

## Final Report for Grant Agreement # 11-014W

Jo Daviess Conservation Foundation

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Reporting Period: 12/2/2010 – 9/30/2011

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The main **objectives** highlighted in the original grant request were Native American mound maintenance and native community restoration:

1.) We will follow a phased approach to maintaining these mound structures. The mounds and a minimum 10 foot radius area from the base of each mound will be restored and maintained in native vegetative cover. All trees and shrubs will be controlled on and around the mounds by cutting and stump herbicide application. Broadcast spraying of herbicides is not permitted within 10 feet of any mound. Brush clearing activities will occur when the ground is frozen.

- JDCF will use phase II and III activities on 5 mounds at Keough LWR. At Casper Bluff LWR and Wapello LWR, JDCF will use phase IV activities to maintain the mound features present there. The funds from this grant will assist JDCF in accomplishing these objectives through the use of herbicide and fire.

2.) Community restoration projects will be developed on a site specific basis. Following is a list of activities for each site:

- Keough LWR is 34.68 acres in size and contains approximately 21 acres of degraded dry-mesic oak savanna, 9.5 acres of degraded mesic upland forest, and 4 acres of riparian

wetland/open water habitat. With these funds, JDCF would be able to restore 10 acres of the natural dry-mesic oak savanna community through girdling, cutting and treating, and the use of prescribed fire.

- Wapello LWR has been restored to prairie through C2000 and SWG funds, but will need ongoing maintenance and monitoring. Through these grant funds, JDCF would be able to remove 95% of Canada thistle from 15 acres of the restored prairie.

Casper Bluff LWR contains a ¼ acre remnant hill prairie on site that will be maintained through prescribed fire and exotics control.

### **Introduction**

The Jo Daviess Conservation owns and manages properties in Jo Daviess County. Three of the properties are Land & Water Reserves and are open to the public. Keough Effigy Mounds Land & Water Reserve (Keough) was acquired and registered as a Land & Water Reserve in 2008, then opened to the public in 2010. The 35 acre site includes significant Native American archaeological features known as the Reynick Mound Group. The site is unique in that it includes the only known intact bear effigy mound within the State of Illinois. The site also includes a small portion (4.01 acres) of the Mississippi River Backwaters INAI site (#606) and a population of the state-threatened cliff goldenrod (*Solidago sciaphila*). There are two primary goals involved in the preservation of significant and notable features at this site: 1) protection of the archaeological resources and 2) protection and restoration of natural communities, including the state-threatened cliff goldenrod. A secondary goal is promoting educational and low-impact recreational activities. Casper Bluff Land & Water Reserve (Casper Bluff) is an 85 acre property purchased in 2007 that includes significant archaeological features known as the Aiken Mound Group. The site is unique in that it includes the only known intact thunderbird effigy mound within the State of Illinois. Casper Bluff was the first site within the Illinois Nature Preserve System to be protected based exclusively for its significant archaeological features (registered in 2008). There are two main goals involved in the preservation of significant and notable features at this site: 1) protection of the archaeological values and 2) protection and restoration of natural communities located on the scenic bluff including dolomite hill prairie, dry-mesic savanna and mesic upland forest. Secondary goals include: 1) promoting educational and low-impact recreational activities on the site and 2) restoring the topography of the Aiken Mounds to aid in educational interpretation of the mounds.

The 79 acre Wapello Land & Water Reserve (Wapello) was purchased in 2006 and contains the John Chapman Archaeological site as well as one-half mile of the eastern portion of the Apple River, located within the central portion of the Apple River Illinois Natural Areas Inventory Site (INAI#1647). The Apple River INAI site includes approximately 5.3 total stream miles and is recognized as a Category II site for the presence and specific suitable habitat for a state threatened mussel (*Ligumia recta*, black sandshell) and as a Category VI site for an unusual concentration of invertebrates (mussel beds supporting 18 live species of native mussels). Wapello contains the only known platform mound remaining within the Apple River Valley (Millhouse 2003b). The site is unique in that it contains a settlement of a mixing of peoples of the Terminal Late Woodland and Mississippian cultures. There are two major issues involved in the preservation of significant features at this site: 1) protection of the mussel beds and endangered and threatened mussel species within the Apple River and 2) protection of the archaeological values.

