2008 Terrell Grant Summary:

Replacement of exotic plants and grassland restoration for birds in Georgia's Piedmont and upper Coastal Plain

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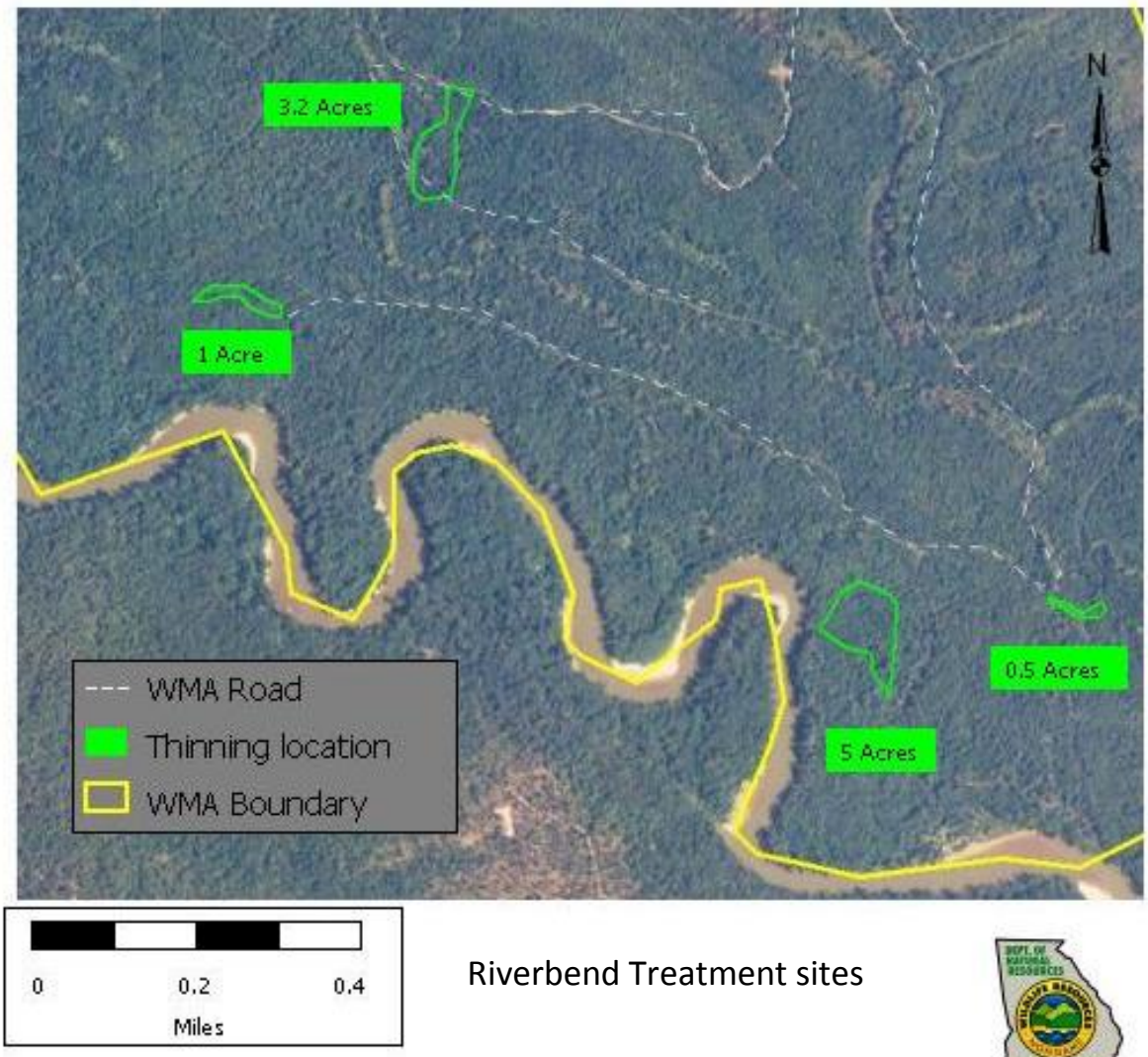
Introduction: This grant was designed to address the declines in suitable habitat for grassland birds, both upland (native warm season grasses) and bottomland (canebrakes). In both habitats, invasive exotic plants have become a significant problem with exotic pasture grasses out-competing native warm season grasses in the uplands and Chinese privet (*Ligustrum sinense*) outcompeting native cane (Arundinaria sp) in the bottomlands. This project uses herbicide and physical removal to clear habitats of non-native species, and then plants, or transplants native grasses to replace them.

