

EVALUATION OF TWO USDA GOVERNMENT CONTRACTS ON A
FAMILY FARM IN SOUTHERN INDIANA

A CREATIVE PROJECT

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Chapter 1- Introduction

The purpose of this creative project is to evaluate two United States Department of Agriculture (USDA) private landowner wildlife conservation contracts. Both contracts have been implemented on my Grandparent's farm in southern Indiana, Switzerland County. The goal of both contracts is to increase wildlife on my family's farm, specifically to create primary habitat conditions for bobwhite quail by manipulating the landscape (e.g., planting plants that offer food and cover for quail). Aside from my interest in increasing bobwhite quail numbers on the farm, I am also interested in examining other wildlife populations like deer and turkey. Further, I wanted to evaluate the success of the conservation practices implemented on the farm over the last few years since the initial start of the work in 2007.

Will changing the land use from what it was in the past to what it is today increase general wildlife abundance? More importantly was the time and money that I, the US government, and my family put into completing these practices worth the effort as it relates to wildlife and land use on my family's farm? The project not only sets out to answer these questions, but it also provides a very real account of the kinds of decisions, hardships, and opportunities that are a consistent part of owning and managing land sustainably as a family.

1.1 Government Conservation Contracts

Both contracts implemented on my family's farm are United States Department of Agricultural (USDA) contracts with the first one being a Wildlife Habitat Incentive Program (WHIP) and the other being a Conservation Practice (CP 33), also called "Habitat Buffers for Upland Birds (see Figure 1).



Figure 1. Family farm with location of wildlife enhancement projects. Source: Google Earth 2011

Both contracts are managed by the USDA, but are funded by two different agencies. WHIP is funded by the Natural Resources Conservation Service (NRCS) and the CP 33 contract is funded by the Farm Service Agency (FSA). For both the WHIP and CP 33, a habitat development plans(which details the steps and layout of certain land management practices to improve wildlife quality on the farm) was developed by an Indiana Department of Natural Resources Division of Fish and Wildlife District Wildlife Biologist and NRCS representative covering the county were the farm is located.

1.2 Background

Switzerland County is in the southeastern part of Indiana. The Ohio River borders the county on the south and east, with the northern part of the county containing more agricultural fields and a flatter topography compared to the southern half of the county, which becomes increasingly forested and hillier as you get closer to the Ohio River.

The 60 acre farm has 20 tillable acres and 40 acres of pasture with wooded areas present. A stream runs through the pasture, which is sloping with some hillsides and ridges. Cattle were kept in the pasture for more than 50 years. They were removed from the pasture about 10 years ago.

The pasture was dominated with non-friendly wildlife grass mainly fescue, (a cool season grass which forms dense stands of sod) with little value to wildlife for cover and other aspect of their life shown in figure 2.



Figure 2. Before planting Warm Season Grass in the spring of 2007. Source: Author



Figure 3. After Warm Season Grass was planted and fescue was controlled in 2012.

Source : Author

The pasture was continually grazed with no rotation of cattle to different areas of the pasture, allowing for the recovery of vegetation. The grass was always short with very little cover for wildlife. Mowing was done once a year to control woody brush. After the cattle were removed from the pasture, the mowing stopped and grass gave way to brush and tree saplings. The dominant brush was multiflora rose in many parts of the pasture. Before the Fall of 2006 many parts of the pasture were impossible to navigate, because the multiflora rose dominated the landscape. Multiflora rose was finally controlled after my Dad and I mowed and sprayed with herbicide in the Fall of 2006.

1.3 Family Considerations

Since 2005, when my grandparents passed away, ownership of the farm passed to their three children my mother, aunt, and uncle. Each of the three heirs controls 1/3 of the property. It was important that I receive permission from my family to move forward with implementing these land management practices. In order to get both contracts signed by other family members it required some salesmanship on my part, along with educating each family member about the contracts and what is involved in implementing them. My family was skeptical about several things relating to the contracts. For example, they questioned why it needed to be done, who will do the work, and how much will these contracts cost the farm or each family member involved? The main reason for resistance by some family members had nothing to do with potential changes on the farm that my family was proposing. But was more related to protecting their part of the farm or

financial asset, since both my aunt and uncle do not understand what the conservation practices involve or the reason for doing them. Further, they have other interests besides implementing change on the family farm to benefit wildlife. My parents and I are the only family members that have any interest in keeping the farm in the near future. That is why my Dad and I wanted to implement this change and sign these two USDA contracts on the farm. After explaining to some members of my family that my immediate family would take care of all the work and planning involved with these two contracts and there would be no cost to the farm the rest of my agreed with my immediate family to sign the USDA contracts. The \$9,000 (cost for the work) would be subsidized by the government, specifically Natural Resources Conservation Service (NRCS) and the Farm Service Agency (FSA). When my family agreed to allow the work to take place, both contracts were signed in the Summer of 2006 and work began that following year.

The objectives of this project are to: (1) describe previous conditions of the family farm; (2) describe the land use amendments recommended by both WHIP and CP 33 conservation programs and implemented by myself and my father; and (3) report on observed changes in wildlife abundance, specifically bobwhite quail based on the management recommendations.

Chapter 2- Literature Review

The past century has witnessed dramatic change in farming landscapes. With increases in field sizes, traditional edge habitats of brush, forbs (herbaceous plant other than a grass or sedge) and non planted vegetation have been significantly reduced in the range of northern bobwhite quail and songbirds (Quail-Friendly Plants of the Midwest, 2008). Field sizes have increased throughout central North America. With the trend toward larger field size, there is increasing size of farm equipment and the specialization of growing one or few commodities like corn and soybeans (Best et al, 1990). This type of habitat is important for many types of wildlife like quail, and many other songbirds found on farmlands because it keeps them on the farm to breed, forage, loaf, and escape predators. Quail were once abundant across southern Indiana with peak populations occurring in the late 1960s and early 1970s (Indiana Division of Fish and Wildlife, 2007).

Quail population numbers have declined every year since early 1970s in Indiana along with the whole geographic range which covers the eastern United States (USDA-FSA, 2005). This decline in bobwhite quail population numbers has occurred over the past three decades across its range (Brennan, 1991). Among the most influential impacts reducing northern bobwhite numbers continues to be the loss of nesting areas and protective cover (USDA-NRCS, 1999). Williams (2004) suggested that conservation efforts should be focused on areas where populations of bobwhite quail are already present and where habitat improvements are possible. The loss of biodiversity in agricultural communities has been happening for several decades with the hope that set-aside land can halt or improve biodiversity in the farmland setting (Donald et al, 2001).