### **Materials and Methods**

We used several methods to accomplish our objectives. Brush cutting and removal on the mound features were conducted during the dormant season while the ground was frozen using chainsaws, brush cutters, loppers, and pruners. Stumps were treated with Garlon or Round Up. The mound maintenance protocol (used by the state of Wisconsin) outlined below was followed, mainly focusing on phases I, II, and III.

#### **Phase I**

Phase I involves removal of dead or down trees, trees which represent an imminent hazard to the mounds (leaning trees in danger of uprooting, storm damaged, diseased or insect infested), woody vegetation (trees and shrubs <6" DBH) and non-native invasive species. Healthy trees larger than 6" DBH remain. Material should be taken off the mounds and scattered or piled 15 feet or more from the mound wherever possible. A minimum of 15 feet should be maintained between brush piles and the mound.

#### **Phase II**

Phase II involves removal of all trees <14" DBH from the mound as well as continuing with brush removal efforts. Within 5 feet of the mound, all dead, down and hazard trees are removed.

#### **Phase III**

Phase III involves removal of all trees, healthy or not and regardless of size, from the mound and from within 15 feet of the mound.

#### **Phase IV**

Phase IV represents the long term maintenance of the site including establishment of appropriate native prairie ground cover to prevent or minimize erosion. Attempts will be made to select species of shorter stature to avoid tall vegetation which could lead to easier access for looters. Brush clearing efforts should be done at the surface only, using hand tools, and should not penetrate the soil of the mound. Broadcast herbicide use will not be permitted within 5 feet of a mound's base.

The control of invasive species was done mainly through chemical applications. Backpack sprayers were used to control invasive plants on all 3 Land & Water Reserves. The appropriate chemical and concentration was selected based on species and time of year following Illinois Nature Preserves guidelines ([http://dnr.state.il.us/INPC/Management\\_guidelines.htm](http://dnr.state.il.us/INPC/Management_guidelines.htm)). Much of the work was also done by volunteer crews using the parsnip predator and other hand tools. Following chemical control and plant removal, crews would go back in later in the season to remove seed heads before dispersal and burn them off site.

Prescribed fire was used to restore native vegetation and to control woody growth on mound features. It was also used to restore native vegetation in prairie and woodland units and prepare ground for restoration. Volunteer crews assisted the burn boss with prescribed fires. Fire was also used during the growing season with propane torch. It was used to control garlic mustard and was also used to burn brush piles.

#### **Results**

Keough received a woodland burn in the fall of 2010 on 5 acres of the dry-mesic savanna and dolomite cliff area to promote growth of native vegetation, in particular oaks, and control non-native plants. In the spring of 2011, volunteer crews pulled garlic mustard, multiflora rose, and Canada thistle in that 5 acre unit and an additional 5 acres of the dry mesic savanna. JDCF staff also sprayed garlic mustard rosettes prior to native vegetation growth. Several garbage bags of garlic mustard were removed from the site and burned. During the winter of 2011, the mound units at Keough were cleared of brush and woody growth following phases II and III of the mound maintenance protocol.



Linear mound following brush/tree removal- 2011(Keough Effigy Mounds LWR)



Burn unit following fall burn – 2010 (Keough Effigy Mounds LWR)

Casper Bluff received a spring burn in 2011 totaling 38 acres. Following the burn, steep slopes and areas of pasture grass were interseeded with local seed. As garlic mustard and Canada thistle came up they were pulled or dug by volunteers. Later in the season, herbicide was used to control garlic mustard, Canada thistle, multiflora rose, and wild parsnip. The propane torch was also used to kill garlic mustard plants in the season.



