICATION

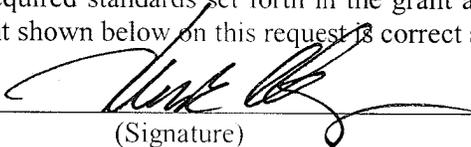
Grantee Information

Grantee Name: Illinois Audubon Society
P.O. Box 2547
Springfield, IL 62708

Grant Agreement #: 11-012W

Amount of
Reimbursement Requested: \$ 2,000

I certify that the goods or services specified on this request for payment were for the use of this agency and that the expenditure for such goods or services was authorized and lawfully incurred, that such goods or services meet all the required standards set forth in the grant agreement to which this request for payment relates, and that the amount shown below on this request is correct and approved for payment.

By:  Date: 11/20/2012
(Signature)

Name: Tom Clay Title: Executive Director

Grantee F.E.I.N. / TIN: 36-6065870

Attach copies of vendor billings, proof of payment, and other necessary documentation and send the Request for Payment Certification to:

Bob Lindsay
Illinois Department of Natural Resources
P.O. Box 67
Goreville, IL 62939
Telephone #: (618)995-2568
E-Mail Address: Bob.Lindsay@Illinois.gov

For DNR Use Only

Approved
for Payment: _____
Signature

Name: _____

Date: _____

Explanation of Expenses

Chris Evans, Lusk Creek Management Plan Project

March 15, 2011 – December 31, 2011

Work Rate - \$32/hour

Management Plan Development

27 hours

\$864

Inventory, Survey and Mapping

10 hours

\$320

Completion of Primary Autumn Olive Control Treatments

16 hours

\$512

Equipment Preparation and Maintenance

2 hours

\$64

Expenses Related to Equipment Upkeep and Operation (Gasoline, bar-oil, herbicide, etc.)

\$20

Misc Activities Related to Project (Correspondance, Literature Review, Etc.)

2 hours

\$64

Equipment Purchases

One handheld, pump sprayer, and two gallons of Crossroads herbicide

\$119.32

Miles Driven on Personal Vehicle for Project (Federal Mileage³ Reimbursement Rate = \$0.55 /mile)

82 miles

\$45.10

Total Expenses Related to Project = \$2,008.42

Reimbursable Amount = \$2,000.00

INVOICE

Chris Evans, 2114 Market Road, Marion IL, 62959 · rivertoriver@gmail.com · 618-364-7261

December 27, 2011

To: Illinois Audubon Society
PO Box 2547, Springfield, IL, 62708

RE: Invoice #2011-1 - Invoice for services related to Wildlife Preservation Fund – Lusk Creek Management Plan Project

Dear Illinois Audubon Society,

This invoice is requesting payment in full of \$2000.00 for successful completion of the contract to write and partially implement the Lusk Creek Property Management Plan. I've already submitted the final management plan and also see the enclosed work log for details on project activities.

Please make payment to Chris Evans, 2114 Market Road, Marion, IL 62959.

PAYMENT REQUESTED - \$2000.00

**A MANAGEMENT PLAN FOR ILLINOIS AUDUBON SOCIETY'S
LUSK CREEK PROPERTY, POPE COUNTY ILLINOIS
2012 - 2016**

Report to the Illinois Audubon Society

Submitted December 23, 2011

by Chris Evans

Table of Contents

Introduction.....	1
Statement of Management Goals and Objectives.....	2
Site Description	2
Summary Analysis of Current Situation.....	7
Summary of Major Management Concerns.....	8
Detailed Analysis of Management Recommendations	10
Upland Old Field	10
Regeneration/Management of all Old Fields	11
Removal of Junk and Debris from Property.....	12
Management of Glade Community	13
Management and Regeneration of Cane Stands	14
Invasive Species Management.....	15
Additional Management Recommendations.....	19
Timeline and Priority Recommendations for Plan Implementation	21
Plan Summary	23
Figures	24
Appendix A: Plants Listed by Group, Then Family	26
Appendix B: Invasive Species Identification and Management Information	32
Appendix C: Resources for Management	42

INTRODUCTION

This management plan for the Illinois Audubon's Lusk Creek Property was written for the Illinois Audubon Society using funds from the Illinois Wildlife Preservation Fund Program.

This plan gives detailed information about the current state of the property, an analysis of future conditions, a statement of the goals and objectives of the management efforts, and details the steps necessary to meet those goals and objectives. This small parcel of land is incredibly diverse, both in species numbers and habitat types. Everything from riparian habitats to dry glades can be found here, along with over 500 species of plants. Even with this diversity, there are issues that need to be addressed through management. Being surrounded by Wilderness, this property provides a great opportunity to join in on this goal of large blocks of untrammeled lands. For this to happen though, much work is needed to remove the signs and remnants left over from previous uses. Similarly, invasive species are present on the site, some already having significant impacts. To truly protect the abundant resources present, work is needed to eradicate, control, or contain these invaders.

This plan addresses these and other issues related to management of the Lusk Creek Property.

As time progresses, situations and priorities change, and management practices are implemented, the applicability of a particular management plan diminishes. Because of this, I recommend revisiting and updating this plan in 5 years. Likely much of the actions recommended in this plan will be implemented by that time anyway. It should be the goal of the Illinois Audubon Society to work towards a hands-off (or at least minimal) approach to management of this site. The remoteness, difficulty of access, and high-quality nature of much of the property lend itself towards this goal, but it will require work to bring it to that state. In addition, several aspects of management will require continual input; in particular, invasive species management. While I envision the workload involved in invasive species management to diminish overtime, some level of work will always be necessary to implement effective Early Detection and Rapid Response principles to find and eradicate any new invasive species threats that find their way onto this parcel of land. Of course, this will likely require only a minimal input over time and mostly involve surveying the site (and who doesn't like a nice walk in the woods from time to time anyway!).

Care was taken in the writing of the document not to recommend unnecessary or frivolous activities, so as to not waste limited resources available for management. My goal as author of this document was to create a useful, realistic plan that will be used and provide guidance for the best management of this unique and fascinating parcel of land.

Sincerely,



Chris Evans
Biologist and Management Plan Author

STATEMENT OF MANAGEMENT GOALS AND OBJECTIVES

The overarching goals for the site are the protection and restoration of the wilderness characteristics at the site and the protection and restoration of the natural communities and resources of the property.

The specific goals of this management plan are to work towards meeting the site goals through recommending actions to restore/maintain as much of the natural ecosystem and community properties as possible, protect the rare plants and habitat types, maintain the high level of biodiversity present on the site, and to capture the 'wilderness' character of the site by removing the remnants of human habitation that occur on the site.

Specifically, the objectives recommended to meet these goals are to:

- 1. Eradicate, control, or contain existing populations of invasive species and prevent new infestations on site***
- 2. Protect and possibly enhance existing rare habitats including cane thickets, glades, and bluffline habitats.***
- 3. Removal of junk, debris, and other remnants of human habitation including the cabin site, junk pile at the entrance, the trailer and debris down by the creek, the tree stands, and the culvert and chain link across the creek***
- 4. Eventual closure of the road leading into the property***

SITE DESCRIPTION

Legal Description and History

In April of 2007, The Illinois Audubon Society purchased a 57 acre private inholding surrounded by the 6,800 acre Lusk Creek Wilderness area of the Shawnee National Forest. The parcel is located northeast of Eddyville, east of Illinois Route 145 (NW1/4 Sec 27, T11S, R6 E, Eddyville Quadrangle). The parcel was purchased by the Illinois Audubon Society because of the natural features found on the site including a segment of Lusk Creek which is an Illinois Natural Area Inventory (INAI) site.

In addition, this was a key acquisition for Illinois because it was one of the last remaining private property parcels on Lusk Creek within the Wilderness Boundary. Lusk Creek INAI flows through the tract which is also bordered on the southeast by Lusk Creek Canyon National Natural Landmark.

Previous to being purchased by the Illinois Audubon Society, the property was used mainly for outdoor recreation (hiking and hunting). As is the case with most of southern Illinois properties, portions of the site were likely farmed in the past and the timber resources logged.

The entire Lusk Creek area has a history of recreational use, particularly horseback riding. The site shows evidence of horseback riding, though steps have been taken to reduce that use. ATV use also occurs throughout the region and undoubtedly on the site as well. While Lusk Creek is still relatively small when it passes through the property, canoeists and kayakers have been known to paddle this section in high water times.

Ecological Description

Ecologically, the site lies within the Shawnee Hills physiographic section of the Interior Low Plateau Ecoregion. This physiographic section is known for its high species diversity. The region was recognized as a conservation priority through being designated a Conservation Opportunity Area in the Illinois Wildlife Action Plan.

The site consists of a diversity of habitats including a complex of sandstone glades and dry upland forests, mesic forests, sandstone cliffs and talus slopes, perennial stream and adjacent gravel bar, an upland old field, and several bottomland old fields. While the overall natural quality of the site is high, it does have some localized impacts from nonnative invasive species, previous land use, and roadway erosion. The site also contains remnants of a cabin and a relatively small dump site.

Plant diversity is extremely high for this small of a parcel of land. In 2010, Jack White surveyed and compiled a list of 574 species of plants (flowering plants and ferns and fern allies) that included 509 native species, six state-listed threatened or endangered species and eight species listed as sensitive by the US Forest Service. As part of this effort, nine highly invasive species were also recorded: Chinese yam (*Dioscorea oppositifolia*), Japanese stiltgrass (*Microstegium vimineum*), tall fescue (*Festuca arundinacea*), johnsongrass (*Sorghum halepense*), Japanese honeysuckle (*Lonicera japonica*), autumn olive (*Elaeagnus umbellata*), Sericea lespedeza (*Lespedeza cuneata*), sweet clover (*Melilotus albus*), and multiflora rose (*Rosa multiflora*) (see Appendix A for a full species list). In addition, as part of the survey effort involved in writing this management plan, bush honeysuckle (*Lonicera maackii*) was located adjacent to the parcel on Forest Service land.

The 57 acre parcel can be split into nine generic habitat types (see Figure 1, page 24) including bluffline, cane thicket, creek bed, sandstone glade, gravel/sand bar, mesic forest, upland forest, old field, young regeneration site. Two additional habitat types, both relating to human use, were mapped; road and cabin site.

Hardwood Forests

The parcel is dominated by hardwood forests ranging from dry upland to mesic floodplain. These sites are, for the most part, typical second growth mature forests dominated by oak (*Quercus* sp.) and hickories (*Carya* sp.) with sugar maples (*Acer saccharum*), tuliptrees (*Liriodendron tulipifera*), elms (*Ulmus* sp.), etc. also present. Typical midstory species include spicebush (*Lindera benzoin*), dogwoods (*Cornus florida*), and redbud (*Cercis canadensis*). Soil moisture, topography, slope, and soil types vary greatly throughout the forests and exposed sandstone bedrock is common on the

slope and upland portions. The bottomland sites vary from gravely to silty soils and portions can be frequently inundated in flood events.

Old Fields

Old fields, both upland and bottomland, is the next most abundant habitat type. Before the Illinois Audubon Society purchased the land, these fields were bushhogged or hayed periodically. They are dominated primarily by exotic cool season grasses (*Festuca arundinacea* and others) but do display a surprising amount of diversity of both native and non-native species (White 2010), particularly the upland field.

Since the cessation of mowing and haying when the parcel was purchased in 2007, woody seedlings have moved into the fields aggressively. Light seeded species, such as ash (*Fraxinus* sp.) and elm can easily be found along with sassafras (*Sassafras albidum*), sumac (*Rhus* sp.), sycamore (*Platanus occidentalis*) and the occasional oak and walnut (*Juglans nigra*) seedling among others. In addition, the upland field and the bottomland field adjacent to the cabin site both have autumn olive infestations. The upland site is moderate to heavily invaded while the bottomland site is lightly invaded. Mature plants capable of producing fruit were found in both fields.