Canebrake Restoration Expenditures:

Item	GOS expense	DNR expense
Panola Mulching '08	**$13,500.00**	
Riverbend Mulching '08	**$6,861.00**	
Tim Keyes Staff Time		**$4,147.48**
State Park Volunteer hours		**$12,580.00**
TOTAL	**$20,361.00**	**$12,727.48**

Canebrake Work Summary: Canebrake restoration work was completed at two sites, Panola Mountain State Park and Riverbend WMA. While Swainson's Warbler were not documented at Panola Mountain, there was potential for them there with habitat management (privet removal and cane transplant). Natural cane stands at Panola were limited to the immediate river edge and levee where lateral light allowed for cane growth. Inland from the natural levee, a dense young canopy of box elder and privet excluded cane almost entirely. Riverbend WMA has an existing population of Swainson's Warblers due to a dense young forest structure. As this forest canopy ages, the habitat will become less suitable for Swainson's warbler and other species that use canebrakes. Dense stands of privet and China berry hindered the natural growth of cane, though cane existed in scattered stands throughout.

Riverbend WMA:



Riverbend Treatment sites

Work Summary

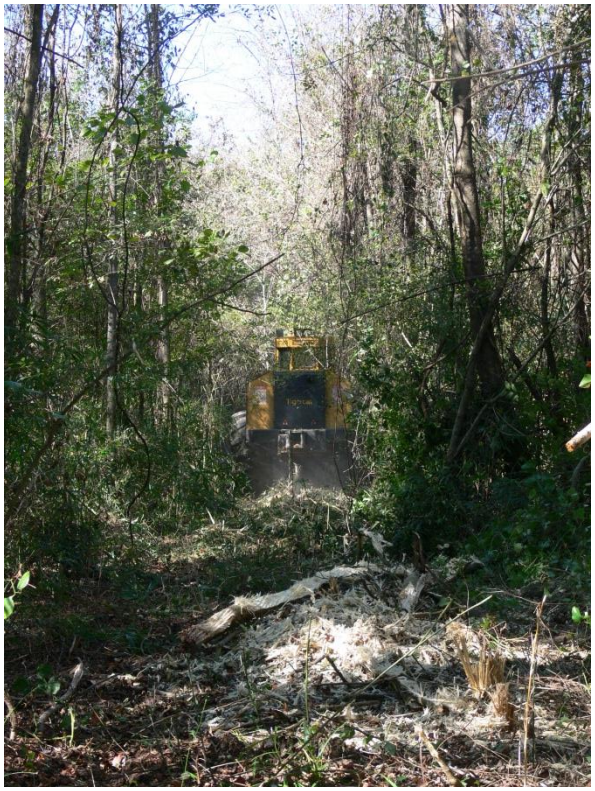
Date	Activity
10/17/2008	Marked treatment boundaries
10/20/2008	Mechanical mulching
5/20/2009	Hack and Squirt (Glyphosate) adjacent to mulched areas
6/5/2009	Velpar treatment (4ml./squirt) on a 4'X4' grid
6/9/2009	Velpar treatment (4ml./squirt) on a 4'X4' grid
7/2013	Revisit 5 acre patch

Two sites at Riverbend were accessible by skidder, and we had the 0.5 acre and 5.0 acre sites mulched with a wheeled skidder with an 8' mulching head in the fall of 2008. This altered the site from a thicket

of privet and chinaberry with scattered cane, to essentially an open stand (see photos). Stumps were spot treated with herbicide in order to limit stump sprouting. This site was revisited in the summer of 2009, and it was determined that there was no need for further spot treatment of invasives, as the cane was coming back vigorously in sites that had been mulched. By the mid-summer of 2009 there were new cane shoots over 4' tall. The two patches with Velpar treatment were not as effective as the mulched and Hack and Squirt treatments. This may have been a result of application too late in the summer of 2009.