Casper Bluff LWR during spring burn – 2011



Photo of “Thunderbird Effigy” mound at Casper Bluff LWR



Photo of prairie restoration unit at Casper Bluff – seeded in fall 2009.

Wapello received a prescribed burn in the spring of 2011 on 17 acres of restored prairie. The burn was executed with a volunteer burn crew under the guidance of the burn boss. Following the burn, certain areas that were sparse or had cool season grasses were interseeded with seed collected from the site the previous fall. Canada thistle, wild parsnip, and poison hemlock were then removed with parsnip predators as it came up following the burn by volunteer crews. Herbicide was used throughout the year to control garlic mustard, Canada thistle, poison hemlock, reed canary grass, and Japanese Hops. Canada thistle control efforts were focused on 15 acres of the restored prairie unit. The thistle counts throughout the season showed a 75% reduction in thistle population in the focus area, but many of those that were left had the seed heads removed, so removal of seed from the area equaled 95%.



Volunteers and JDCF staff interseeding following spring 2011 burn (Wapello LWR)



Volunteers removing parsnip and Canada thistle following spring burn (Wapello LWR)



Wapello LWR in full bloom – summer 2011



Wapello LWR – 2011

## **Discussion**

Our work on these 3 Land & Water Reserves involves many volunteers and partner organizations. Grant funds were used to accomplish primary and secondary objectives on JDCF Land & Water Reserves. The JDCF was awarded the Illinois Youth Recreation Corps grant from the Illinois Department of Natural Resources. This grant allowed us to hire 3 youth workers who could work on our 3 Land & Water Reserves and provided extensive match to the Illinois Wildlife Preservation Fund grant. The cost of the propane torch and the herbicide was lower than expected, which enabled the purchase of other pieces of burn equipment and chainsaw parts/repairs. These purchases allowed additional work on firebreaks and mound clearing. Several of the mound features at Keough were cleared of brush and trees following the mound management protocol. The trail was also moved further from the mound features to protect them from compaction and erosion. The fall burn in 2010 at Keough in the savanna area has helped to restore native vegetation. Volunteers and staff were able to treat or remove invasive plants in this area and will continue to do so in the future. This is important habitat for the cliff goldenrod, as well as many other wildlife species, including the pileated woodpecker, red-headed woodpecker, brown creeper, and ovenbird, as well as many other forest/savanna species.

Natural community restoration also took place at Casper Bluff. Volunteer crews, Illinois Youth Recreation workers, and JDCF staff worked to maintain fire breaks, prepare an area for prairie restoration, and remove invasive plants from the prairie remnant and other restored areas on site. There is a population of bobolinks at Casper Bluff that will benefit from our efforts to maintain grassland habitat at Casper Bluff. Red-headed and pileated woodpeckers will benefit from the presence of savanna habitat at Casper Bluff. Due to the proximity to the river, the site is also used by sandhill cranes, eagles, and soras.

The prairie restoration at Wapello contains over 80 species of native grasses and forbs and the active friends group associated with the property has helped to maintain that prairie through seed collection, invasive plant control, and prescribed fire. Many grassland species will benefit from the presence of native prairie. Recently, henslow's sparrows, sedge wrens, savanna sparrows, and bobolinks have begun utilizing and breeding on the site. The reduction of erosion by having prairie along the Apple River will benefit the endangered and threatened mussel species that utilize that stretch of river and the other aquatic life, which will also benefit the bald eagles that use the Apple River.



Vendor names, addresses, list and day of items purchased.