The bottomland field to the west of the cabin site is dominated by blackberry brambles (*Rubus* sp.) and has a declining population of johnsongrass. In addition, the giant river cane (*Arundinaria gigantea*) that borders this field appears to be colonizing the edges of the field somewhat (as is the Chinese yam to a lesser degree).

Sandstone Glade

This parcel of property houses two high quality sandstone glades, one on each side of the creek. The glades occur on the landscape just uphill of the blufflines, as the bedrock that makes the bluffs is exposed. The westernmost glade is larger if considering only the portions on Audubon property. The easternmost glade continues onto the adjacent Forest Service property. These glades are characterized by shallow to no soil, exposed bedrock, poor growing conditions, stunted trees, and a unique community of plants. The glades on the property house unique plants, such as the blackfoot quillwort (*Isoetes melanopoda*) and dwarf hackberry (*Celtis tenuifolia*).

The edges of the glades are somewhat dominated by mesic hardwood trees and eastern red cedar (*Juniperus virginiana*), but they do not appear to be invading the actual glades to any degree. Japanese honeysuckle also is common in the glades, particularly along the bluff edge. In addition, the road to the cabin site bisects the westernmost glade.

Cane Thicket

A habitat feature once common in southern Illinois was expansive thickets of giant river cane along streams. These cane breaks, or thickets, occur usually in flat bottomlands, but can also be found on side slopes and, to a lesser degree, upland sites. Cane occurs on the property along Lusk Creek.

These thickets range from very dense, near monocultures, to sparse and interspersed with other vegetation.

Cane thickets are a unique habitat that is utilized heavily by wildlife. Rare species, such as the Swainson's warbler (*Limnothlypis swainsonii*), are somewhat cane specialists and migrating birds, such as the woodcock (*Scolopax minor*), often preferentially choose river cane thickets as migration stopovers.

Giant river cane is a monocarpic perennial, meaning that the plants (most stands are clonal and technically a single or few actual individuals) can live for years without flowering. When they do flower, the plant dies and the stand regenerates from seed or any non-flowering individuals. A large portion of the cane thicket at the property appeared to flower and dieback in 2010. This can look alarming to those not familiar with the species, but is a natural part of its ecology.

Chinese yam and Japanese stiltgrass both occur within the cane thickets. Most is lightly invaded, but portions are heavily invaded with both species. While neither invasive is likely a direct threat to the cane itself, both can impact the overall community and may make the stands less desirable for wildlife species.

Bluffline and Talus Slopes

Another hotspot of diversity and conservation target is bluffline and talus slope communities. These habitats are home to a unique assemblages of species, including many rare ones. The combination of rock outcroppings and deep shade provide unique conditions for plant to grow in. These bluffline and talus slope habitats have extremely wet and dry conditions in close juxtaposition.

The blufflines and talus slopes that occur primarily in the western border of the property hold an impressive population of the state-listed French's shooting star (*Dodecatheon frenchii*). In addition, the site has been home to a black vulture (*Coragyps atratus*) nest for at least the last several years. These are very high quality sites with little threats currently identified.

The talus slope on the property transitions into mesic forests as you progress away from the bluffline. These two habitats share many of the same species. Horse traffic along the lower end of the talus slope and along the creek was historically heavy but has diminished lately. There is still evidence of horse use and some existing trails, but they do not appear to be frequently used. In addition, Japanese stiltgrass occurs along the lower portions of the talus slope, likely brought in by horse traffic and flood conditions.

Gravel/Sand Bar

A small portion of the property is in a gravel/sand bar along the creek. This occurs on the inside of the big bend in the creek in the southern portions of the property. As the stream pushes water through the winter, it is gradually eroding the outside and depositing material on the inside bend.

Flood events continually scour this portion of the property, adding new material and setting back succession. This site is dominated by fast growing, quick spreading ruderal species.

While this habitat occupies only a small portion of the land area of the site, it is unique and important part of any small stream ecosystem. Unfortunately Japanese stiltgrass has heavily invaded this habitat and now dominates all but the wettest, most frequently flooded sections. Chinese yam has also invaded, but cannot withstand the scouring as well as stiltgrass.

Young Regeneration Stands

With time and lack of disturbance, old fields succeed into young regeneration stands and eventually into forests. This is a transitional and temporary habitat that cannot be maintained on the landscape over time without significant inputs.

A small portion of this habitat occurs in in the NE portion of the property as well as a tiny portion along the stream in the SW portion of the property. These sites are dominated by young saplings of black walnut, sycamore, and box elder (*Acer negundo*). While these two portions will quickly transition into mesic forests, this habitat type is actually expected to expand on the property as the old fields continue to succeed and transition into young regeneration sites in the next 10-20 years.

Creek Bed

Lusk Creek is an Illinois Natural Area Inventory site, listed as one of the best examples of a small stream system in Illinois. Portions of the creek are also a National Natural Landmark and an Illinois Nature Preserve.

Lusk Creek is home to the rare least brook lamprey (*Lampetra aepyptera*), as well as a diverse fish population. The creek meanders through the central portion of the property running from north to south. The main threats to the creek coming from the property would be erosion from the old horse crossing. The creek also serves as a conduit of spread for some of the invasive species, most notably Japanese stiltgrass and Chinese yam. Both of these species heavily infest much of the Lusk Creek Watershed, both above and below the property.

Cabin Site and Access Road

Part of the purpose of Wilderness Areas is to provide users with an opportunity to experience untrammelled nature. Included in that definition is the ability to escape from the signs of human habitation. Several aspects of this property are glaring reminders of human's influence on the landscape. The two most obvious examples are the old cabin site and the access road that leads from the NW corner of the property, through the upland old field, bisects the glade, and makes its way down to the cabin site.

The cabin site has a foundation of the old cabin, several other small structures, a watertank, a home-made sewer system, and a lot of trash and debris spread about. When the site was purchased by the Illinois Audubon Society, removal of the cabin and cleanup of this site was included in the

agreement. This is progressing, albeit very slowly. In addition to the debris at the cabin site, at least two wooden tree stands have been erected in trees on the property, the remnants of a travel trailer and lots of trash have been left at the lower end of the central old field, and a small structure was left near the entrance gate.

The access road is primarily grassed through the upland field and does not show signs of significant erosion at that point. Where the road bisects the glade, there is obvious erosion, leading to the road actually being rerouted to avoid the most severe erosion. The road continues past the cabin into the large field in the SW corner of the property, but has seen very little use lately and is being reclaimed by the adjacent forest. To allow access to the property (which is completely surrounded by Wilderness Area, though not technically part of the Wilderness yet), the access road meanders down through the Lusk Creek Wilderness before reaching the property. Currently, the only restrictions for use on that road occur at the boundary of the Audubon's property (a gate) and anyone can use the road to travel down through the Wilderness even if they are not using it to access the Audubon property.

SUMMARY ANALYSIS OF CURRENT SITUATION

Conditions and Trends

Overall, the site is very high quality with very few threats or management needs. However several threats do exist and need addressing through active management. Most notably are the threat of several different invasive species and the diminished wilderness character due to the remnants of human habitation.

The mesic and upland forests continue to mature and currently display little threat to progress. The bluffline and talus slopes are currently well protected from over use (though this should continue to be monitored) and are showing great signs of recovery (e.g. the current abundance of French's shooting star). Some horse traffic still occurs primarily along the creek at the lower portions of the talus slope and stiltgrass has invaded that area. The sandstone glades are high quality though they are potentially slowly being encroached by eastern red cedar and mesic hardwoods. The bottomland old fields are all transitioning into young regeneration stands. One bottomland field displays a minor infestation of autumn olive while another has a minor infestation of johnsongrass. The upland field has a moderate to severe infestation of autumn olive and is transitioning into a young regeneration stand, possibly leading to a reduction in its overall plant diversity. Bush honeysuckle has been found close by and is likely to invade the site in the near future. The gravel/sand bar and cane thicket are heavily invaded by Chinese yam and Japanese stiltgrass and are continually receiving new inputs of propagules from upstream. The cane thicket recently experienced a mass flowering and dieback episode and, while natural, may take a bit of time to return to the dense stand it was before.

Specific Impediments or Threats to Site Goals

MAJOR or PRIMARY

- Abundant amount of remnants of human habitation. Some of which are large and will be difficult to remove
- Autumn olive infestations in the old fields
- Inevitable introduction of Bush honeysuckle onto the site
- Heavy infestation of Chinese yam and Japanese stiltgrass in portions of the property and the inevitable reinfestation of both species from upstream
- Maintenance of diversity on upland old field

MINOR or SECONDARY

- Erosion from road bisecting glade community
- Woody encroachment into glade community
- Dieback and regeneration of cane thicket
- Closure of the road accessing the property

SUMMARY OF MAJOR MANAGEMENT CONCERNS

Upland Old Field

The upland old field was recognized by Jack White as being a hotspot of diversity for the property. This field, while currently in an open state, has an abundance of tree seedlings and saplings along with native and invasive shrubs. Maintaining the open nature of this habitat (and presumably the high diversity) will require input in the form of mechanical labor (hand cutting or mowing), chemical treatments of the autumn olive, or potentially the use of prescribed fire periodically. If one of the goals of the property is to enhance the 'Wilderness Experience' then maintaining this site in an open state may be in direct contrast with that goal. The forested system is more 'natural' for the location and easier to maintain, but may result in the loss of several species on site.

Regeneration of all old fields on property

Regenerating the remaining old fields on the property into forested systems is a desirable activity. These fields will likely regenerate themselves and saplings and seedlings already occur in these fields in good numbers. Removal of autumn olive will help ensure that the end product of the succession is a stand of native trees. Light seeded 'soft mast' species will likely dominate these regeneration sites if left unchecked. If a higher 'hard mast' component is desired, then supplementing the natural regeneration would be an option. This would result in a young forest with a higher abundance of oak and hickory species, but would require more input and labor.

Removal of Junk and Debris from Property

There is a lot of junk and debris on the property that should be removed to enhance the wilderness experience and reduce the signs of human habitation.

- Small shed with the truck camper-top near the entrance
- Buildings and junk associated with the cabin site, including concrete pads
- Travel trailer, tires, and small roof-shed in one of the lower fields adjacent to the creek
- Old septic system running from cabin to edge of one of the lower old fields
- Two culverts across the creek
- Chainlink fence along boundary
- Tree stands and various other small structures (there is at least two old wooden tree stands on the property)

This will either be a time consuming or expensive endeavor (or both). Volunteer clean up days and 'adopt-a-site' stewards would help especially with the small stuff and general trash clean-up, but the bigger things and the septic system may need larger equipment or more 'expert' removal. Since the site is surrounded by USFS Wilderness Area, they could potentially be a partner in this endeavor.

Glade Community

The glade community is still very high quality. Little evidence existed of invasive species moving in to the community with the exception of small Japanese honeysuckle spots. Some encroachment of eastern red cedars and mesic hardwoods is evident, but, at this point, not a serious threat to the glade. Occasional cutting of the cedars and mesic hardwoods might be warranted, though a low priority.

Cane Stand Regeneration

The extensive river cane stand along the creek seems to have undertaken one of the periodic mass flowering and dieback events. This is a natural part of the community and the site should recover on its own fairly quickly. One potential way to prevent future mass dieback would be to increase the genetic diversity of the cane stand through supplemental planting. Since this is a unique and desirable community, the population could be expanded through some selective thinning of adjacent smaller trees or by allowing the cane to colonize the adjacent lower old field.