Landscapes that contain relatively large tracts of set-aside land contain more diverse plant communities and animal taxa. So farmers should be encouraged at a regional level to enroll parcels that are relatively large, because large set-aside areas contain greater number of species of all taxa (Buskirk and Willi, 2004). The USDA has recognized that production agriculture, in all of its forms (e.g., animal production and commodity crops) has resulted in the loss of habitat and species diversity. In response to these losses, the USDA and several other government agencies (e.g., NRCS) have developed a number of land management practices designed to increase habitat and species diversity. WHIP and CP33 are two such programs.

2.1 WHIP

The Wildlife Habitat Incentive Program (WHIP) started by the Natural Resource Conservation Service in 1998, is a voluntary program that encourages creation of high quality wildlife habitat on private lands. Several studies show a positive effect on wildlife abundance when conservation practices are put into place through government programs like WHIP and Conservation Reserve Program (CRP) to develop set-aside land with early successional habitat (Harper 2007; Stauffer 1989).

Researchers have found that species abundance of wildlife including insects, spiders and plants were significantly higher on set-aside land than on nearby control areas under conventional agriculture (Buskirk, 2004). And King (1991) found higher species richness in CRP ground for quail and songbirds in Nebraska. CRP fields in the Midwest

supported much higher population numbers of songbirds and bobwhite quail during winter compared to fields without a CRP practice in place (Best et al, 1997). However with all the benefits set-aside land can provide for wildlife, there can be some negative aspects as well. Yahner, (1988) found that wildlife near edges created by buffers or fields had increased predator abundance when compared to fields with no created edge. Also these linear habitats along with field edges can increase nest predators like raccoons and skunks where nesting birds are present like bobwhite quail and songbirds (Crabtree et al, 1989).

Implementing WHIP on private land requires that the habitat development be done by the landowner. A wildlife plan, developed by the State Wildlife Biologist and NRCS provides technical assistance. This plan provides a 75% cost-share for each conservation practice enrolled in the WHIP program and represents a 10 year agreement. The cost-share covers everything. Implementing WHIP on private land requires that the habitat development be done by the landowner. The cost-share covers everything outlined in the plan from the initial work to the work conducted in the middle of the contract after all the conservation practices are completed. Some examples of practices funded by the WHIP program on private land could include tree planting, native warm season grass planting, wetland development or enhancement, and upland wildlife habitat management for species like bobwhite quail and songbirds.

2.2 CP 33

The CP33 Program began in 2004 and is one of many conservation reserve program funded by the Farm Service Agency (FSA) throughout the United States. The

overall goal of the program is to increase populations of bobwhite quail throughout its traditional range, by increasing habitat acres. This program covers 34 states in the bobwhite quail range with 250,000 acres available to landowners with landowners in Indiana receiving 20,000 acres to improve quail habitat on existing, farmed cropland.

The CP33 program is not a total field retirement like other conservation practices controlled by the Farm Service Agency. Instead, CP33 requires landowners to establish a strip of vegetation or buffer around the perimeter of the crop field allowing the remaining part of the field to be farmed as usually. Farm fields with buffers are increasingly associated with high bobwhite densities (Roseberry and Sadkamp, 1998). A narrow buffer (<3m wide) in an agriculture-dominated landscape in North Carolina nearly doubled quail numbers the summer after establishment (Riddle, 2007).

The buffer width under the CP 33 contract can be between 30 and 120 feet wide from the edge of the crop field. In agriculture-dominated landscapes, landowners and farmers have a greater flexibility because narrow, linear and nonlinear upland habitat buffers can increase bobwhite populations (Shalaway, 1985). However wide and nonlinear field borders provide the greatest population response of bobwhite quail if kept in the early successional stage (Conover et al, 2007; Riddle et al, 2008). This buffer can be allowed to regrow into natural cover through natural succession, or can be planted with a mixture of Warm Season Grasses (WSG) with some shrub planting allowed on part of the acreage as well. For this FSA contract there is a 90% cost- share on all initial work done with additional payments based on the type of management done during the

mid-contract part of the contract. The management is usually done during the 3rd to 4th year of the CP33 contract which lasts 10 years.

Mid-contract options are very important tools for land managers. Examples of mid-contract management are prescribed burning, disking areas of the field (i.e., strip disking), inter-seeding of forbs (any broadleaved plant), or strip spraying with herbicide. All these practice are done to increase plant diversity and reduce the WSG dominance along with plant succession after several years into the CP33 contract or WHIP contract. These types of mid-contract disturbances benefit upland birds, including quail which are early successional species (Greenfield et al, 2002). Along with initial cost-share payments there are two other one-time signing payments. One from the FSA and the other from the state where the land is located. In addition, there is, a yearly soil rental payment determined by type of soil in area that is to be paid every year of the contract.

2.3 Family Planning for Farm

Any family farm no matter how small or how big is a business and contains many aspects that must be addressed by all family members in order for the farm to function. The family farm is a complex entity that is tied together in a unique relationship composed of a great variety of expensive physical facilities and carries on a variety of production activities on a farm setting (Keefe and Burk, 1967). And the decision on my Grandparent's farm to enroll into these two USDA contracts required clarification on some issues for the whole family to agree and sign the contracts. With my aunt having the toughest time understanding why my immediate family wanted to implement this type of change on the farm for wildlife and change the looks of the farm. Some of my aunt's

reaction to this change on the farm can maybe be explained by the findings of (Baden and Mattheis, 1994), which pointed out that the daughter-in-law is probably the most stressed family member in a farm family.

The daughter-in-law is the key to the success of the intergenerational family business along with the relationships with extended family members. Since the daughter-in-law is tied to both the extended family along with the farm family business system providing added stress unlike other family members (Baden and Mattheis, 1994). With our case, some of the same aspects discussed relate very closely to our family since my aunt's decision influenced my uncle and without my whole family in agreement the contracts would not be signed and no change of the land would be done.

Farms are places of residence, and land often has symbolic importance that exceeds its economic value in many societies (Mishra et al, 2010). My immediate family were the only family members who thought it was important to change the landscape for the benefit of wildlife. Further, we were the only ones who were willing to do the work involved. The rest of my family had very different life experiences growing up and had different interest and hobbies aside from conservation and wildlife conservation on the farm.