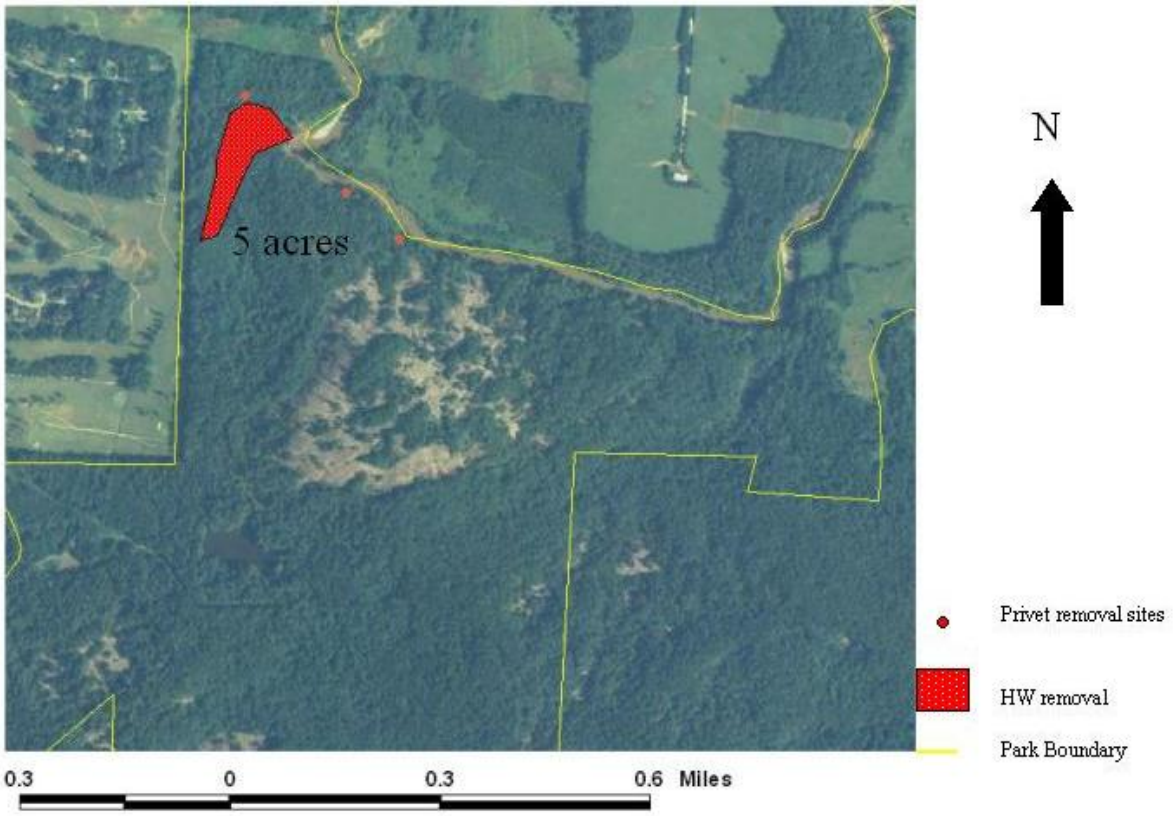
The 5 acre treatment site was visited in the summer of 2013 and had developed into an impenetrable thicket of cane and smilax. While it was too late in the season to survey for Swainson's Warbler, the habitat looked suitable for them.

Photo points were established to track the progression of regrowth, and we hope to revisit them this calendar year to assess the progress of the treatment.



Skidder with mulching head. Pre and post treatment.

Panola MT State Park:



Date	Activity
4/20/2008	mechanical mulching of cane restoration site
4/26/2008	Volunteer day, transplanted cane into 3 patches. Low survival – perhaps due to hi drought index (KBDI). Brought water tank and pump to water all transplanted cane.
7/16/2008	Girdled and cut privet and box elder (sprayed cuts with Garlon Glyphosate mix). Noted natural sprouting of cane in areas where privet was removed. *Erectites* sp grown high rapidly (died down by winter of 2009)
1/19/2009	second work day at Panola – transplanted into 7 discrete patches north of dead box elders, each patch approximately 10 clumps 10-15' apart. Much lower drought index (KBDI) than first transplant
1/22/2009	returned – counted stems in both 1YR transplant plots and recent transplant plot – staked some that were falling
7/17/2009	30% transplanted cane surviving – Privet treated with injector not dying. Some good cane regrowth adjacent to existing cane patches some up to 8' tall and 20' back from original patch. Regrowth best in most open areas. Growing through dense *microstegium* patches.

One site was treated the week of April 20th 2008 at Panola Mountain State Park. It was a 5 acre floodplain of a small tributary to the yellow river just upstream from the mountain (see map). In addition, the narrow strip of floodplain along the Yellow River downstream was also treated. The understory was primarily privet with an overstory of Box Elder. The privet was mulched with a skid-steer with a 6' mulching head. It was able to remove the entire understory. Patches of natural cane were largely confined to the immediate river bank and levee, where enough lateral light penetrated the forest to allow for cane to thrive.