Invasive Species Management

The property has its share of invasive species, but, with the exception of the area immediately adjacent to the creek, the site is not overrun with problems and should be somewhat simple to manage. Autumn olive was present in upper and central old fields. The autumn olive in the upper old field has drastically increased in abundance since two years ago. This infestation, if left unchecked, would undoubtedly dominate the field within a few years. Fortunately, control of autumn olive at this level of infestation is somewhat straight forward and easily accomplished.

Multiflora rose and Japanese honeysuckle are in low densities but well distributed across the site. These are not serious threats to the site, however treating some of the multiflora rose to keep it in check can prevent it from invading the old fields or forming dense stands in the bottomland forests.

Japanese honeysuckle on the glades should be monitored periodically to evaluate the threat to the glade and steps taken if necessary.

Chinese yam and Japanese stiltgrass are both very abundant along the entire Lusk Creek riparian area, including within this property. Both are in fairly high abundance, though stiltgrass presents a greater threat and greater management challenge. Unfortunately eradication of either species from the site is not feasible due to both being very well established and having a constant seed source upstream for continual reinvasion. Management of both of these species should focus on spread prevention and containing the infestations to their current locations. In the future, if a larger management project that focuses on these two species is desirable, then a partnership with the Shawnee National Forest and the Illinois Department of Natural Resources is a must to address these species at a watershed level.

Bush honeysuckle is very abundant along the top portions of the road leading down to the property. This species poses a serious threat to the forests on the property and a monitoring program should be implemented to detect and eradicate this and any other new infestations of invasive species.

DETAILED ANALYSIS OF MANAGEMENT RECOMMENDATIONS

Upland Old Field

As stated above, the upland old field was identified by Jack White as a 'hotspot' of diversity. The field, while diverse and home to many native species, is an unnatural assemblage that has been maintained through management, particularly mowing or haying. Currently the field has an abundance of native tree seedlings regeneration and, with autumn olive control, will succeed into an upland forest if allowed to.

A moderate to severe infestation of autumn olive currently threatens to reduce that diversity and to impede tree regeneration in the upland old field. The first priority for management of the upland old field would be to continue to control the Autumn olive infestation (see more details about the specifics of autumn olive control in the "Invasive Species Control" section below and in Appendix B).

During the summer of 2011, partial treatment of the upland old field autumn olive was conducted and most of the mature plants removed. Retreatment of the autumn olive should be conducted annually until all plants have been removed and few/no sprouts remain. Once that is accomplished, the site can be monitoring once every 2-3 years to remove any new specimens colonizing the site. Autumn olive is abundant throughout the region, so reinfestation is inevitable.

The upland old field can be managed in two different directions: 1.maintain high diversity through disturbance of site or 2.allow the field to regenerate into upland forest. The first option will require input of disturbance on a 2-3 year continual cycle. The second option would require some initial

input of labor, but would succeed into a young regeneration and eventual mature forest that would require little if any additional input.

Recommended Direction

My recommendation would be to allow the stand to regenerate into native trees, while controlling the autumn olive on site. The area would likely start out transitioning into a semi-open shrubland dominated by sumac and tree saplings. The relatively poor soils in the upland site would keep the area open longer than the bottomland sites, but it would eventually create a fairly closed canopy forest.

This direction is relatively hands-off and will result in a more 'pristine' nature for the site, which is in line with the goal of enhancing the Wilderness experience at the site. If the site will eventually be designated as part of the Lusk Creek Wilderness, then this method is by far the best as setting back succession in the upper field within a designated wilderness area using any method other than prescribed fire would be nearly impossible.

Alternative Direction

If the Illinois Audubon Society decides to manage the upland old field as an open habitat to maintain species diversity on site, then an initial mowing of the site with a bushhog should be conducted after the first round of autumn olive treatments are completed. Bushhogging the site will not kill most of the tree and shrub seedlings in the field, rather it will keep them cut low to the ground and in a 'grub' stage. This leads to more aggressive sprouting and a need for more frequent mowing.

An initial cut stump treatment of some of the more aggressive woody species (sumac, elm, ash, etc.) would allow for the return interval between mowings to potentially stretch from 3-5 years. Mowings should be done in fall, to allow for the native herbaceous species to flower and produce fruit.

Alternatively, the possibility of prescribed fire should be explored. Prescribed fire is perhaps the easiest method of setting back succession. Burns should be every 2-3 years and ideally in late spring (though the occasional fall burn would also be beneficial).

Regeneration/Management of all Old Fields

Three different approaches to encouraging tree regeneration of the old fields can be utilized:

1. Passive regeneration (let it naturally regenerate itself and close in over time)
2. Direct seeding (shifting the composition of the natural regeneration to include more of the heavy-seeded species such as oak and hickory through hand spreading lots of seed)

3. Site prep and planting of seedlings (this is likely the most 'sure' way of determining the species composition but it is the most heavy-handed and expensive and the trees are in rows, though that is less noticeable as they mature)

Recommended Direction

The remaining old fields (see Figure 2 for worksite map) on the property should be able to regenerate naturally into forested systems without much input. The abundance of saplings and seedlings that already occur in the fields will speed the transition along. When present, autumn olive should be removed (using the control recommendations found in Appendix B). This method of passive regeneration is the easiest, most hands-off approach and, with autumn olive control, will result in a stand dominated by native species. The stands would not be considered a high quality forest because of the dominance of 'weedy' species such as wild black cherry (*Prunus serotina*), sassafras, elm, etc.

Alternative Direction

If the seedling mix is not supplemented, the fields will initially transition into a young forest dominated by light seeded 'soft mast' species. Over time, more of the hard mast species will move into the fields, but the sights will likely be dominated by soft mast species for the foreseeable future. If a higher 'hard mast' component is desired, then supplementing the natural regeneration would be an option. This would result in a young forest with a higher abundance of oak and hickory species, but would require more input and labor. Hand collecting acorns and hickory nuts from the adjacent woods and direct seedling them into the old fields is a great project for a boy scout troop or volunteers and is inexpensive and easy to do. Hand collecting and direct seedling should be done in the fall after the nuts have fallen from the trees.

I would not recommend the site prep and planting of seedlings on this site. The old fields already have an abundance of seedlings and saplings and the site prep and planting of seedlings would be very expensive and time consuming.

Removal of Junk and Debris from Property

The junk removal from the site will require a lot of labor and time input. However, removing these signs of human habitation is necessary to meet the site goal of enhancing the Wilderness character of the land (see figure 2 for map of primary trash collection sites).

Most of the junk can be extracted by hand with a crew of dedicated volunteers and removed in the back of a pickup truck. Only a small portion of the work would require larger equipment or some type of specialty.

For volunteer work days, the priority for cleanup (based upon ease of removal and visibility would be:

1. Small shed with the truck camper-top near the entrance
2. Junk associated with the cabin site
3. Tree stands and various other small structures
4. Junk (tires, cans, trash) and debris around travel trailer in lower field
5. Chainlink fence along boundary

Illinois Audubon should provide leather gloves for all volunteers at any workday scheduled as well as have a first aid kit on hand for any cuts or scrapes received while moving the material.

If possible, when cleaning up the trash and debris around the travel trailer, a trail should be mowed through the grass for the volunteers' comfort and tick avoidance. The soil should be relatively dry when conducting any of these workdays to avoid rutting or erosion.

The larger items of debris may need large equipment and more expert removal. As part of the purchase agreement for the property, the previous landowner agreed to remove the cabin and some of the larger debris around it. While this has been an extremely slow process, progress is being made. Because of that, I would place this as a low priority for Illinois Audubon and instead focus on the other items. Priority ranking for cleanup of larger items would be:

1. Travel trailer, tires, and small roof-shed in one of the lower fields adjacent to the creek
2. Two culverts across the creek
3. Old septic system running from cabin to edge of one of the lower old fields
4. Cabin site

All of these items are either large or difficult to access. If the soil moisture is dry, a tractor or larger 4x4 truck would be needed to pull the travel trailer out of the old field. The culverts need to be winched or dragged out and the county health department should be consulted for the appropriate methods needed for the removal of the septic system. Because of this, I would recommend contracting with a company that has the ability to remove these larger items easily while minimizing impacts to soil and vegetation. Ideally, a grant would be available to help pay for these efforts.

While there is not necessarily a time constraint for this effort, I would recommend making it a priority for the site, simply because the cleanup is going to be a long process that will take a lot of labor and multiple trips to finish. Expect the cleanup efforts to span at least 2 years.

Since this site is surrounded by Shawnee National Forest Wilderness Area, a partnership between the Illinois Audubon and the Shawnee NF should be sought to help conduct or at least fund the cleanup efforts.

Management of Glade Community

The high quality sandstone glade communities present on the property show little evidence of imminent threats. The glades should be surveyed every 2-3 years to evaluate their current condition and to determine if 1. the Japanese honeysuckle population is increasing enough to

warrant control, 2. any new invasive species have colonized the glade, and 3. the cedar and mesic hardwoods are encroaching into the glade community.

If the Japanese honeysuckle is deemed a threat (which it is not at this point, as it only occurs in very low densities on the glades), then control measure should be implemented. Since this control work would be within a high-quality community, care should be taken to avoid non-target impacts. Cut stump treatments of the larger vines with hand-pulling of smaller vines is an effective and safe method for controlling Japanese honeysuckle. For resources on controlling Japanese honeysuckle, see Appendix B.

For any new invasive species that may colonize the glade, determine the appropriate control methods for that species by consulting an invasive species expert of relevant literature. See Appendix C for a list of resources.

The presence of young seedlings growing within the glade is the best indicator of encroachment. Cedars and mesic hardwoods would be the primary encroachers. Care should definitely be taken not to confuse woody glade species, such as dwarf hackberry, with encroaching tree species. These evaluations should be done by someone familiar with the different tree species and the ecology of glade systems. Any encroaching cedars can be simply cut and dragged off of the glade. Hardwoods, if small enough, can be handpulled, as long as pulling them up doesn't disturb the soil excessively, or cut and treated. Most hardwoods will sprout vigorously after being cut and an application of herbicide can be very safe and effective and limiting sprouting. It should be noted that treatment of encroaching woody species is not expected to be a common occurrence. The poor soils and bare rock within the glade system is usually sufficient to prevent establishment of most of the undesirable species.

Management and Regeneration of Cane Stands

The mass flowering and dieback of the monocarpic perennial river cane can be a visually frightening experience. At first it appears that large swatches of the cane thickets have suddenly died without reason. However, this is a normal part of the ecology and phenology of this species and the stand should naturally regenerate on its own with any intervention. Discussions on how to prevent such events lead to the idea of supplementing the genetic and phenological diversity of a cane thicket to prevent future mass flower events. This does not appear to be the best method of natural management of cane, as these mass flowering events are a natural part of their ecology and may be necessary for reproduction and long-term survival of a population.

Local expansion of a population is typically by asexual reproduction (rhizomes) leading the population to expand through the local suitable habitat. One potential method of enhancing the cane stands on the property would be to slightly thin the trees adjacent to the cane thicket to promote rhizomatous growth at the periphery of the population. In addition, the majority of the cane stand on the property occurs adjacent to the large bottomland old field. As this field succeeds into trees, the heavy grass component will be reduced allowing the cane to better growing into the

field. This can be encouraged via very light thinning of the establishing saplings and small trees at the edge of the field.

Recommended Direction

The recommended management direction for the cane stands, would be a hands-off to allow natural regeneration of the stand with the addition of the light thinnings adjacent to promote expansion of the population

Alternative Direction

If supplemental planting to enhance the genetic diversity and vary the phenology of the stand is desirable, the Illinois Audubon should contact either Cypress Creek NWR or Southern Illinois University Forestry Department for information about accessing cane plugs.