On the farm personal variables differentiate individuals according to their unique life experiences and influence conservation behavior and attitudes (Raedeke et al, 2001). And the rest of my family must be involved since participatory farm-family management involves everyone in defining goals and objectives that can foster participation in and

commitment to the family farm or a desired goal can be difficult or even impossible to reach (Rausch, 2001).

Chapter 3- Methods

The initial start of the two USDA contracts was in the spring of 2007 on my Grandparent's farm. The practices and procedures on both the WHIP and CP33 contracts were followed based on the plans drawn out by the Indiana District Wildlife Biologist.**3.1**

WHIP

For the WHIP contract it consisted of three practices: a wildlife shrub planting totaling around three acres in size; a wetland site enhancement with shrubs planted in an existing wetland; and the planting of warm season grass (WSG). This work totaled 21 acres. The WSG part of the contract included other aspects relating to the biologist plan which included adding things like firebreaks, internal disked strips and external disked strips which will be discussed later in the procedural part of the WSG part of the contract in greater detail. For the CP 33 contract it consisted of planting around eight acres of WSG while leaving two acres not planted outlined in the biologist plan to grow natural.

For the wildlife shrub planting over half of the shrubs were planted in late April in 2007 using a mechanical tree planter, which is pulled behind a tractor making a groove in

the soil where the trees are placed at the correct spacing and depth shown in figure below.



Figure 4. Shrub planting in 2007 using a mechanical planter making grove with shrub present. Source : Author

With the following years until the end of shrub planting in 2010 all the shrubs were planted by hand with a planting bar. But where planted at the beginning of April every year after being picked up at the state nursery and some roots were trimmed unlike the planting in 2007 using the tree planter. The shrub spacing was the same every year with a spacing of eight feet between the rows and eight feet within the row of shrubs. The species of shrubs selected was based on wildlife benefits along with site conditions present. This provided the greatest success of survival of the new shrubs without high plant mortality unlike selecting shrubs not matching soil conditions to the plant preferences. All the shrubs planted were from the Vallonia state nursery and consisted of 4300 shrubs from 2007 to 2010. With the species being hazelnut, paw paw, smooth sumac, common chokecherry, black chokeberry, elderberry, American plum, Washington hawthorne, flowering dogwood and persimmon. For every year the planting site was sprayed with herbicide (Roundup) or other forms of glyphosate products to control plant

competition around the newly planted shrubs and was done the following year after planting avoiding spray drift on the new shrub planting.

The next practice on the WHIP contract was planting shrubs on an existing wetland called wetland enhancement on the contract. In the spring of 2007 the area was sprayed with a non surfactant herbicide containing glyphosate that is approved for spraying over an aquatic environment. The wetland site has groundwater discharge at the surface and flows through part of the planted area which flows to a creek below. This wetland has two zones with one area having water at the surface all year long with the other having no surface flow present during parts of the year, but still has all the features when defining a wetland. The wetland size is around one acre with around 600 wetland shrubs planted in April of 2007 outlined in figure below.



Figure 5. Wetland site where wetland species were planted in 2007. Source : Author

Planting of the shrubs in the wetland was done using the same 8 by 8 spacing as the rest of the shrubs planted on the contract. All the shrubs planted in the wetland site came from the state nursery at Vallonia and consisted of four species (ninebark, buttonbush, grey dogwood and silky dogwood) that were equal in numbers to get the total

amount planted. Selection of the planting location for the shrubs was based on tolerances to soil water saturation tolerances. The ninebark and buttonbush was planted in the wettest area of the wetland with the two species of dogwoods planted in the drier area of the wetland without surface flow during part of the year. After the spraying the first year to remove the present plant species that have dominated the site for years a greater diversity of wetland species have been present since spraying shown in the picture below.



Figure 6. Swamp Milkweed and many other wetland plant species present after spraying in 2007. Source: Author

The last practice on the WHIP contract was the WSG planting and this was done the last of May 2007. The types of WSG species used were big bluestem, little bluestem, indiangrass, all planted equally to make three pounds per acre as suggested by the

biologist in the plan. With other types of grass added like one pound of side oats gramma and Canada wildrye as outlined in the plan with one pound of forbs that contained 10 different species of wildflowers along with two pounds of annual lespedeza as well. The area was sprayed with herbicide one week before planting with a herbicide called Plateau this herbicide is similar to Roundup herbicides but this type of herbicide provides pre-emergent control for six to eight weeks after spraying.



Figure 7. Sprayed with herbicide and Warm Season Grass was planted on site in 2007.

Source : Author

Using Plateau gives the WGS and forbs a chance to come up and grow before the other plants in the seedbank sprout and compete with the new seedlings. The WSG was planted with a no-till drill with a warm season box present on the seeder allowing the fluffy native grass seed to feed out of the seeder and not cause planting problems.

Three other features are included with the WSG planting; firebreaks had to be established around the units of WSG, along with divisions between the WSG units contained within the firebreaks called internal disked strips. With the last feature include in the WSG plan being external disked strips which are areas outside the WSG units that can be planted every year or planted with permanent vegetation and left for a few years.

All these features firebreaks, internal disked strips and external disked strips are used during the mid-contract part of the contract when burning to control the fire and only burn certain units of WSG leaving other units for following years.



Figure 8. Warm Season Grass section with firebreak and internal disk strip present on WHIP contract in 2011. Source: Author

But all have importance if planted with plants that benefit wildlife allowing as much diversity around the WSG units for different species of wildlife. The firebreaks were planted in the spring of 2007 and have been planted several times since both in the spring and the fall with red and white clover throughout the years. The internal disked strips have been planted twice every year since the summer of 2007 to the present. And there are four of these internal disked strips placed throughout the WHIP contract and have a width of 50 feet and are contained in the firebreaks and dividing areas of the WSG.



Figure 9. Internal Disked Strip dividing the Warm Season Grass Units planted in the fall.

Source: Author

In the spring the planting consists of seed producing plants like sorghum and buckwheat along with other seed producing plants that come up naturally like ragweed. This area is left through most of the year until late fall when the seed has been consumed by wildlife or dropped from the plant and then we plant a combination of grains like rye and wheat

(cover crops). This seed combination are cold hardy and protect the soil throughout the winter and then continue to grow the next year and produce seed in late spring early summer until we plant again in late summer. The external disked strips were established that same time as the firebreaks and were planted with the same clover mixture and have been planted several times since the initial planting. With the width being approximately 50 feet wide and are outside the WSG units in three locations on the WHIP contract.**3.2**

CP 33

The CP33 contract acres were sprayed and planted the same time as the WHIP in 2007. But the seed mixture was different for the CP33 contract and contained two pounds of little bluestem and a half a pound of indiangrass per acre with no big bluestem present with everything else being the same as the WHIP contract. On this CP33 contract approximately two acres was not planted or sprayed and has been left with nothing done to it since 2007.