<u>Vendor</u>	<u>Address</u>	<u>Item purchased</u>	<u>Quantity purchased</u>	<u>Date purchased</u>
Flame Engineering, Inc.	P.O. Box 577, West Highway 4, LaCrosse, KS 67548	Back pack squeeze valve w/ c-11 cylinder	1	12/27/2010
Flame Engineering, Inc.	P.O. Box 577, West Highway 4, LaCrosse, KS 67548	LPG cylinder	1	12/27/2010
Ben Meadows	PO Box 5277 Janesville WI USA 53547-5277	Drip Torch Red	1	12/23/2010
Ben Meadows	PO Box 5277 Janesville WI USA 53547-5277	Wind Meter DGTL Kestrel 3000	1	12/23/2010
Ben Meadows	PO Box 5277 Janesville WI USA 53547-5277	Fire Helmet	1	12/23/2010
Stephenson Service Company	P.O. Box 917, Freeport, IL 61032	LP Gas bottled	24	1/4/2011
Galena Auto Parts	1013 Spring St., Galena, IL 61036	Chainsaw oils/lubricants		1/24/2011
Galena Auto Parts	1013 Spring St., Galena, IL 61036	Chainsaw parts/repairs		2/17/2011
Galena Auto Parts	1013 Spring St., Galena, IL 61036	Chainsaw parts/repairs		1/24/2011
Galena Auto Parts	1013 Spring St., Galena, IL 61036	Chainsaw helmet	1	3/16/2011
Quality Equipment & Spray	2016 W. North Lane, Phoenix, AZ 85021	sprayer parts		1/24/2011
Stephenson Service Company	P.O. Box 917, Freeport, IL 61032	Herbicide		5/18/2011

<b>DETAILED BUDGET</b>			
<b>EQUIPMENT</b>			
Description	Price/Item	Quantity	Total
Backpack flame torch kit and cylinders for exotics control	\$302.00	1	\$302.00
LP Gas bottled for flame torch kit	\$0.7975/lb.	24	\$19.14
Fire weather instrument kit for prescribed fire	\$154.00	1	\$154.00
Drip Torch	\$139.00	1	\$139.00
Prescribed Fire Helmet	\$206.00	1	\$206.00
<b>MATERIALS/SUPPLIES</b>			
Description	Price/Item	Quantity	Total
Glyphosate (Glyphos)	\$14.85/gallon	12.5	\$185.63
Glyphosate (Aquastar)	\$24.50/gallon	10	\$245.00
Triclopyr (Element 4)	\$89.98/gallon	2.5	\$214.88
Crop Oil + surfactant	\$12.35/gallon	5	\$61.75
Chainsaw helmet	\$68.96	1	\$68.96
Herbicide sprayer part	\$30.74	1	\$30.74
<b>OTHER</b>			
Description			Total
Chainsaw parts/repairs			\$172.78
Oils/lubricants for chain saws			\$99.70
<b>TOTAL COST OF PROJECT</b>			\$1899.58

**BUDGET SUMMARY**

<b>Budget Summary/Category</b>	<b>Project Total</b>	<b>Grant Funds Expended</b>	<b>Cost Share</b>
Personnel (JDCE)	\$1360.00		\$1360.00
Travel			
Equipment	\$889.10	\$889.10	
Materials/Supplies/Other	\$1010.48	\$1010.48	
Contractual Services			
Other (volunteer hours)	\$2165.00		\$2165.00
Matching grant (Illinois Youth Recreation Corps)	\$1275.00		\$1275.00
<b>Total</b>	<b>\$ 6699.58</b>	<b>\$1899.58</b>	<b>\$ 4800.00</b>

**Staff/Volunteer/Grant Matching Hours**

<b>Source of Cost Share Funds:</b>	<b>Casper Bluff LWR</b>	<b>Wapello LWR</b>	<b>Keough Effigy Mounds LWR</b>
Jo Daviess Conservation Foundation staff time @ \$20.00/hr.	24	24	20
Other (volunteer hours) @ \$10.00/hr.	99	97	20.5
Matching grant (Illinois Youth Recreation Corps) @8.50/hr.	125	25	