Invasive Species Management

In general, invasive species management should be divided into three different categories, eradication, control, and containment. Eradication would be the complete removal of an invasive species off of the property. Bush honeysuckle would fall into this category. Control, would be the situational control of an invasive species, depending upon the local conditions, impacts, and trajectory of the population of the invasive species. Control practices are initiated when the species is causing significant negative impacts. The rest of the time, the manager just 'lives with' the species. While total eradication is not the endpoint nor often feasible, the goal of control is still the removal of the negative impacts of that invasive species from the property. Autumn olive and Japanese honeysuckle are examples of species in this category. Containment is the strategy used with widespread and damaging invasive species. With this strategy, the manager concedes the heavily infested areas and instead focuses on preventing the spread of the invasive species into new areas (the 'Line in the Sand' approach). Japanese stiltgrass is an example of a species where containment would be appropriate at this site.

Invasive species management is always more successful, easier, and cheaper to conduct if started early. If a population of an invasive species is found, the manager should not delay actions until the next season. The best way to prevent or reduce the negative impacts of invasive species is swift action to treat any new infestations and initiating management applications in a timely manner.

Species denoted for each category on the property include:

Eradication

- Bush honeysuckle
- Any new invaders

Control

- Multiflora rose
- Japanese honeysuckle
- Autumn olive
- Johnsongrass
- Sweet clover

Containment

- Japanese stiltgrass
- Chinese yam

Over time, as the onsite habitat changes and the populations of the different invasive species shift, species may be moved between the categories. The Illinois Audubon should reevaluate this list of species every 5 years to determine if priorities need to be shifted.

In general, the three highest priority actions in terms of invasive species management on the property would be:

- 1. Monitoring and control of all bush honeysuckle**
- 2. Control of autumn olive from old fields**
- 3. Containment of Japanese stiltgrass, particularly preventing it from spreading into the slope and upland forests**

Other, but lower priority invasive plant management actions include: Japanese honeysuckle control in the sandstone glades, multiflora rose control in the old fields and bottomland forests, and Chinese yam containment to the riparian areas.

Typical practices involved in invasive species management include:

- **Survey and mapping – looking for and recording locations of invasive species**
- **Monitoring – watching an infestation over a period of time to determine trajectory or detect changes**
- **Mechanical control – using non-chemical means to control invasive plants. This typically involves hand pulling, or the use of some type of leveraging device.**
- **Chemical control – using herbicides to kill invasive plant species, often combined with mechanical treatments such as cutting.**

Over time, after initial treatments of invasive species, the Illinois Audubon Society should implement a monitoring program for invasive species on the property. Invasive species populations should be assessed at least every three years, ideally more frequently. This would be an excellent job for a volunteer site steward or through involvement in the Illinois Weed Watch Program (see www.rtrcwma.org for more information on the volunteer Weed Watch Program)

Bush Honeysuckle

The first priority for invasive species control on site should be bush honeysuckle. While bush honeysuckle wasn't found on the property during the 2011 surveys, it was located within the USFS along the road leading to the Audubon property.

Bush honeysuckle has the potential, perhaps more than any other invasive species, to invade and alter high quality forested systems. Bush honeysuckle invasions can drastically alter the understory and shrub layer plant composition, form an almost impenetrable thicket of shrubs, nearly eliminate all tree seedling establishment, and reduce the growth rate of the mature trees by as much as 50%. In addition, invasions can serve as sinks for populations of frugivorous birds. The dense shrub layer attracts birds, causing them to choose these areas as nesting sites, but the structure of bush honeysuckle and the poor nutrition of the fruits lead to reduced nesting success and increased predation. These types of infestations are already being seen in southern Illinois, so early detection and prevention are the best long-term strategies for management.

The site should be thoroughly monitored for bush honeysuckle at a minimum of every three years, ideally at least once every year or two. The most efficient time to survey for bush honeysuckle is late fall, after leaf-off of the native trees and shrubs but before bush honeysuckle has dropped its leaves. The middle two weeks in November is the typical time for that to happen.

Remove all bush honeysuckle individuals found during these surveys. Small shrubs can be easily hand pulled, larger shrubs can either be wrenched out of the ground using a weed wrench or cut and treated with herbicide to prevent future sprouting (see Appendix B for specifications on treatments).

This should not be a huge time commitment, likely taking less than one day every two years.

In addition, partnering with the Shawnee NF to survey and control bush honeysuckle outside of the Audubon property will help prevent future invasions. If the adjacent lands are allowed to become heavily invaded, then detecting and controlling bush honeysuckle on the Audubon land will require more annual input.

Autumn Olive

Autumn olive has the potential to completely dominate openlands, restricting light to understory species and limiting tree seedling establishment. The autumn olive has drastically increased the last two years on the property, a stand of mature plants was located in the upland old field along with a dispersed population of seedlings and young saplings. Some of the other old fields also had autumn olive present.

Autumn olive control within the old fields, and particularly in the upland old field, should be a priority. Work has already been initiated to control these populations. This should continue with all of the autumn olive individuals treated before next growing season. The first year or two of treatments will likely require a more considerable time commitment. After that, annual treatment applications should be conducted to control the infestations.

After the first 2-3 years of treatment, the time commitment to control the autumn olive should diminish significantly. Over time, as the fields succeed into a forest and the canopy closes, the habitat suitability for autumn olive establishment will be severely reduced, rendering the impacts of autumn olive on the site nearly negligible. Autumn olive individuals should be noted during the regular invasive species monitoring on site and treated as necessary. For information on identification and control of autumn olive, see Appendix B.

Japanese Stiltgrass

Japanese stiltgrass has heavily invaded the riparian areas, cane thickets, and gravel/sand bar habitats on the property. This is an aggressive species that will continue to spread if left unchecked. Japanese stiltgrass can dominate a forest understory and drastically shift the community. This is one of the highest priority species in the region.

Because of the extensive infestations of stiltgrass along the creek upstream of the property, eradication or even control is not feasible. Containment is the best strategy for this highly invasive and dense population. The upland areas of the property should be surveyed every year or two and any infestations of Japanese stiltgrass outside of the creek riparian area should be aggressively controlled. The old road leading down from the cabin to the creek is an ideal place to find stiltgrass spreading into the uplands. Deer trails and small drainages are also likely places of spread. It should be noted that stiltgrass can also be found nearly anywhere so surveys should not be restricted to only the old road, deer trails, and drainages.

Since the creekside population is so well established, this work will not diminish over time. Stiltgrass will continue to spread into the uplands if left unchecked. The time commitment necessary for this task depends upon how much is found in the uplands each year. It cannot be emphasized enough the early detection and rapid response of new infestations is crucial to containing this species and limiting its negative impacts on the property. For information on identification and control of this species, see Appendix B.

Chinese Yam

Chinese yam is heavily invading the riparian areas in the entire Lusk Creek Drainage, including this property. It moves very effectively via floodwaters and will quickly colonize any non-invaded lowlands. It does not move as effectively out of the riparian areas because of the size of the bulbils.

The Southern Illinois Invasive Plant Strike Team has conducted two treatments for yam on the site. While the yam has decreased in density because of these treatments, reinfestation is inevitable because of the large propagule sources upstream. It is recommended to continue to work with the Strike Team for treatments, but shift away from a control-based approach to containment of Chinese yam into the riparian areas. The principles are similar to those mentioned for Japanese stiltgrass above. It should be noted that Chinese yam is a damaging invasive, but not as high of a priority as Japanese stiltgrass.

Other Invasive Species on Site

Johnsongrass is invading the large bottomland old field, but is being slowly replaced by tree seedlings and blackberry brambles. It is expected that this population will eventually dwindle to non-existence as the trees close canopy. The population should be monitored to watch for any shift in the population trajectory. This is only likely to happen if some large disturbance happens on the site (such as mowing the field or an extensive blowdown). Resources for controlling johnsongrass can be found in Appendix C.

Multiflora rose occurs in low densities throughout the property, but does not appear to be an imminent threat. As was mentioned earlier in this document, multiflora rose populations should be monitored every 2-3 years to determine if any negative impacts are occurring. If the population is increasing or specific impacts are found, then the species should be controlled. The most likely locations to see negative impacts of multiflora rose would be the old fields and moist bottomland forests, particularly following disturbance. Resources for controlling multiflora rose can be found in Appendix C.

Japanese honeysuckle is very common throughout the property, though in low levels. Japanese honeysuckle is not considered a major threat to most of the habitats within the property. The one exception is the glade community. It but should be managed according to the details outlined in the Glade Community section above. Resources for controlling Japanese honeysuckle can be found in Appendix C.

Sericea lespedeza and sweet clover are both invaders of openlands. Sericea lespedeza is an especially major invader. Both of these species require high light environments to flourish. With the succession of the old field habitats into young tree generation sites, both of these invaders are expected to drop in abundance and impact. Thus, no immediate action is recommended. If the upland old field is managed to maintain an open state, the Sericea should be controlled to prevent it from spreading throughout the field. Resources for controlling both Sericea lespedeza and sweetclover can be found in Appendix C.

Additional Management Recommendations

Erosion on Access Road Through Property

The access road is mostly erosion free throughout the property with the exception of when it bisects the sandstone glade. Traffic through the road has caused localized moderate erosion at this point. The erosion was impactful enough that the road was rerouted to avoid the steep gully created by the erosion. Now the rerouted lane is also showing signs of erosion. The road at this point is infrequently used but does get some traffic from Audubon staff and one of the former property owners who is still working on cleanup at the site. The erosion is localized and does not infer a serious threat, it will likely continue if traffic is maintained down the road, especially in muddy conditions. It is recommended that the Audubon Society instructs all users of the site to

stop their vehicles above this location when the road is wet and to limit traffic through the location during dry times to necessary purposes only.

Closure of Access Road Leading to Property

To allow access to the property (which is completely surrounded by Wilderness Area, though not technically part of the Wilderness yet), the access road meanders down through the Lusk Creek Wilderness before reaching the property. Currently, the only restrictions for use on that road occur at the boundary of the Audubon's property (a gate) and anyone can use the road to travel down through the Wilderness even if they are not using it to access the Audubon property. The Illinois Audubon should work with the Shawnee National Forest and the Pope County Highway Department to explore options for adding a locked gate at the beginning of the Wilderness Area Designation. Having such a locked gate would remove traffic from the road, enhancing the Wilderness character, while still providing access for Audubon to work on the property

Protection of the Bluffline and Talus Slope Habitat

The bluffline and talus slope habitat is very high quality and home to rare resources. Care should be taken to continue to protect this habitat. Use by horse riders is the primary threat for the site, though invasive species also threaten. The site should be periodically monitored and action should be taken if impactful use by horse riders is evident. Signage along the trails at the property boundary alerting users that horse use is restricted and targeted blocking of existing user-created trails onto the site would help reduce horse use if needed. The bluffline and talus habitat should be visited and monitored for invasive species in the efforts detailed in the Invasive Species section above.

TIMELINE AND PRIORITY RECOMMENDATIONS FOR PLAN IMPLEMENTATION

This management plan is written to address the next five years of management at the Illinois Audubon's Lusk Creek Property. Below is a suggested timeline for the recommended management actions as well as an estimate of the time input needed to accomplish the actions. The time input needed for management diminishes over time. Year 1 will require approximately 44-57 hours of staff labor and an additional 60-90 hours volunteer labor. Year 2 will require approximately 26-39 hours of staff labor and an additional 20-60 hours volunteer labor. Year 3 will require 14-39 hours of staff labor and an additional 0-30 hours volunteer labor. Year 4 will require 8-11 hours of staff labor. Year 5 will require 11-24 hours of staff labor. These are all estimates for the time needed to implement this plan. The actual time needed may vary.

This timeline is laid out in priority ranking, with the first items mentioned in the year, being the highest priority.