Since the initial WSG planting on both contracts in 2007 there has been little done until the mid-contract phase of each contract which started in 2010.



Figure 10. View of the CP 33 contract in 2011 after planting in 2007 with a width of 120 feet around the crop field. Source : Author

The mid-contract options used for both contracts contained prescribed burning, some strip disking on the WHIP contract and inter-seeding of forbs on both contracts after burning and strip disking on certain units of the WSG. In the spring of 2010 1/3 of the acreage of WSG on both contracts was burned and inter-seeded with forbs using the same rate and seed mixture as in the initial planting shown below in Figure 11.



Figure 11. Doing a spring burn in 2010 on 1/3 of the acres on the CP 33 contract with inter-seeding of forbs later. Source: Author

Besides the burning in the spring, other areas of WSG on the WHIP contract was strip disked in the fall that same year and inter-seeded with forbs which totaled around eight acres in size. With this spring a different 1/3 of the WSG was burned and inter-seeded just like in 2010. Leaving the remaining units to burn and inter-seed with forbs in 2012 and this will complete the mid-contract management part of both contracts.

Chapter 4- Findings

Before the initial start of both USDA contracts until the present the main reason for signing into these programs was to improve wildlife habitat, or see if a change could be noticed in just a few years through these government contracts with the work my family has done over the years on this farm. With the main emphasis in signing these contracts was to see if bobwhite quail numbers could change from what they were to the present through habitat change along with other wildlife species as well. So before the practices were started I have been conducting two types of population surveys on bobwhite quail one that determines the male quail abundance done three times in June called the call count or bobwhite whistle count.

And the other count which is used to estimate the number of coveys using a certain area called the fall covey call count done in mid October each year. By using procedures outlined in Bobwhite Quail Survey form printed by the Indiana Divisions of Fish and Wildlife along with other information on the specific procedure to do this type of study through David Howell Indiana Quail Unlimited and (Wellendorf et al, 2004). Both population surveys have been conducted since June of 2006 until mid October of this year from the same centrally located position each year on the farm. The quail population numbers have remained about the same before the contracts through the mid-contract part of the contracts till this year in October.

Year	Spring Call Count (June)	Fall Covey Count (Mid Oct)
2006	1	1
2007	2	1
2008	2	2
2009	3	2
2010	2	1
2011	2	1

Table 1. Quail Count on Farm 2006-2011 Source: Author

Although quail numbers have not increased like what we thought they would by changing the habitat through these contracts. Other species have increased on the property like deer and turkey with this habitat change. And some bird species have become more abundant then before the start of these contracts with the presence of areas of WSG throughout the farm. With one species of bird the blue bird showing the greatest

increase in population by building and placing nest boxes throughout the property since 2006.

Some of the other changes that have taken place since the initial start of these two contracts to the present are the changes to the land. Since the completion of the conservation practices for both the WHIP contract and CP 33 contract on my grandparent's farm.

Chapter 5- Discussion

Besides wildlife, both USDA contracts have given my family a means to change the land use from what it was to what it is now on the farm. This change would not be possible based on the amount of out of pocket expense that would be required if no government contracts were available to pay for the expenses. Since the start of both contracts the plant community has changed with less invasive species present with more native vegetation present after the work on the farm was completed. With one example of this change on the wetland site before any planting was done there was less diversity of plants with just a few non-native species present that dominated the site. By spraying with herbicide and eliminating the non-native species this allowed the native wetland plants to come up from the seedbank giving this area greater plant diversity unlike before the wetland enhancement practice on the WHIP contract.

For the most part my family's experience has been positive towards both USDA contracts with the changes they have provided through certain practices on the farm. However with time we have experienced some pitfalls relating to certain practices or procedures outlined in both plans on the farm. With the biggest failure being the shrub planting practice along with the wetland enhancement planting on the WHIP contract. Since most of the shrubs planted from 2006 to 2010 did not survive with about 200 hundred shrubs present today with mainly one species left the paw paw. Regarding the wetland enhancement planting, which consisted of four species and approximately 600 shrubs, roughly 25% are alive today with the buttonbush being the main species present on this wetland site.

For both types of shrub plantings all the required maintenance was done as outlined in the biologist plans. With two different planting methods used throughout the years along with same procedures used such as trimming roots on some species to achieve the proper placement in the ground. Other variables like time of planting and soil moisture could have influenced success on these two practices. But other than the first year of planting all the shrubs were planted the same weekend after picking up from the state nursery. For the wetland planting soil moisture was not a variable since it remains constant throughout the year on much of this site. Even after selecting shrubs that have tolerance and grow in this type of water saturated soil the amount of shrubs that survived was a disappointment.

Other things that have not worked out as planned relate to the WSG planting and mid-contract management on both contracts. Throughout the years some species of WSG have become less dominant and have disappeared all together while other species have become thicker and more dominant. With time, one of the main species of grass in the seed mix, little bluestem is disappearing while the indiagrass and big bluestem are taking over the units of grass. This could be to the fact that little bluestem is a dry species of grass tolerating much dryer soil conditions then the other two grasses mentioned. And since this farm has poorly drained soil that stays saturated longer this may explain the reason for the loss of little bluestem in the planting areas. So this point of knowing the soil type must be considered when designing and planting native grass mixes. To always match the soil characteristics to plant tolerances to reduce dominance of certain species and loss of other species like what has happened on are farm.

The last issue as it relates to problems with practices on both contracts is the mid-contract management part which started in 2010. After doing the disturbance on certain units of WSG which involved either burning or strip disking it was required to plant forbs (called inter-seeding) over the areas that got disturbed. The seeding mixture and rate of forbs per acre was the same as the initial planting and was done soon after the disturbance. On all the WSG units burned on both contracts in the spring of 2010 along with this spring and then inter-seeded there was no presence of any plant species in the mix present in the WSG units throughout the growing season. The same circumstance happened after the strip disking was done in the fall with no planted forb component present during the next growing season.