On April 26th 2008 State Parks staff helped to organize a volunteer day at the park, where we had 16 volunteers as well as 5 nongame staff and several parks staff transplant roughly 90 clumps of native cane from along the immediate river bank to the recently cleared area. They were arranged in three areas where maximum light was hitting the forest floor. All transplanted cane was watered with a water tank we brought to the site.

By the summer of 2008 it was clear that there was still a significant canopy of box elder, so a large number of these trees were girdled and herbicided with Garlon 4 and oil surfactant. Transplanted cane was checked and survival was found to be about 50%. The high mortality rate may have been due to drought conditions during the transplanting (despite watering all stems). Short cane stems had higher survival than tall cane stems. This likely was a result of the fact that the taller stems were transplanted from the sandy levee, so it was difficult to maintain an intact root ball. The smaller stems of cane were off the river further in finer soils which maintained better root balls.

A second work day was organized on 1/19/2009. We were hoping for mechanized assistance, but the State Park's tractor and auger both broke, but we were able to bring a mule back to the transplant area which made transport far easier. We manually transplanted 70 clumps of cane in 10 patches about 10-15 feet apart. We located these patches in the openings generated by the box elder girdling. The drought index (KBDI) was much lower during the second transplanting and survival was much higher. Some larger stems of cane were staked upright with rebar on 1/22/2009 as several had fallen over.

Subsequent work that was not funded by this grant included the experimental planting of cane plugs in the cleared areas away from the river, and follow-up spot herbicide treatment by State Parks staff.