Year 1 (2012)

- Control existing autumn olive in old fields
 - 10-15 hours labor
- Conduct 2 volunteer workdays to cleanup trash and debris
 - 20 hours labor (an additional 40-60 hours of volunteer labor)
- Conduct volunteer workday for seed collection and direct seeding into old fields
 - 10 hours labor (an additional 20-30 hours of volunteer labor)
- Contact Shawnee NF about adding additional gate to access road
 - 2-10 hours labor
- Inform all site users of erosion potential of road and need to avoid area
 - 2-3 hours labor

Year 2 (2013)

- Control existing autumn olive in old fields
 - 10-15 hours labor
- Conduct 1 volunteer workday to cleanup trash and debris
 - 10 hours labor (an additional 20-30 hours volunteer labor)
- Conduct workday or contract with company to remove large trash and debris
 - 2-10 hours labor (an additional 0-30 hours volunteer labor)
- Monitor cane thicket regeneration
 - 2 hours labor
- Inspect bluffline and talus slopes for signs of excessive horse use
 - 2 hours labor

Year 3 (2014)

- Control existing autumn olive in old fields
 - 5-10 hours labor
- Survey property for invasive species
 - 6 hours labor
- Treat any bush honeysuckle or other new invader found on property(or new locations of Chinese yam or Japanese stiltgrass)
 - 0-5 hours labor
- Conduct 1 volunteer workday to cleanup trash and debris (If necessary)
 - 0-10 hours labor (an additional 0-30 hours volunteer labor)
- Inspect glade for encroachment of Japanese honeysuckle, cedar, and mesic hardwoods, manage glade if necessary
 - 1-4 hours labor
- Lightly thin wooded areas adjacent to cane thicket (If applicable)
 - 2-4 hours labor

Year 4 (2015)

- Control existing autumn olive in old fields
 - 2-5 hours labor
- Monitor cane thicket regeneration
 - 2 hours labor
- Inspect bluffline and talus slopes for signs of excessive horse use
 - 2 hours labor
- Inspect old fields to evaluate tree regeneration
 - 2 hours labor

Year 5 (2016)

- Control existing autumn olive in old fields
 - 2-5 hours labor
- Survey property for invasive species
 - 6 hours labor
- Treat any bush honeysuckle or other new invader found on property(or new locations of Chinese yam or Japanese stiltgrass)
 - 0-5 hours labor
- Inspect glade for encroachment of Japanese honeysuckle, cedar, and mesic hardwoods, manage glade if necessary
 - 1-4 hours labor
- Lightly thin regeneration in old field immediately adjacent to cane thicket (if applicable)
 - 2-4 hours labor

PLAN SUMMARY

This 5-year management plan identifies the valuable resources on the property and the goals that the Illinois Audubon Society has set for the site. In addition, the plan identifies threats to these goals and management concerns for the property. The plan gives detailed management recommendations that are realistic and doable and a prioritized timeline for implementation of the plan.

The major threats to the goals of the property are the junk and debris present on the site and invasive species infestations, particularly autumn olive, bush honeysuckle, and Japanese stiltgrass.

The primary actions recommended in the plan are control of the autumn olive in the old fields, the use of volunteer workdays to remove the junk and debris from the property, development of a program to monitor and treat other invasive species as necessary, the containment of Japanese stiltgrass and Chinese yam to the riparian areas, the regeneration of the old fields and cane thickets, the monitoring of the glade community, the continued protection of the bluffline and talus slope communities, and the reclamation and eventual closure of the access road.

The recommended timeline for implementation of this plan is front-loaded with the majority of the work being conducted in the first two years. The remaining three years involves mostly monitoring and reacting to changes in the status of the threats to the property.

Finally, the plan includes a series of appendices for information on the native plant species present at the site, the identification and control of invasive species, and information on additional resources used in conservation and management.

This plan takes an adaptive approach to management, with an emphasis on monitoring and reacting to the changing situations. This is a 5-year plan, after that the management of the property should be reevaluated and a new plan developed.

Figure 1 – Habitat Type Map of Site

Lusk Creek Sanctuary Habitat Types



1 inch = 0.05 miles

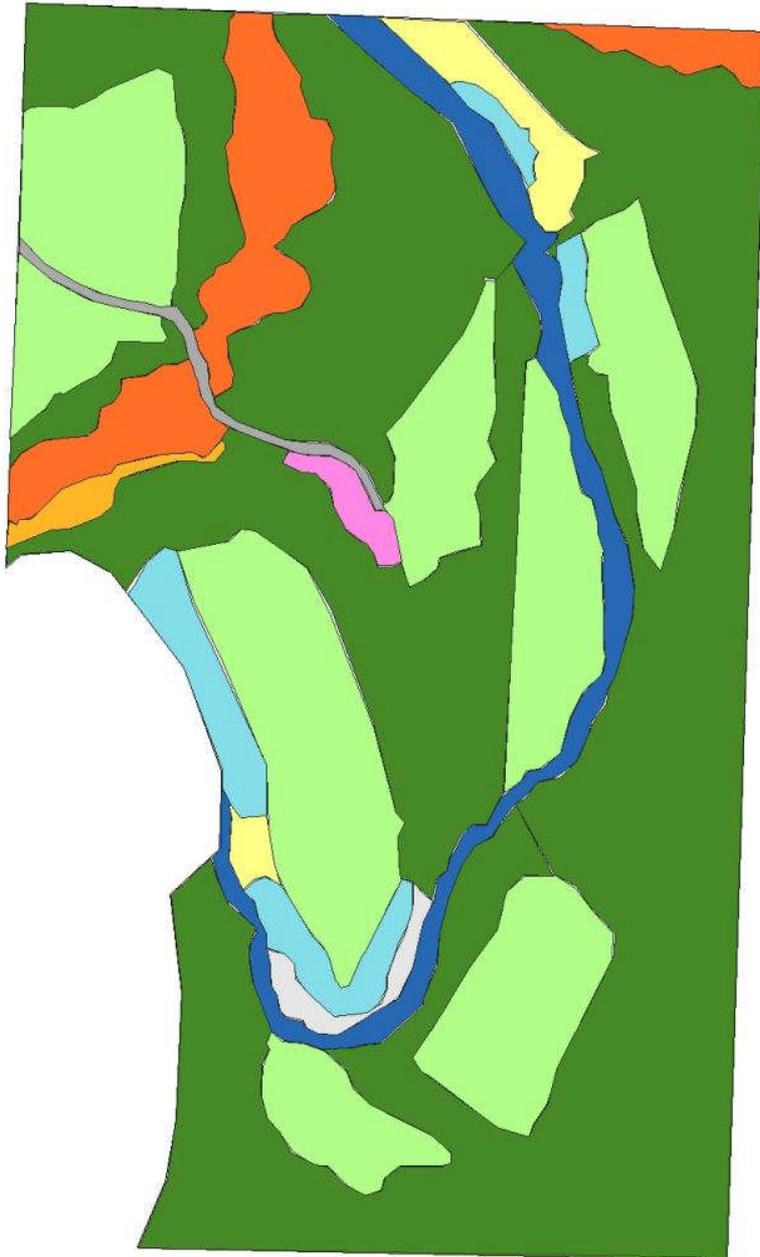
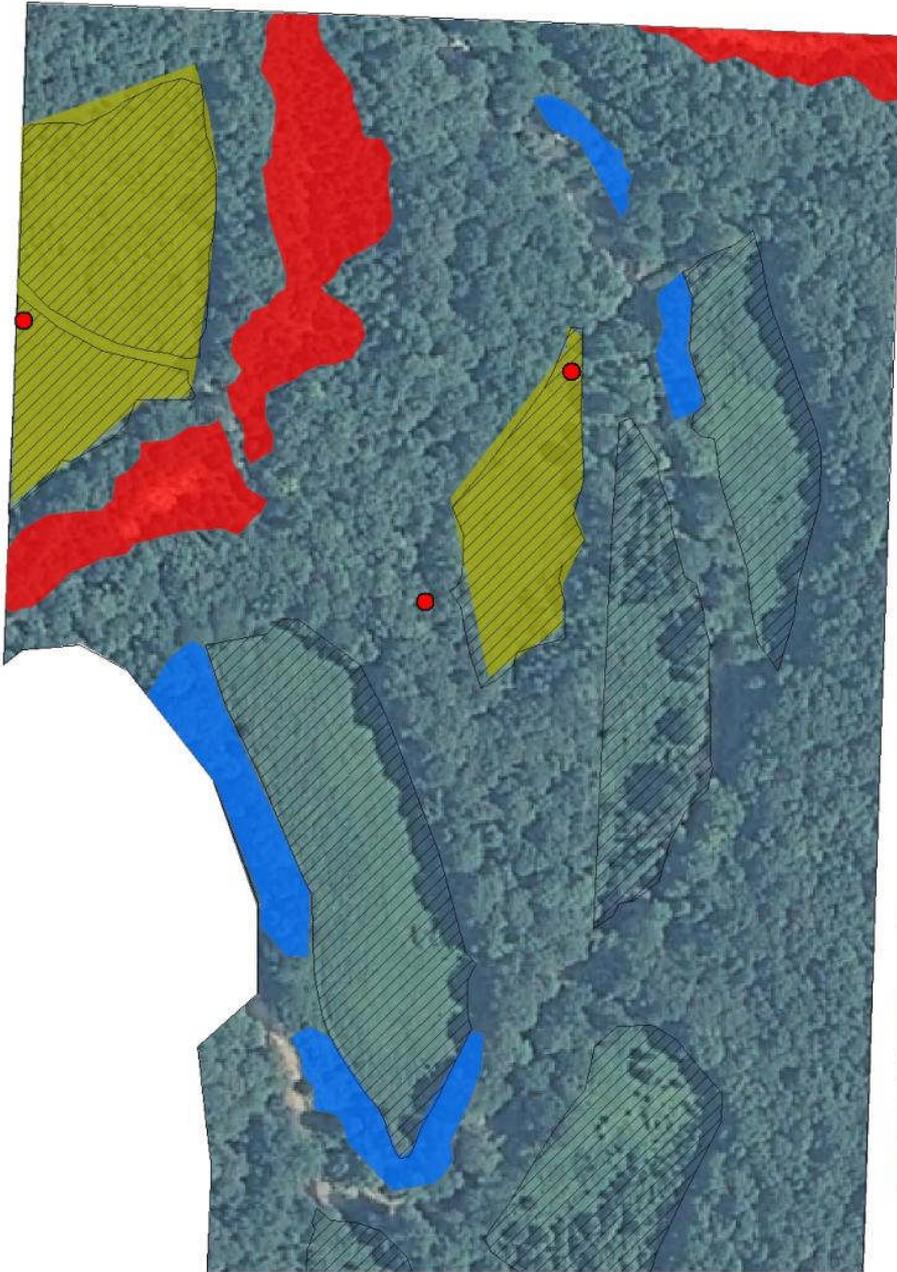


Figure 2 – Map of Primary Work Sites Addressed in Management Plan

Lusk Creek Sanctuary Primary Work Sites



1 inch = 0.04 miles



Work Type

- Trash Cleanup
- Invasion Site
- ▨ Old Field
- Glade
- Cane Stand

**Appendix A. Plants listed by group,
then family.**

(White 2010)