The WSG present in the units out competed the forbs planted and each area was dominated with WSG with little plant diversity unlike what the mid-contract option is supposed to achieve. However no fall burn was done on these units just a dormant spring burn to complete the mid-contract option part of the contract and for us to receive payments for these types of disturbances by the NRCS. But a fall burn is supposed to benefit the forbs and suppress the WSG giving the forbs a chance to become established in the WSG units which is the main goal in doing this type of disturbance. In the future a fall burn with inter-seeding of forbs on some WSG units will be done on the farm to see if a greater diversity of plants can be achieved with this practice.

Based on our results the last 2 years, a spring burn of WSG and inter-seeding of forbs seemed like a waste of time and money for the USDA to make payments on this type of practice. Although the fall disking and inter-seeding we did happened during an

extremely dry fall which could have led to poor results with little seed even sprouting in the fall and making it through the winter to be present the next year. So a fall disking could have promise just like a fall burn to suppress the WSG while allowing the forbs to become established before the native grasses regain dominance in the plant environment. The year we did the fall disking could have been just a bad year and if it was done other years the results maybe would be different based on the weather variable.

For us the pitfalls are minor considering the overall goal was to change the land for are personal goals of increasing wildlife on this farm. By not signing the contracts and not receiving funding through these two USDA contracts my family would not have spent the roughly nine thousand dollars to implement this change. This would leave the farm at a state that was to the point of not being usable on many parts of the farm, without some major investment by our family. With my family goals of increasing wildlife on this property meet in many aspects while other aspects can be experimented with and adjusted to benefit wildlife. Since the framework is there by using these two USDA contracts maybe with time and adjusting some practices all are goals can be meet.

Chapter 6- Conclusion

Both the WHIP and CP 33 contracts have provided a means to implement change on my grandparent's farm toward are personal goals. Without these programs we would not have had the opportunity to see if land use change from what it was in the past to the present could increase wildlife abundance with time. Since the financial cost to implement these conservation practices would not be justified even for my family not including my aunt and uncle that have a share in the farm along with a decision. So the farm would be left the way it was before the contracts without any work being done.

This project provided a means for me to evaluate the many conservation practices that were done on the farm over the years since 2007 when the practices were started. This provided me with valuable tools regarding habitat restoration, as well as on the ground experience gained from monitoring the changes and how they relate to successful and unsuccessful outcomes. Through this experiment I can make adjustments the next time to hopefully improve on the results. Even without some goals not being met or were not noticed on the farm like bobwhite quail population numbers or the shrub planting aspect to name a few.

The overall experience of the WHIP and CP 33 and the conservation practices that were done on the farm was positive for me and my family with little negative aspects. But these two USDA contracts on the farm involved more than just following the guidelines stated in the plans and the work was completed. Land management for us and anyone else is complex with many factors and variables that must be considered to try and achieve the desired outcome. And land managers must always remember that the

land was changing before the practices started and will continue to change once the practices end.

The USDA contracts on private land do provide a means of protecting the land for future generation without the landowner funding the whole project. But for are family on the practices completed there could be some recommendations to the USDA or NRCS that would be helpful for anyone undertaking the same type of land management with the same type of practices planned.

- Patience is key since species like WSG(warm season grass) take several years to develop.
- Land Management is never done it's always changing.
- Not all practices will go according to the plans laid out at the start.
- Many uncontrolled variables could impact results.
- The work does not end after the planting phase is completed that is just the start.
- Constant monitoring of the land is very important and should be mentioned.

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APPENDIX A

BIOLOGIST MAP AND PLAN OF WHIP



NOT IN SCALE

Warm Season Grasses & Forbs

Firebreak Internal Disked Strip

Shrub Lespedeza Shrub Planting

///// = Strip Disked Area

///// = Possible Wetland

INDIANA DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FISH AND WILDLIFE
WILDLIFE DISTRICT 17
2010 S. State Road 3
North Vernon, IN 47265
(812) 346-6888

WILDLIFE HABITAT IMPROVEMENT PLAN (WHIP)
for

Chris Armstrong
404 S. Cheryl Drive
Muncie, IN 47304
(765) 288-8607
(765) 744 5710 (cell)
e-mail: army12250@aol.com

Switzerland County, Indiana
Pleasant Twp.,
T05N, R12E, Sec. 11
Waypoint: WH0678CA01

Developed Acres = 27.08 acres
WHIP Acres = 25.94 acres

N.R.C.S. Use:
Farm # = 217
Tract # = 325

WHIP Practice Codes:
2a = 7.28 acres
2d = 13.15 acres
2g = 20.99 acres
15c = 20.99 acres
15f = 1.76 acres
16 = 0.5 acre

Wildlife Species Benefited: Bobwhite quail; turkey; deer; rabbits; song birds

Prepared by:
Ed Guljas
District 17 Wildlife Biologist
April 12, 2006
Revised April 20, 2006

Wildlife Habitat Improvement Plan

Listed below are some general wildlife management recommendations for your area. Also included is an aerial photograph with proposed developments color coded.

SHRUB LESPEDEZA:

1. Plant 15 foot strips and clumps where shown. Total is about 1.14 acres.
2. Space seedlings 3 feet apart in the 15 foot strips and in the clumps.
3. Plant five rows in the 15 foot strips.
4. Total seedlings needed: about 5500
5. Use Thunbergii variety
6. Follow planting directions in handout.
7. Establish prior to the end of May.

SHRUB PLANTINGS:

1. Plant assortment of shrubs where shown. Total is about 1.76 acres.
2. Space seedlings about 8 feet apart. Total seedlings needed about 1200.
3. Select variety of shrub species such as: Arrowwood; Black Chokeberry; Elderberry; Hazelnut; Highbush Cranberry; Indigobush; Nannyberry; Silky Dogwood; Red-osier Dogwood; Gray Dogwood; Sumacs; the Sargent variety of Flowering Crabapple; Winterberry; American Plum; and Washington Hawthorne. Note: American Plum forms clones, or thickets.

INTERNAL STRIP DISKED AREA:

1. Establish strips in middle of warm season grass plantings, orienting plots to take advantage of the most level ground.
2. Make strips about 50 feet wide and contained within the firebreak as shown ..
3. Apply fertilizer and lime per soil test prior to seeding.
4. Plot may be plowed and/or disked and allowed to remain idle in which case annual forbs will become established, such as ragweed, foxtail, etc.
5. Strip may also be planted to annual grains such as oats, wheat, buckwheat, corn, sorghum, sudan grass, millet, sunflower, soybeans, cowpeas, partridge pea, etc. If deer depredation is a problem, plant the taller growing sudan grass.
6. Utilize strips as firebreaks when warm season grass units are burned. Disk strips thoroughly before initiating burn.