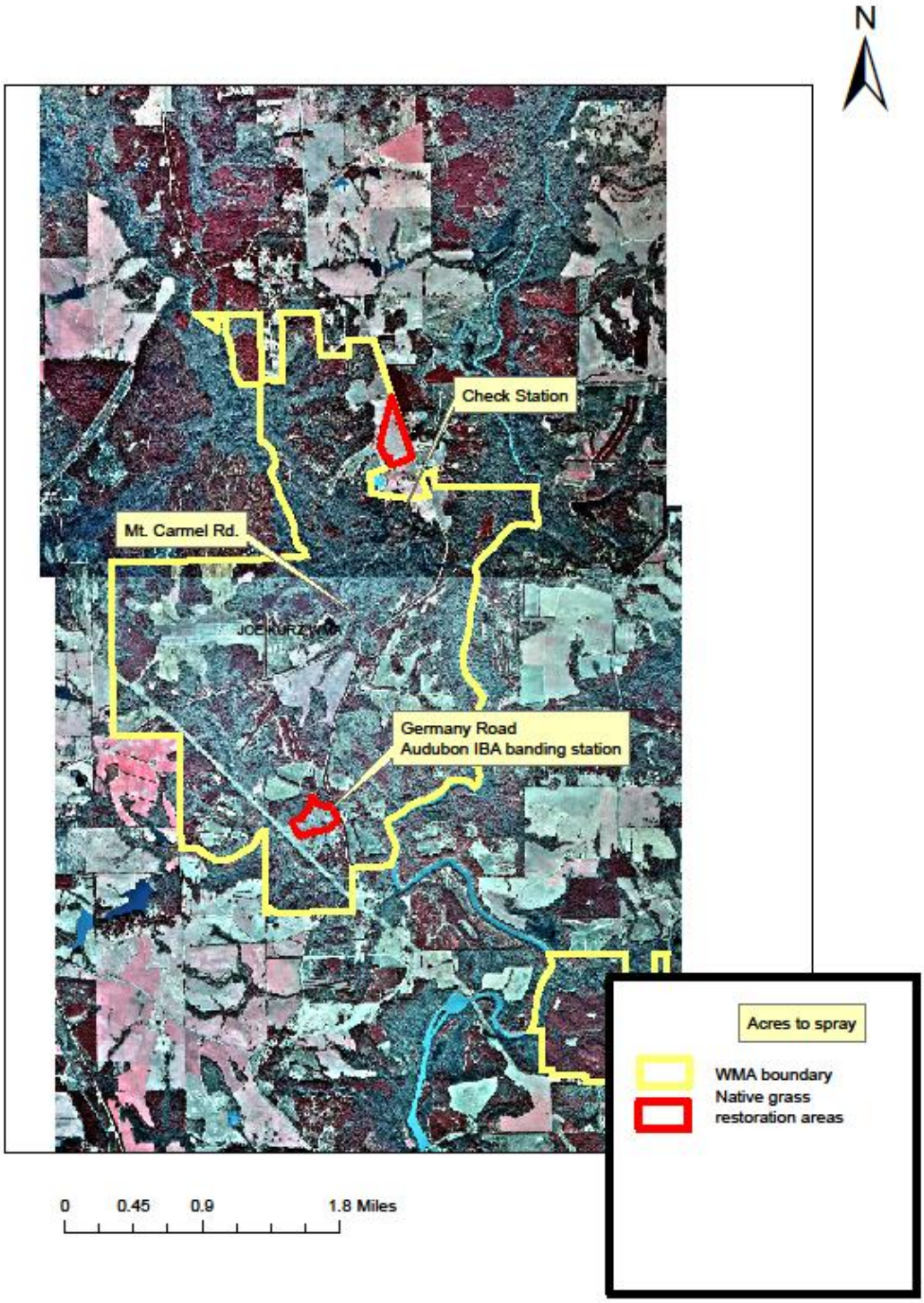
Native Warm Season Grass Work Summary

Fifty six acres were of exotic pasture grasses were converted to native warm season grasses on Joe Kurz WMA in 2008-2009 (see attached map). Grasses were sprayed in the fall of 2008 with imazapyr at a rate of 64 oz/acre. The following spring remaining weeds were sprayed with 2 qts/acre of glyphosate. The thatch was burned off within two weeks and the site was immediate planted to switchgrass, indiangrass, and little bluestem purchased from Roundstone seed in Kentucky.

Date	Item	Price	Who or where?
5/30/2008	Helena Chemical (herbicide)	$1,127	Joe Kurz and Panola
5/29/08	Roundstone Seed	$3,984	Joe Kurz WMA
12/16/08	Fuel stipend for regular banding volunteers	$50	Anne Armstrong
12/16/08	Fuel stipend for regular banding volunteers	$50	Bill Boyd
12/16/08	Fuel stipend for regular banding volunteers	$50	Terry Valentine
12/16/08	Fuel stipend for regular banding volunteers	$350	Ashley Harrington
09/30/08	Contract to run MAPS banding station	$1,000	Charlie Muise
Total		$6,611	

Figure 1. This frosty morning photo was taken by a banding station volunteer in the area near the MAPS station. GOS funds were used to establish this stand of grasses where a number of high conservation priority grassland birds have been banded.

Figure 2. Two sites totaling 56 acres were converted to native warm season grasses on Joe Kurz WMA between 2008 and 2009.