* - denotes highly invasive species

FERNS AND FERN ALLIES

Aspleniaceae

Asplenium platyneuron var. platyneuron

Asplenium rhizophyllum

Blechnaceae

Woodwardia areolata

Dryopteridaceae

Athyrium filix-femina

Deparia acrostichoides

Diplazium pycnocarpon

Dryopteris goldiana

Dryopteris marginalis

Onoclea sensibilis

Polystichum acrostichoides

Woodsia obtusa

Equisetaceae

Equisetum arvense

Isoetaceae

Isoetes melanopoda

Ophioglossaceae

Botrychium obliquum var. obliquum

Botrychium virginianum

Polypodiaceae

Polypodium virginianum

Pteridaceae

Adiantum pedatum

Cheilanthes lanosa

Thelypteridaceae

Phegopteris hexagonoptera

MONOCOTS

Agavaceae

Manfreda virginica

Yucca smalliana

Alismataceae

Alisma subcordatum

Amaryllidaceae

Hypoxis hirsuta

Araceae

Arisaema dracontium

Arisaema triphyllum ssp. triphyllum

Commelinaceae

Commelina communis

Tradescantia subaspera var. subaspera

Tradescantia virginiana

Cyperaceae

Carex abdita

Carex albicans

Carex albursina

Carex amphibola

Carex blanda

Carex brachyglossa

Carex bushii

Carex caryana

Carex cephalophora

Carex crinita var. brevicrinis

Carex digitalis

Carex festucacea

Carex frankii

Carex glaucoidea

Carex grisea

Carex hirsutella

Carex jamesii Carex laxiculmis

Carex lurida

Carex muhlenbergii

Carex oxylepis var. pubescens

Carex retroflexa

Carex rosea

Carex swanii

Carex umbellata

Carex vulpinoidea

Cyperus echinatus

Cyperus erythrorhizos

Cyperus strigosus

Eleocharis ovata var. obtusa

Eleocharis verrucosa

Fimbristylis autumnalis

Kyllinga pumila

Scirpus cyperinus

Scirpus georgianus

Dioscoreaceae

Dioscorea oppositifolia*

Dioscorea quaternata var. quaternata

Dioscorea villosa

Iridaceae

Sisyrinchium albidum

Juncaceae

Juncus acuminatus

Juncus biflorus var. biflorus

Juncus brachycarpus

Juncus diffusissimus

Juncus effuses var. solutus

Juncus interior

Juncus marginatus

Juncus secundus

Juncus tenuis

Luzula multiflora

Liliaceae

Allium canadense var. canadense

Allium vineale

Erythronium albidum

Lilium superbum

Nothoscordum bivalve

Polygonatum biflorum

Polygonatum commutatum

Smilacina racemosa

Trillium flexipes

Trillium recurvatum

Uvularia grandiflora

Orchidaceae

Aplectrum hyemale

Platanthera lacera

Poaceae

Agrostis elliottiana

Agrostis gigantea

Agrostis hyemalis

Agrostis perennans

Andropogon gerardii

Andropogon gyrans

Andropogon virginicus

Aristida dichotoma

Arundinaria gigantea

Bouteloua curtipendula

Brachyelytrum erectum

Bromus commutatus

Bromus inermis

Bromus pubescens

Chasmanthium latifolium

Cinna arundinacea

Dactylis glomerata
 Danthonia spicata
 Diarrhena obovata
 Dichanthelium acuminatum
 var. fasciculatum
 Dichanthelium boscii var. boscii
 Dichanthelium clandestinum
 Dichanthelium commutatum
 var. commutatum
 Dichanthelium depauperatum
 Dichanthelium dichotomum
 Dichanthelium laxiflorum
 Dichanthelium malacophyllum
 Dichanthelium microcarpon
 Dichanthelium scoparium
 Dichanthelium yadkinense
 Digitaria ischaemum
 Digitaria sanguinalis
 Echinochloa muricata var. muricata
 Echinochloa muricata var. wiegandii
 Eleusine indica
 Elymus hystrix var. hystrix
 Elymus riparius
 Elymus villosus
 Elymus virginicus var. glabriflorus
 Elymus virginicus var. virginicus
 Eragrostis pectinacea
 Eragrostis spectabilis
 Festuca arundinacea*
 Festuca subverticillata
 Glyceria striata var. striata
 Koeleria macrantha
 Leersia lenticularis
 Leersia virginica
 Melica nitens
 Microstegium vimineum*
 Muhlenbergia frondosa
 Muhlenbergia schreberi
 Muhlenbergia racemosa
 Muhlenbergia sobolifera
 Panicum anceps
 Panicum dichotomiflorum
 var. dichotomiflorum
 Panicum flexile
 Panicum virgatum
 Paspalum leave
 Paspalum setaceum var. setaceum
 Phalaris arundinacea
 Phleum pretense
 Poa compressa
 Poa pratensis

Poa sylvestris
 Schizachyrium scoparium
 Setaria faberi
 Setaria geniculata
 Setaria glauca
 Sorghum halepense*
 Sphenopholis obtusata
 Sporobolus vaginiflorus
 Tridens flavus
 Vulpia octoflora var. octoflora

Smilacaceae

Smilax bona-nox var. bona-nox
 Smilax bona-nox var. hederaefolia
 Smilax glauca var. ;europhylla
 Smilax pulverulenta
 Smilax rotundifolia
 Smilax tamnoides var. hisida

DICOTS

Acanthaceae

Justicia americana
 Ruellia humilis

Aceraceae

Acer negundo var. negundo
 Acer rubrum var. rubrum
 Acer rubrum var. trilobum
 Acer saccharum var. saccharum

Anacardiaceae

Rhus glabra
 Rhus copallina
 Toxicodendron radicans var. negundo
 Toxicodendron radicans var. radicans

Annonaceae

Asimina triloba

Apiaceae

Chaerophyllum procumbens
 var. procumbens
 Cicuta maculate
 Cryptotaenia canadensis
 Daucus carota
 Osmorhiza longistylis var. longistylis
 Sanicula canadensis var. canadensis
 Sanicula odorata
 Zizia aurea

Apocynaceae

Amsonia tabernaemontana
 var. tabernaemontana
 Apocynum cannabinum

Aquifoliaceae

Illex decidua

Araliaceae

Panax quinquefolius

Aristolochiaceae

Aristolochia serpentaria
 Asarum canadense var. reflexum

Asclepiaceae

Ampelmus albidus
 Asclepias exaltata
 Asclepias quadrifolia
 Asclepias syriaca var. syriaca
 Asclepias tuberosa spp. interior
 Matelea obliqua

Asteraceae

Achillea millefolium var. millefolium
 Ageratina altissima
 Ambrosia artemisiifolia
 Ambrosia bidentata
 Ambrosia trifida
 Antennaria plantaginifolia
 Anthemis cotula
 Arnoglossum atriplicifolium
 Aster lanceolatus var. simplex
 Aster lateriflorus
 Aster patens
 Aster pilosus
 Aster praealtus var. praealtus
 Aster sagittifolius
 Aster shortii
 Aster turbinellus
 Bidens aristosa var. aristosa
 Bidens aristosa var. fritcheyi
 Bidens bipinnata
 Bidens frondosa
 Bidens polyepis
 Cirsium altissimum
 Cirsium discolor
 Conoclinium coelestinum
 Conyza canadensis
 Coreopsis pubescens
 Coreopsis tripteris var. tripteris
 Eclipta prostrate

Elephantopus carolinianus
Erechites hieracifolia var. hieracifolia
Erigeron annuus
Erigeron philadelphicus
Erigeron strigosus
Eupatoriadelphus fistulosus
Eupatorium perfoliatum
Eupatorium serotinum
Euthamia graminifolia var. nuttallii
Gamachaeta purpurea
Helenium flexuosum
Helianthus divaricatus
Helianthus hirsutus
Helianthus microcephalus
Helianthus tuberosus var. tuberosus
Heliopsis helianthoides var. helianthoides
Hieracium gronovii
Hieracium longipilum
Iva annua
Krigia biflora
Lactuca canadensis var. canadensis
Lactuca canadensis var. latifolia
Lactuca floridana var. floridana
Lactuca floridana var. villosa
Lactuca hirsute var. sanguinea
Leucanthemum vulgare
Prenanthes altissima
Prenanthes aspera
Prenanthes crepidinea
Pseudognaphalium obtusifolium
Rudbeckia laciniata
Rudbeckia triloba
Senecio aureus var. gracilis
Senecio glabellus
Silphium perfoliatum
Solidago altissima
Solidago buckleyi
Solidago caesia
Solidago flexicaulis
Solidago gigantea var. leiophylla
Solidago juncea
Solidago missouriensis var. fasciculata
Solidago nemoralis
Solidago rugosa var. rugosa
Solidago ulmifolia
Verbesina alternifolia
Verbesina helianthoides
Verbesina virginica
Vernonia gigantea var. gigantea
Vernonia missurica
Xanthium strumarium var. glabratum

Balsaminaceae

Impatiens capensis
Impatiens pallida

Berberidaceae

Caulophyllum thalictroides
Podophyllum peltatum

Betulaceae

Alnus serrulata
Betula nigra

Bigoniaceae

Campsis radicans

Boraginaceae

Lithospermum latifolium
Mertensia virginica
Myosotis verna

Brassicaceae

Arabis canadensis
Arabis laevigata
Barbarea vulgaris var. arcuata
Dentaria laciniata
Draba reptans
Lepidium virginicum
Rorippa palustris
Thlaspi perfoliatum

Cactaceae

Opuntia humifusa

Callitrichaceae

Callitriche terrestris

Campanulaceae

Campanulastrum americanum
var. americanum
Lobelia cardinalis
Lobelia inflata
Lobelia puberula var. simulans
Triodanis perfoliata

Cannabinaceae

Humulus lupulus var. lupuloides

Caprifoliaceae

Lonicera japonica var. japonica*
Sambucus canadensis var. canadensis
Sambucus canadensis var. submollis
Viburnum prunifolium

Caryophyllaceae

Cerastium fontanum
Cerastium arvense var. villosum
Dianthus armeria
Silene stellata
Stellaria media

Celastraceae

Euonymus atropurpureus

Chenopodiaceae

Chenopodium album
Chenopodium ambrosioides

Cistaceae

Lechea tenuifolia

Convolvulaceae

Ipomoea hederacea
Ipomoea lacunosa
Ipomoea pandurata
Ipomoea purpurea

Cornaceae

Cornus florida
Cornus obliqua

Corylaceae

Carpinus caroliniana var. caroliniana
Corylus americana
Ostrya virginiana var. lasia
Ostrya virginiana var. virginiana