/////// = STRIP DISKED AREA:

1. Establish strips in areas shown.
2. Plots may be plowed and/or disked and allowed to remain idle in which case annual forbs will become established, such as ragweed, foxtail, etc.
3. Fall Disking is recommended over Spring disking.
4. Strips may also be planted to annual grains such as oats, wheat, buckwheat, corn, sorghum, sudan grass, millet, sunflower, soybeans, cowpeas, partridge pea, etc. or a permanent food plot(s) of alfalfa, clover or annual lespedeza, such as Korean, may be established. If deer depredation is a problem, plant the taller growing sudan grass.
5. Make strips as long as possible and at least 25-30 feet wide.

/////// = SHALLOW WATER WETLAND CREATION:

1. Per your WHIP practice requirements, no more than 25% of the surface area shall exceed 3 feet in depth.
2. Stockpile the topsoil when the marsh bottom is excavated; place it/spread it back over the completed bottom to provide a fertile seed bed for aquatic plant development.
3. No cereal bowl bottom and/or slopes. Avoid straight-line shorelines, inundations will enhance its benefit. The more irregularities, the better; it will increase diversity.
4. If the presence of nesting waterfowl (especially Canada geese) is desired, one or more nesting islands should be created in the wetland.
5. Artificial, non-permanent nesting structures may also be installed after the wetland is constructed.
6. Fall seed the new levee with winter wheat using a 1 bushel/acre rate.
7. Frost seed (January-February) the switchgrass seed on to the levee using an 8 lbs./acre rate.

LADINO CLOVER FIREBREAK:

1. Establish ladino clover in 20 foot strips where shown. Total is about 3.25 acres.
2. Amount of seed needed to be determined by planting method: 4-8 pounds per acre if broadcast; 2-6 pounds per acre if drilled.
3. Apply fertilizer and lime per soil test prior to seeding.
4. Clover should be planted between January and the first of May or during August. Legume seed should always be inoculated with nitrogen-fixing bacteria prior to seeding, especially if the legumes have not been grown on the site recently. If the legume seed has not been pre-inoculated, the proper inoculant should be obtained separately and mixed with the seed prior to planting.
5. The seed should be planted on a firm, bare soil, seed bed. Establish with a drill or by broadcasting.
6. Broadcast seed will do better if the bed is rolled after broadcasting.
7. Mow strips in September and prior to March 1 after establishment if needed to control invasion by other vegetation.
8. Periodic applications of certain herbicides will help control invasion by other vegetation. Determine type of invasive vegetation and treat with appropriate herbicide. Treatment must not take place between March 1 and July 15 of any year.
9. Periodic reseeding may be necessary.

NATIVE WARM SEASON GRASSES (WSG):

1. Establish where shown. Total is about 17.74 acres. Seed at 3.0 PLS pounds warm season grass mixture, 2 pounds annual lespedeza and 1 pound of wildflowers per acre.
2. You will need: 13.30 PLS pounds Little Bluestem; 13.30 PLS pounds Sideoats Grama; 13.30 PLS pounds Indiangrass; 13.30 PLS pounds Big Bluestem; 35.48 pounds annual lespedeza and 17.74 pounds of wildflowers.
3. Be sure that grass seeds are well mixed together. ***Be sure Dealer provides***

the amount in PLS (Pure Live Seed) as explained on page 2 of A Warm-Season Grass Establishment @ Fact Sheet provided.

4. Be certain wildflower mix includes at least five (5) species and that 20% of the mix is Partridge Pea and 20% is Illinois Bundle Flower.
5. The mix of flowers needs to be tolerant of an imazapic herbicide. Imazapic is an active ingredient of Journey
6. herbicide.
7. If the annual lespedeza and flower seed is placed in with the grass seed, it will run through the drill faster. Therefore, run the drill around the perimeter of the grass planting first to form a flower border or **consider placing the annual lespedeza and the flower seed in the grass/legume hopper on the drill.**
8. Consider renting no-till drill from local S&WCD office which will require a 50-60 HP tractor equipped with hydraulics to operate.
9. Seed bed needs to be well prepared. The optimum time for planting WSG is from mid-April through June, after soil temperature reaches a minimum of 55 degrees F. Seed germination will occur above 65 degrees F. It is imperative that the seed should not be planted deeper than 1/4 inch!!! This is the most common mistake made when planting WSG. It is better to have the seed somewhat exposed on the soil surface than to have it planted too deep. See literature provided.
10. No fertilizer or lime is needed on WSG plots. Fertilizer will only encourage competing plants thus suppressing WSG development. And unless soil pH is below 6.0 then lime is unnecessary.

STRIP DISKING AND INTERSEEDING MANAGEMENT OF WSG:

1. One third to one half of the total acres may be disked during any one year and after the third year of the Warm Season Grass establishment.
2. The disking can **only** be conducted outside the nesting period of March 1 through July 15 of any year.
3. The **best** time to disk is in the Fall of the year (late October) on strips that have been mowed in late September. The mowing will promote the decay of existing vegetation and allow for a better exposure of soil during the time of disking.
4. The mowed/disked strips should be 30-50 feet in width **and** alternated with undisturbed strips (2 or 3 depending upon if one half or one third of the area will be treated during any one year) of the same width, following the contour of the land.
5. In late October, after the mown material has had a chance to decay, disk the mowed strips heavily enough to provides 40%-70% bare soil in each strip, equally distributed throughout the area of disturbance. This may involve more than one pass with the disk in each strip.
6. In January or February, frost seed legumes and wildflowers at a 2 pounds of annual lespedeza and 1 pound wild flower rate per acre, using same mixture

- as when originally planted.
7. If spring disking is preferred, that should be done prior to March 1, preferably on strips that have been mowed in the Fall of the previous year. The mowing will promote the decay of existing vegetation and allow for a better exposure of soil during the time of disking.
 8. The legumes and forbs may then be drilled or broadcast into the disked strips. If broadcasting is used, that should be followed by cultipacking.

BURNING AND INTERSEEDING MANAGEMENT OF WSG:

1. After the third or fourth growing season, burn every other unit. Burn remaining units the following year. Repeat cycle every three years.
2. **Conduct burn according to an Approved Burn Plan obtained from the District Wildlife Biologist. Request plan at least two months prior to the planned burn.**
3. Interseed unit at a rate of 2 lbs annual lespedeza and 1 lbs wildflowers per acre. Be sure that the flower mixture consists of 20% Partridge Pea and 20% Illinois Bundleflower.
4. If burn takes place during winter and ground is still freezing and thawing (generally January and February), interseeding may be conducted by broadcasting.
5. If burn takes place when weather is warmer, interseeding should be conducted by drilling. Or by disking, cultipacking, broadcasting and cultipacking again.
6. Do not disturb firebreaks.