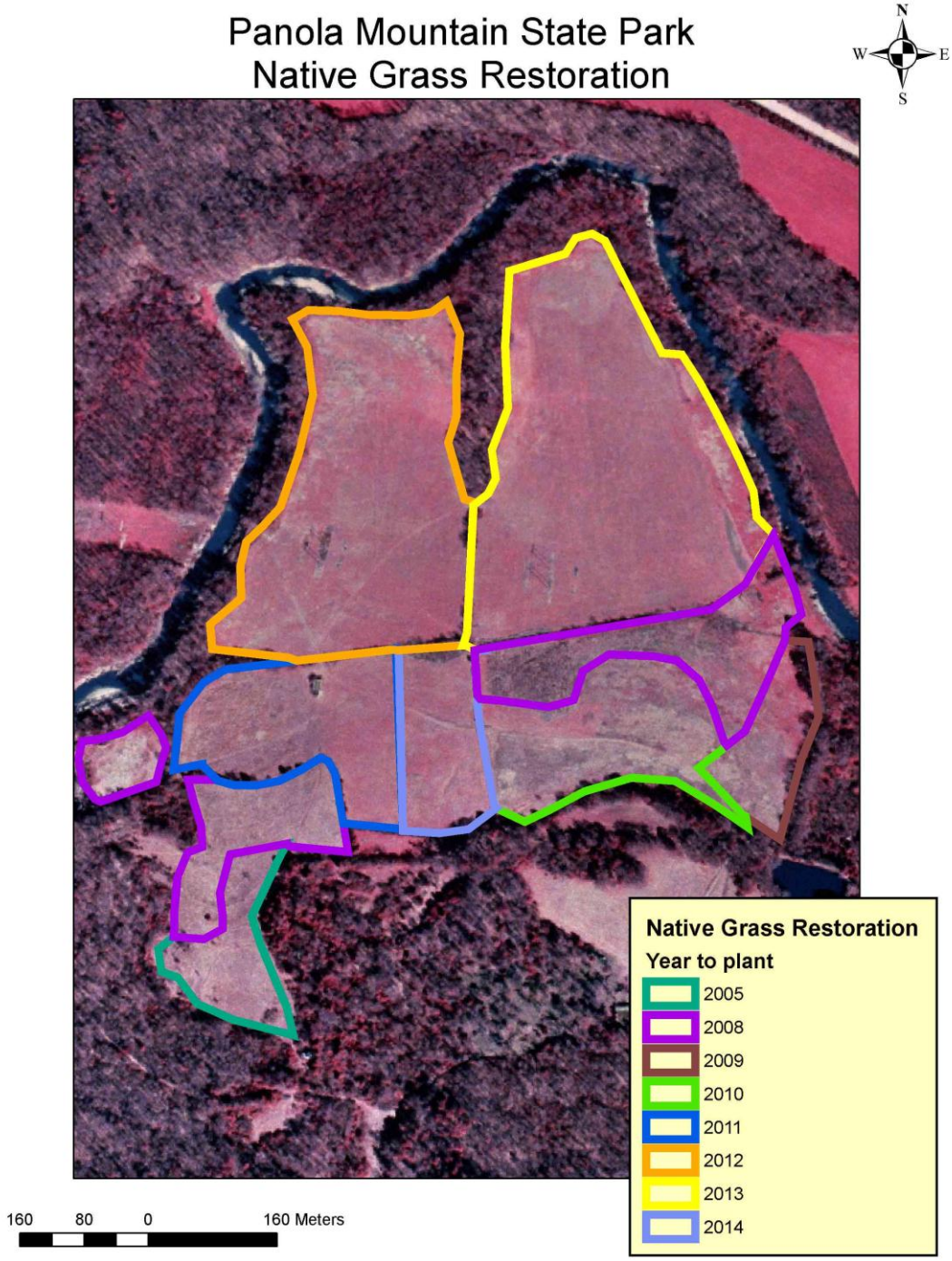
On Panola Mountain State Park 5 acres were converted 2008, 4 acres were converted in 2009 and an additional 9 acres were prepared for conversion in 2009. An identical approach was used on Panola to prepare the seedbed with a fall application of imazapyr and a spring application of glyphosate. Due to air quality restrictions burns were not allowed during the planting season so instead the planting area was burned in the winter, then disked prior to seeding, then a cultipacker was used to ensure good seed to soil contact.

Four work days were held during this time where volunteers hand collected grass seed from already restored areas for future plantings. About 84 lbs of seed was collected by 60 volunteers. This seed has since been used in later plantings. To date (March 2014) 43 acres have been restored and an additional 25 acres are prepared for planting in spring of 2014.

Work on Panola Mountain State Park was generally much slower going than elsewhere due to a lack of equipment in the early years. Most herbicide applications were by backpack sprayer and grass seed was hand collected. This led to the request for a substantial portion of the 2008 GOS funds to go toward the purchase of a tractor for the Nongame Conservation Section (see Apppendix A to the 2008-2009 award), which was approved by the grant committee in 2011.

Figure 4. Exotic pasture grasses being burned off in preparation for planting on Panola Mountain State Park.

Figure 4. Map of NWSG restoration work on Panola Mountain State Park. About 9 acres were converted in 2008-2009 using GOS funds. An additional 9 acres received herbicide treatments in 2009 in preparation for planting in 2010.



2010.

Figure 5. A work day in 2013 brought in over 130 people to assist introducing forbs for butterfly and bird diversity in this restoration area planted in 2009 using GOS funding. Participants learned about native grasses, grassland birds, grassland plants and the role of GOS in funding restoration efforts. Three boyscout troops were included in the activity day.

Divergences:

- The original amount of this grant was $90,800.00. After being awarded, the amount was reduced to $50,000. (I believe due to principal value loss in the Terrell Grant Fund).
- In the summer of 2009, the lead on the cane component of this grant (Tim Keyes) took another position and moved to the coast. Unfortunately this meant that since 2009 there has been limited ability to monitor vegetative or bird response at Riverbend and Panola canebrake restoration plots.
- Funds required for NWSG conversion at Joe Kurz and Panola were less than expected (Parks covered herbicide costs and we hand collected seed from on site for Panola, game management covered a portion of the herbicide costs for Joe Kurz WMA). A

substantial portion of the remaining funds from the 2008 and 2009 awards were redirected (with GOS grant committee approval) toward the purchase of a tractor to allow more of this work to be done in house. (See appendix A to the 2008-2009 award).