Crassulaceae

Sedum pulchellum
Sedum ternatum

Cucurbitaceae

Sicyos angulatus

Cuscutaceae

Cuscuta cuspidata
Cuscuta gronovii var. gronovii

Ebenaceae

Diospyros virginiana var. pubescens
Diospyros virginiana var. virginiana

Elaeagnaceae

Elaeagnus umbellata*

Ericaceae

Vaccinium arboretum var. arboretum

Euphorbiaceae

Acalypha gracilens var. gracilens

Acalypha rhomboidea

Acalypha virginica

Chamaesyce humistrata

Chamaesyce maculate

Croton capitatus

Crotonopsis elliptica

Euphorbia corollata var. corollata

Fabaceae

Amphicarpaea bracteata var. bracteata

Apios americana

Cercis canadensis

Chamaecrista fasciculata var. fasciculata

Chamaecrista nictitans

Crotalaria sagittalis

Desmodium canadense

Desmodium canescens

Desmodium cillare

Desmodium glabellum

Desmodium laevigatum

Desmodium marilandicum

Desmodium nudiflorum

Desmodium paniculatum

Desmodium rotundifolium

Gleditsia triacanthos

Kummerowia striata

Lespedeza cuneata*

Lespedeza intermedia

Lespedeza procumbens var. elliptica

Lespedeza repens

Medicago lupulina

Melilotus albus*

Phaseolus polystachios

Robinia pseudoacacia

Senna marilandica

Strophostyles umbellata

Stylosanthes biflora

Tephrosia virginiana var. holosericea

Trifolium campestre

Trifolium hybridum

Trifolium pratense var. pratense

Trifolium repens

Fagaceae

Fagus grandifolia var. caroliniana

Quercus alba

Quercus coccinea

Quercus imbricaria

Quercus marilandica

Quercus muhlenbergii

Quercus rubra

Quercus stellate

Quercus velutina

Fumariaceae

Corydalis flavula

Dicentra cucullaria

Gentianaceae

Frasera carolinensis

Sabatia angularis

Geraniaceae

Geranium carolinianum

Geranium maculatum

Hamamelidaceae

Liquidambar styraciflua

Hippocastanaceae

Aesculus glabra var. glabra

Hydrangeaceae

Hydrangea arborescens

Hydrophyllaceae

Hydrophyllum canadense

Hydrophyllum virginianum

Phacelia purshii

Hypericaceae

Ascyrum multicaule

Hypericum drummondii

Hypericum gentianoides

Hypericum mutilum

Hypericum prolificum

Hypericum punctatum

Juglandaceae

Carya cordiformis

Carya glabra var. glabra

Carya ovalis

Carya ovata var. ovata

Carya texana

Carya tomentosa

Juglans nigra

Lamiaceae

Agastache nepetoides

Blephilia ciliata

Blephilia hirsuta

Cunila organoides

Hedeoma pulegioides

Lamium purpureum

Lycopus virginicus

Monarda bradburniana

Perilla frutescens var. frutescens

Prunella vulgaris var. elongata

Prunella vulgaris var. vulgaris

Pycnanthemum pycnanthemoides

Pycnanthemum tenuifolium

Salvia lyrata

Scutellaria elliptica

Scutellaria incana

Stachys tenuifolia

Teucrium canadense

Trichostema dichotomum

Lauraceae

Lindera benzoin var. benzoin

Lindera benzoin var. pubescens

Sassafras albidum var. albidum

Sassafras albidum var. molle

Linum

Linum medium var. texanum

Loganiaceae

Spigela marilandica

Lythraceae

Rotala ramosior

Magnoliaceae

Liriodendron tulipifera

Malvaceae

Abutilon theophrastii

Sida spinosa

Menispermaceae

Menispermum canadense

Molluginaceae

Mollugo verticillata

Moraceae

Maclura pomifera

Morus alba

Morus rubra

Nyphaeaceae

Nuphar advena

Nyssaceae

Nyssa sylvatica var. caroliniana

Oleaceae

Fraxinus americana va. americana

Fraxinus pennsylvanica

Onograceae

Circaea lutetiana ssp. canadensis

Ludwigia alternifolia var. alternifolia

Ludwigia palustris var. americana

Ludwigia peploides ssp. glabrescens

Oenothera biennis

Oenothera linifolia

Oxalidaceae

Oxalis Fontana

Oxalis stricta

Oxalis violacea

Phrymaceae

Phryma leptostachya

Phytolaccaceae

Phytolacca americana

Plantaginaceae

Plantago lanceolata

Plantago rugelli

Plantago virginica

Platanaceae

Platanus occidentalis

Polygalaceae

Polygala sanguinea

Polygonaceae

Antenoron virginianum

Fallopia cristata

Fallopia scandens

Persicaria cespitosa

Persicaria pennsylvanica var. pennsylvanica

Persicaria punctata

Persicaria vulgaris

Polygonum arenastrum

Polygonum tenue

Rumex acetosella

Rumex obtusifolius

Tracaulon sagittatum

Polymniaceae

Phlox divaricata spp. laphamii

Phlox glaberrima spp. interior

Phlox paniculata

Polemonium reptans

Portulacaceae

Claytonia virginica

Primulaceae

Anagallis minima

Dodecatheon frenchii

Dodecatheon meadia

Lysimachia lanceolata

Ranunculaceae

Actaea pachypoda

Anemone virginiana

Anemonella thalictroides

Aquilegia canadensis

Cimicifuga rubifolia

Clematis virginiana

Delphinium tricorne

Hepatica acutiloba

Hydrastis canadensis

Ranunculus abortivus var. arbortivus

Ranunculus sardous

Thalictrum dasycarpum

Thalictrum revolutum

Rhamnaceae

Frangula caroliniana

Rosaceae

Agrimonia parviflora

Agrimonia rostellata

Amelanchier arborea

Crataegus pruinosa

Geum canadense var. canadense

Geum vernum

Porteranthus stipulates

Potentilla simplex var. simplex

Prunus americana

Prunus serotina

Rosa carolina

Rosa multiflora*

Rosa setigera var. tomentosa

Rubus allegheniensis

Rubus enslenii

Rubus flagellaris

Rubus occidentalis

Rubus pensilvanicus

Rubiaceae

Cephalanthus occidentalis

var. occidentalis

Diodia teres var. teres

Galium aparine var. aparine

Galium circaezans var. hypomalacum

Galium concinnum

Galium obtusum

Galium pilosum

Galium triflorum

Houstonia lanceolata

Houstonia pusilla

Salicaceae

Populus deltoids

Salix nigra

Saxifragaceae

Heuchera americana var. hirsuticaulis

Heuchera parviflora var. rugelii

Penthorum sedoides

Scrophulariaceae

Agalinus fasciculate

Agalinus tenuifolia

Aureolaria flava var. micrantha

Gratiola neglecta

Lindernia anagallidea

Mimulus alatus

Pedicularis canadensis var. canadensis

Penstemon pallidus

Scrophularia marilandica

Verbasicum thapsus

Veronicastrum virginicum

Solanaceae

Datura stramonium

Lycopersicon esculentum

Physalis pruinosa

Solanum carolinense

Solanum ptycanthum

Staphyleaceae

Staphylea trifolia

Tiliaceae

Tilia americana

Ulmaceae

Celtis laevigata var. laevigata
Celtis occidentalis var. canina
Celtis occidentalis var. occidentalis
Celtis tenuifolia var. tenuifolia
Ulmus alata
Ulmus americana
Ulmus rubra

Urticaceae

Boehmeria cylindrica var. cylindrica
Laportea canadensis
Parietaria pensylvanica
Pilea pumila

Valerianaceae

Valeriana pauciflora
Valerianella radiata var. radiata

Verbenaceae

Verbena urticifolia var. urticifolia

Violaceae

Hybanthus concolor
Viola missouriensis
Viola palmate var. dilatata
Viola refinesquii
Viola sagittata
Viola sororia
Viola striata

Vitaceae

Parthenocissus quinquefolia
Vitis aestivalis var. aestivalis
Vitis cinerea
Vitis riparia
Vitis vulpine

GYMNOSPERMS

Cupressaceae

Juniperus virginiana

Pinaceae

Pinus echinata

Appendix B. Invasive Species Identification and Management Information

Autumn Olive – *Elaeagnus umbellata*

Autumn olive is a woody shrub that readily invades fields, forest edges, and open woods. It is common throughout most of the Eastern and Midwestern United States. In southern Illinois, autumn olive is one of our most abundant invasive species. Autumn olive is native to China and Japan. It was first introduced into the United States in the 1830s. Since then it has been widely planted for ornamental purposes, wildlife habitat, mine reclamation, and shelterbelts. The US Fish and Wildlife Service, the Illinois Department of Natural Resources, and the Natural Resource Conservation Service (NRCS) heavily promoted and encouraged the planting and use of this species during the mid 20th century. It still is sporadically planted in Southern Illinois by landowners, but now most agencies recognize its invasive nature and ability to harm the natural environment. Autumn olive quickly spread beyond the intentional plantings.

Identification

Autumn olive can be easily identified by the by the silvery, dotted underside of the leaves. Leaves are alternate and 1 in. (2.5 cm) wide. Small, yellowish flowers are abundant and occur in clusters near the stems in May to June. Fruits are red, juicy, and edible. Fruits ripen from September to November. Autumn olive tends to be multistemmed, often branching just about ground level. Individuals usually leaf-out a week or two earlier than native shrubs and retain their leaves 2-3 weeks longer in the fall. Some individuals will have short, spiny branches, giving the plant a thorny feel.



Threat

Autumn olive most readily invades disturbed sites, but can also invade open woods and barrens. While an established tree canopy will likely restrict autumn olive to edges and canopy gaps, this species is a huge threat to trees in the regeneration stage. Because of their rapid growth rate, autumn olive can easily shade and out compete young tree seedlings and saplings. Because of this, tree plantings, fields, natural regeneration sites, and other open lands are at most risk of invasion for this species. If left unchecked, autumn olive can easily form extensive dense thickets, which are nearly impenetrable. Because the fruit, which ripen in late summer, are readily eaten by birds and small mammals, this plant has the ability to spread rapidly.

Control

Because autumn olive has large, deep root system and sprouts readily after being cut, the preferred method of control is chemical. For young autumn olive shrubs (under 4-5 feet in height) you can use one of the following methods:

- Foliar application of glyphosate or triclopyr at 2-3%* in mid-summer to early fall
- Basal bark application of triclopyr (ester formulation) at 17-25%* in oil in late summer through early winter
- Cut stump application of triclopyr (either ester or amine formulation, unless temperatures are near or below freezing, then switch to only ester formulation in oil) at 20-25% anytime after full leafout in early summer through late winter

* (always check label information for correct rates of the specific herbicide formulation you are using)

Non-chemical control methods include hand-pulling young seedlings and using a weed wrench or other leverage device to pull larger shrubs (though this often leads to the roots breaking off unless). Moist soil conditions help considerably when using this method. Prescribed fire also sets back autumn olive, though it will not likely eradicate the population.

Bush honeysuckle – *Lonicera maackii*

Bush honeysuckle is a woody shrub that invades both open and forested habitats throughout the Eastern United States. In southern Illinois, it is not yet widely prevalent, but is one of the fastest spreading invasive species in the region and, if left unchecked, will likely become very abundant quickly. Amur honeysuckle is a native of eastern Asia and was first introduced into North America in 1855. It has been planted widely as an ornamental and for wildlife food and cover, though it is not frequently used for those purposes currently.

Identification

Amur honeysuckle is a multi-stemmed, upright, deciduous shrub that grows to 15 ft. tall. The leaves are opposite, ovate, 2-3 in. long, 0.5-1.5 in. wide, pointed at the tip, and usually persist into winter. Often it is one of the first shrubs to leaf out in the spring and the last one to die back in the fall. The fragrant flowers are tubular, white to yellow in color, thin-petaled and develop in May to June. In September abundant, fleshy berries ripen to red in color and often persist into the winter. Berries are 1/4 in. in diameter. The growth form of the plant is diagnostic as it usually grows with a distinct arching habit.



Threat

Because bush honeysuckle has the ability to invade and dominate mature forested habitats without needing to be preceded by any type of disturbance, it is regarded as one of the most serious threats to natural communities in the region. Infestation can quickly form dense thickets in the understory that have the potential to completely eliminate any tree seedlings, severely reduce understory species diversity, and reduce the growth rate of overstory trees by as much as 50%. Bush honeysuckle is bird-dispersed, leading to its quick spread.

Control

Bush honeysuckle has a shallow root system, making it ideal for mechanical control for smaller specimens (if the soil moisture is high enough) and light infestations. Mechanical methods include hand-pulling seedlings and small saplings and using a weed wrench or other leverage device to pull larger shrubs. Prescribed fire also sets back autumn olive, though it will not likely eradicate the population.

Heavy infestations or large individuals will need to be controlled using chemical means, For small bush honeysuckle shrubs (under 4-5 feet in height) you can use one of the following methods:

- Foliar application of glyphosate or triclopyr at 2-3%* in mid-summer to early fall (for fall applications, make sure the foliage has not yellowed, senescing vegetation will not allow adequate herbicide uptake)
- Basal bark application of triclopyr (ester formulation) at 17-25%* in oil in late summer through early winter
- Cut stump application of triclopyr (either ester or amine formulation, unless temperatures are near or below freezing, then switch to only ester formulation in oil) at 20-25% anytime after full leafout in early summer through late winter

* (always check label information for correct rates of the specific herbicide formulation you are using)

Chinese yam – *Dioscorea oppositifolia*

Chinese yam is an herbaceous vine that invades riparian areas and other open moist habitats. It is sporadically found throughout the Eastern and Midwestern States, though more abundant in the Mid-south. In southern Illinois, Chinese yam is sparse, though it does heavily invade several watersheds, the worst of which is likely the Lusk Creek watershed. It was introduced from Asia for ornamental, food, and medicinal purposes and escaped cultivation in the late 20th century.