Time Line Toward Establishment

SEPTEMBER (If applicable):

Mow the vegetation where the WSG will be planted and, if possible, remove it to provide a cleaner seed bed for planting. Burning is a good way to accomplish this. Be certain adequate firebreaks are in place and that you are competent, equipped **and have an Approved Burn Plan obtained from the District Wildlife Biologist. Request plan at least two months prior to the planned burn.** Then allow 1-2 weeks for the grass to recover and spray the area with a tank mix of 10 gallons of water, 1–1.5 qt. of Roundup, 6-7 ounces of a nonionic surfactant, and 1.7 pounds ammonium sulfate, per acre.

WINTER TIME (if applicable):

Consider establishing firebreaks. Prepare 20 foot seed beds and frost seed clover in January or February.

FEBRUARY-MARCH:

Consider burning the fields to remove vegetative debris if the mowing residue was not removed last September; but, ONLY if you are competent, equipped **and have an Approved Burn Plan obtained from the District Wildlife Biologist. Request plan at least two months prior to the planned burn.** Otherwise, mow vegetation as low as possible.

APRIL-JUNE:

Cool season vegetation should be actively growing (6-12" height) and soils should be warming. You should treat the area with herbicide. In the firebreaks, only a glyphosate product (such as RoundUp) should be used. In the WSG planting area a mixture of a glyphosate herbicide with a product containing imazapic (such as Journey) should be used.

If Journey is used, the recommended per ACRE rate is: 28 ounces of glyphosate herbicide (>40%), 11 ounces of Journey herbicide and 1 quart of MSO with 10-20 gallons of water.

Read and follow all directions and warnings for these products before using.

Be certain not to spray the firebreaks with Journey as this product will prevent germination of the clover seeds.

Do NOT spray outside of the planting areas.

Imazapic is a herbicide similar to Roundup Ultra, it is absorbed through the foliage of the plant and translocated to the stems and roots. Its additional benefit is its pre-emergent control of most plants except many forbs and WSG (although switchgrass has a reduced tolerance) for 4-8 weeks after application. So, when imazapic is applied then the clock starts running - you want to have a drill available and ready so you can plant the WSG/forbs ASAP to make advantage of this residual control.
--

Now begin planting. Forb seeds tend to fall to the bottom of the seed box resulting in a higher population of wildflowers in the initial/beginning passes. Thus, if you begin planting along the roadside edge of a field then more wildflowers will be seen from the road. Maintain a watchful eye and check periodically that the seed is not being planted over 1/4" deep - this is critical!!!

In June, July and August, monitor the WSG planting for competing weeds and grasses. Some competition is acceptable, but if this becomes heavy, the field(s) should be mowed but, not below 8" and NEVER low enough to mow new developing WSG or flowers. If you used Journey then mowing probably won't be needed, or perhaps once later-on after the herbicide's affect has worn-off (10-12 weeks post-application). If Journey was not used then periodic mowing may be required (i.e., in June, July and August).

Controlled burning, **according to an Approved Burn Plan obtained from the District Wildlife**

Biologist at least two months prior to the planned burn, about every 3 years is the best form of management.

Grasses may be mowed down before burning if desired, or, a 50 foot strip mowed between firebreak and the rest of the grasses to create a wider firebreak. Do not burn all “units” at the same time, rather skip every other one so that some mature WSG is always present.

ADDITIONAL:

1. Allow present brushy areas to remain as these provide good wildlife escape cover and food.
2. Edges of tree lines may be cut back, with trees remaining where they fall to provide ground cover.
3. Brushpiles may also be established to provide refuge. Place stumps, concrete chunks, pallets, etc., on ground and pile limbs and brush on top. Make as large as possible.
4. Cedar trees may be cut just enough to push them over and allowed to remain alive. Where possible, fell trees so that they touch or lay on top of one another.
5. Establish access lanes throughout brushy areas. Seed these to bluegrass and white Dutch clover at the rate of 4 pounds bluegrass and 2 pounds white Dutch clover per acre.
6. Keep lanes mowed on a regular basis during the growing season.
7. Allow grown up fence lines separating fields to remain. Keep trees cut to prevent shading out brushy, low growing vegetation such as blackberries. Pile cut trees limbs and branches on discarded man-made material to provide refuge for rabbits and other wildlife.
8. Consider leaving strips of unharvested crops, such as corn and soybeans, next to good winter cover.
9. Hold off mowing grassy areas, except lanes, until after the middle of August to prevent destruction of ground nesting wildlife and nests.
10. Rabbit production may benefit by sodium supplementation. See Fact Sheet provided.

ESTIMATED MATERIALS LIST

SEED		
	CLOVER STRIPS	WARM SEASON GRASSES/FORBS
White Ladino clover	19.5 pounds if broadcast; 13 pounds if drilled.	
Little Bluestem		13.30 PLS pounds
Sideoats Grama		13.30 PLS pounds
Indiangrass		13.30 PLS pounds
Big Bluestem		13.30 PLS pounds
Forbs (Wildflowers --- at least 5 species, of which 20% is Partridge Pea and 20% is Illinois Bundleflower)		17.74 pounds (of which 3.55 pounds is Partridge Pea and 3.55 pounds is Illinois Bundleflower)
Annual Lespedeza		35.48 pounds

APPENDIX B

BIOLOGIST MAP AND PLAN FOR CP-33

Armstrong, Chris



NOT IN SCALE

Warm Season Grasses & Forbs Buffer

Natural Succession Buffer

INDIANA DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND WILDLIFE

WILDLIFE DISTRICT 17

2010 S. State Road 3

North Vernon, IN 47265

(812) 346-6888

CP33 Quail Buffer

Management Plan

Switzerland County, Indiana

Pleasant Twp.,

T05N, R12E, Sec. 11

Farm # = 217

Tract # = 325

Total CP33 Acres = 8.6 acres

Mid-Contract Management Option: Interseeding preceded by Strip Disking

Prepared by:

Ed Guljas

District 17 Wildlife Biologist

April 7, 2006

Wildlife Habitat Improvement Plan

Listed below are the requirements for your CP33 Quail Buffer acreage, including the mid contract management option you have chosen.