Identification

Chinese vines die back to the ground each winter, but resprout from the large root-like tubers. The leaves have a heart-shaped base and prominent veins and somewhat resemble greenbriar leaves. They are usually opposite, but can also be alternate or whorled. Leaves on mature vines usually have a long, pointed tip, whereas leaves on young seedlings have a more rounded tip. A useful identification characteristic is the reddish tint often found at the point where the petiole meets the leaf. The wiry vines twine from left to right (counter clock wise). In mid-summer aerials tubers (bulbils), that resemble small potatoes, are formed in the leaf axils. These tubers are the main method of reproduction for the species.



Threat

Chinese yam is most commonly found growing in rich, moist bottomland soils, but can be found in drier and poorer soils. The bulbils float and are easily transported via regular water flow and flood events. Habitats invaded include riverbanks and streamsides, ditches, moist forests, forested edges, and old homesites. Chinese yam poses a specific threat to riparian habitats. It can form high population levels and scramble over understory vegetation and low growing shrubs. While not as serious a threat as other invasive species, such as bush honeysuckle, Chinese yam can have great impacts, particularly to low, moist woodlands and riparian areas common throughout southern Illinois.

Control

The large underground tubers present on older Chinese yam specimens make eradicate difficult, often requiring several years of persistent applications. In addition, the bulbils move very quickly with waterflow, so any infestation upstream, if not controlled, will cause annual reinfestations inevitable. Cooperative, whole watershed efforts are the most effective means of eradication.

Only the young plants (seedlings) can be easily pulled by hand, but care should be taken to make sure all of the young tuber is removed otherwise the regrowth is likely. Dry soil conditions make hand-pulling extremely laborious.

Chemical application is the most effective means on controlling large infestations. Foliar applications with either glyphosate or triclopyr (amine) at 2-4%* effective. Keep in mind, that all treatments should be applied before bulbil production to prevent further spread. In southern Illinois, bulbil production usually starts in late June to early July. If work is being done over or near a stream, then only herbicides labeled for aquatic can be used.

* (always check label information for correct rates of the specific herbicide formulation you are using)

Japanese stiltgrass – *Microstegium vimineum*

Japanese stiltgrass is an annual grass that is invading forests, ditches, and roadsides. It is very widespread in the Eastern United States, particularly the Mid-South and Atlantic states. In southern Illinois, it is very widespread and continues to invade new areas, expanding its range constantly. Stiltgrass is native to Asia and was accidentally introduced into North America sometime around 1920. It has previously been used as packing material for porcelain, possibly explaining its accidental introduction.

Identification

Stiltgrass is a warm season grass, so it germinates late in the spring and flowers in late summer, and fruits/seeds generally appear in early fall. It is a weak rooted and sprawling grass that can grow to heights of 6 feet, though it is usually much shorter. Taller plants usually lay flat along the ground or propped up against other vegetation. Plants often grow in thick patches, with each individual plant usually having multiple stems. The leaves are short and wide with smooth edges and a noticeable silvery midrib on older leaves. The flowers and fruits are borne on thin, often branched spikes on the top of a delicate stem. In the fall, the tops of the plant turn purple or brown in color, giving this plant one of its other common names, browntop. In winter, the thatch is a very noticeable bright tan to orange color.



Threat

Japanese stiltgrass is widely considered one of the greatest invasive threats to forested systems in southern Illinois. Once introduced, Japanese stiltgrass can form dense stands that shade and compete with native understory flora, lowering native species diversity. It can quickly become the dominate vegetation once introduced. Stiltgrass, because of a high shade tolerance, has the potential to invade high-quality mature forests, once thought to be relatively resistant to invasion. Infestation have no value as a wildlife food. The dense thatch of older infestations can be a fire hazard and may impede tree seedling establishment. Once established, stiltgrass is very difficult to remove and spreads rapidly. The rate of spread of Japanese stiltgrass throughout Illinois in the last decade is alarming.

Control

Any effective control program for Japanese stiltgrass needs to start with spread prevention. The small seeds of stiltgrass can readily stick to the mud on boots, tire tracks, equipment, etc. Because of this, humans are often a spread vector for this species. Early detection and rapid control is necessary to prevent new infestations from starting or existing infestations to move beyond their current borders.

Similarly, Japanese stiltgrass moves via water and gravity very effectively. If additional infestations occur upstream of a site, then reinfestation is inevitable. Watershed-level collaborative projects are necessary if eradication is possible.

Because Japanese stiltgrass is weak rooted, it pulls up very easily, making mechanical control very plausible, at least for smaller infestations. Weed-whipping, torching, or low mowing can also be effective tools are preventing seed set.

Stiltgrass populations, as with any annual, survive year to year on the seed bank. Because of this, conducting all control applications before seed set (early fall in southern Illinois) is a requirement. The plants do not have to be killed, instead they need to be preventing from producing seed.

Large infestations may require chemical control, simply due to time and access constraints. Japanese stiltgrass can be treated with light rates of glyphosate (1%*) or one of the grass-specific herbicides such as Sethoxydim. If work is being done over or near a stream, then only herbicides labeled for aquatic can be used. The best time for treatment is late summer.

* (always check label information for correct rates of the specific herbicide formulation you are using)

Multiflora rose – Rosa multiflora

Multiflora rose is a deciduous woody bramble that acts like a shrub or a vine. It invades old fields, pastures, open woods, roadsides, and other disturbed areas. It is extremely widespread throughout the Midwestern and Eastern United States. In southern Illinois it is very common and present in most properties. Multiflora rose is native to Asia. It was first introduced into the United States in the 1860s. Since then it has been widely planted for wildlife habitat and as a 'living fence' for livestock. The Natural Resource Conservation Service (NRCS) and other conservation groups heavily promoted and encouraged the planting and use of this species during the mid 20th century. It is no longer being intentionally planted and is almost universally despised by landowners.

Identification

Multiflora rose is a multi-stemmed, thorny, perennial shrub that grows up to 15 ft. tall. The stems are arching canes which are round in cross section and have stiff, curved thorns. Small, white to pinkish, 5-petaled flowers occur abundantly in clusters on the plant in the spring. Fruit are small, red, rose hips that remain on the plant throughout the winter. Leaves are pinnately compound with 7-9 leaflets. Leaflets are oblong, 1-1.5 in. (2.5-3.8 cm) long and have serrated edges. The fringed petioles of multiflora rose usually distinguish it from most other rose species.



Threat

Multiflora rose has been perceived as primarily a threat to openlands, but it does have the potential to form very dense stands under canopy, particularly in moist woodlands. Disturbance is often key to facilitating an invasion. Often after ice storms, windthrows, or logging multiflora rose invades an area. Once established, the thickets of thorny bushes make utilization of the infested areas difficult if not impossible. Dense stands can also displace native species, particularly understory species that cannot compete with the deep shade to the ground layer cast by multiflora shrubs.

Control

Multiflora rose management often involves selecting areas that management is warranted. Choose sites with expanding populations, that are close to or within freshly disturbed areas, or infestations obviously impacting a desirable resource.

Because of the abundant thorns on multiflora, hand pulling is not a great option. Small seedlings or 'scraggly' individuals can be pulled easily enough given adequate soil moisture. Larger specimens could

potentially be dragged out of the ground using a chain and tractor, through this will likely lead to a thicket of root sprouts.

Smaller multiflora specimens can be controlled using a foliar application of triclopyr (or triclopyr & 2,4-D mix) applied mid-summer to early fall. The rates you would use depends upon the specific formulation of herbicide selected for treatment.

Cut stump treatments can work on individual multiflora plants of any size. Cut the stem as close to ground as possible and treat with a 20-25%* formulation of triclopyr. This method can be used anytime from mid-summer through late winter.

* (always check label information for correct rates of the specific herbicide formulation you are using)

Appendix C –Resources for Management

Invasive Species Identification and Management Information

- River to River Cooperative Weed Management Area
<http://www.rtrcwma.org>
- A Field Guide for the Identification of Invasive Plants in Southern Forests
<http://wiki.bugwood.org/Archive:IPSF>
- A Management Guide for Invasive Plants in Southern Forests
http://www.srs.fs.fed.us/pubs/gtr/gtr_srs131.pdf
- Illinois Nature Preserve Commission Vegetation Management Guidelines
http://dnr.state.il.us/inpc/management_guidelines.htm

Native Plant Identification

- Missouri Plants Website
<http://www.missouriplants.com>
- Forestryimages
www.forestryimages.org
- Illinois Native Plant Society
<http://www.ill-inps.org/>
- USFS National Wildflower Website
<http://www.fs.fed.us/wildflowers/>

Forest and Land Management

- Forest-A-Syst Program
<http://www.forestasyst.org/>
- NRCS Web Soil Survey
<http://websoilsurvey.nrcs.usda.gov/>

Equipment Suppliers

- Forestry Suppliers, Inc.
<http://www.forestry-suppliers.com/>
- Ben Meadows Company
<http://www.benmeadows.com>
- Weed Wrench Company
<http://www.weedwrench.com/weedwrench/>

- Honeysuckle popper (Shrub Buster)
<http://www.misterhoneysuckle.com/>



ILLINOIS AUDUBON SOCIETY

Helping to Preserve the Flora and Fauna of Illinois Since 1897

FOR IMMEDIATE RELEASE

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Lusk Creek Wildlife Preservation Fund Grant Completion

The Illinois Audubon Society announces its completion of a site management plan for its 57-acre parcel in the Lusk Creek Wilderness Area. Located in Pope County and surrounded by US Forest Service property, the Society permanently protected one of the last wilderness-area in holdings on Lusk Creek. Known for its rugged terrain and winding canyons, the 6,838-acre Lusk Creek Wilderness Area is within the Shawnee National Forest.

Recognizing the need for a management plan to guide stewards in protecting the site and enhancing its wilderness character, the Society applied for and received a Wildlife Preservation Fund (WPF) grant. Administered by the Illinois Department of Natural Resources, the WPF grant resulted in the creation of a comprehensive site management plan. Authored by Biologist Christopher Evans, the plan contains detailed descriptions of the natural resources found on the site and an analysis of present conditions. The plan contains management concerns for specific portions of the property and provides prioritized recommendations and implementation timelines.

As part of the grant project, several management plan priorities were implemented by the contractor and Society volunteers. Those items included invasive exotic (non-native) plant species control and removal of site debris. Additional invasive plant control treatments are planned in 2012.

From previous WPF-supported habitat and wildlife inventory projects, the Society knows more than 500 native plant species and 24 reptiles and amphibian species exist on this relatively small parcel. According to Chris Evans, the plan's author and project contractor, his goal was to develop a "realistic plan that will be used and provide guidance for the best management of this unique and fascinating parcel of land."

The Illinois Wildlife Preservation Fund Grant Program is designed to preserve, protect, perpetuate and enhance non-game wildlife and native plant resources of Illinois through preservation of a satisfactory environment and an ecological balance. Projects proposed for grant funding must focus on management, site inventories or education. The Fund is financed through a voluntary check-off designation on Illinois State income tax return forms. All donations to the fund must be used to assist non-game wildlife and native plants. The Illinois Audubon Society extends its thanks to all Illinois citizens who contribute so generously to the wildlife fund.

The Illinois Audubon Society was organized as an independent, statewide, educational and scientific organization, incorporated April 10, 1897. Our mission is to promote the perpetuation and appreciation of native flora and fauna of Illinois and the habitats that support them.