MID CONTRACT INTER-SEEDING OPTION:

1. This is to be conducted after the 3rd year of Warm Season Grass establishment.
2. One third of the total CP33 Buffer acreage must be done annually until all acres have been affected. This will normally be over a three year period, **although additional cost share is available if the total procedure is repeated during the contract period. Check with FSA Office.**
3. Seeding **must** be conducted outside the normal nesting season dates of March 1 through July 15.
4. Seeding rates are 2 lbs. annual lespedeza and 1 lb. wildflowers per acre.
5. Be certain wildflower mix includes at least five (5) species and that 20% of the mix is Partridge Pea and 20% is Illinois Bundle Flower. The mix of flowers needs to be tolerant of an imazapic herbicide. Imazapic is an active ingredient of Journey herbicide.
6. Inter-seeding is most effective when following a disturbance such as burning, disking or herbicide application. The disturbance should be performed in the fall or winter, with the legume inter-seeding occurring in late winter or spring.
7. See Fact Sheet Provided

MID CONTRACT LIGHT STRIP DISKING OPTION :

1. Total is 8.6 acres.
2. The disking can **only** be conducted outside the nesting period of March 1 through July 15 of any year.
3. **Additional cost share is available if the total procedure is repeated during the contract period. Check with FSA Office.**
4. The **best** time to disk is in the Fall of the year on strips that have been mowed in late August or early September. The mowing will promote the decay of existing vegetation and allow for a better exposure of soil during the time of disking.
5. If spring disking is preferred, that should be done prior to March 1, preferably on strips that have been mowed in the Fall of the previous year. The mowing will promote the decay of existing vegetation and allow for a better exposure of soil during the time of disking.
6. When laying out strips, be sure to follow the contour of the land on sloping ground to prevent erosion.
7. One third of the total acres enrolled in CP 33 acres **must** be disked during any one year and after the third year of the Warm Season Grass

establishment.

8. The disking ***must*** be done in a manner that provides 40%-70% bare soil in each strip, equally distributed throughout the area of disturbance. This may involve more than one pass with the disc in each strip.
9. The disked strips ***must*** be 30-50 feet in width ***and*** alternated with undisturbed strips 3-4 times the affected width, following the contour of the land.
10. Areas of undisturbed vegetation (filter strips) ***must*** be left adjacent to all water bodies to maintain water quality.

NATURAL SUCCESSION BUFFER:

1. Establish where shown in widths indicated.
2. Total is about 1.87 acres.
3. Agricultural management practices must be terminated on this acreage to allow natural plant succession to occur.
4. A temporary cover, such as winter wheat or oats, will be established where erosion is a concern or where noxious weeds are expected to be a problem.
5. Consider including a light legume seeding to enhance the wildlife value. See legume fact sheet provided for best legume species to use based on site.
6. If the site is suitable, seed annual lespedeza at 2.5 pounds per acre.
7. Apply for the Mid Contract Interseeding option, in addition to the initial option (burning, disking or spraying), and use a suitable legume for the interseeding, once again depending on the site.

NATIVE WARM SEASON GRASSES (WSG) BUFFERS:

1. Establish buffers where shown in widths indicated.
2. Total WSG acreage is about 6.73 acres.
3. Seed at 3.0 PLS pounds warm season grass mixture, 2 pounds annual lespedeza and 1 pound of wildflowers per acre.
4. Total seed required: 13.5 PLS pounds Little Bluestem; 5.0 PLS pounds Sideoats Grama; 1.7 PLS pounds Indiangrass; 13.5 pounds annual lespedeza and 6.73 pounds of wildflowers.
5. Be sure that grass seeds are well mixed together. ***Be sure Dealer provides the amount in PLS (Pure Live Seed) as explained on page 2 of A Warm-Season Grass Establishment @ Fact Sheet provided.***
6. Be certain wildflower mix includes at least five (5) species and that 20% of the mix is Partridge Pea and 20% is Illinois Bundle Flower. The mix of flowers needs to be tolerant of an imazapic herbicide. Imazapic is an active ingredient of Journey herbicides.
7. If the annual lespedeza and flower seed is placed in with the grass seed, it will run through the drill faster. Therefore, run the drill around the perimeter of the

grass planting first to form a flower border or *consider placing the annual lespedeza and the flower seed in the grass/legume hopper on the drill.*

8. Consider renting no-till drill from local S&WCD office which will require a 50-60 HP tractor equipped with hydraulics to operate.
9. Placing oats on top of the warm season grass seed will help push it down into the seed chutes.
10. Seed bed needs to be well prepared. The optimum time for planting WSG is from mid-April through June, after soil temperature reaches a minimum of 55 degrees F. Seed germination will occur above 65 degrees F. **It is imperative that the seed should not be planted deeper than 1/4 inch!!! This is the most common mistake made when planting WSG. It is better to have the seed somewhat exposed on the soil surface than to have it planted too deep.** See literature provided.
11. No fertilizer or lime is needed on WSG plots. Fertilizer will only encourage competing plants thus suppressing WSG development. And unless soil pH is below 6.0 then lime is unnecessary.

Time Line Toward Establishment

SEPTEMBER (If applicable):

Mow the vegetation where the WSG will be planted and, if possible, remove it to provide a cleaner seed bed for planting. Burning is a good way to accomplish this. Be certain adequate firebreaks are in place and that you are competent, equipped and have **an Approved Burn Plan obtained from the District Wildlife Biologist. Request plan at least two months prior to the planned burn.**

Then allow 1-2 weeks for the grass to recover and spray the area with a tank mix of 10 gallons of water, 1–1.5 qt. of Roundup, 6-7 ounces of a nonionic surfactant, and 1.7 pounds ammonium sulfate, per acre.

FEBRUARY-MARCH:

1. Consider burning the fields to remove vegetative debris if the mowing residue was not removed last September; but, ONLY if you are competent, equipped and have **an Approved Burn Plan obtained from the District Wildlife Biologist. Request plan at least two months prior to the planned burn.** Otherwise, mow vegetation in warm season grass fields as short as possible.

APRIL-JUNE:

Cool season vegetation should be actively growing (6-12" height) and soils should be warming. You should treat the area with herbicide. A mixture of a glyphosate herbicide with a product containing imazapic (such as Journey) should be used.

If Journey is used, the recommended **per ACRE rate** is: 28 ounces of glyphosate herbicide (>40%), 11 ounces of Journey herbicide and 1 quart of MSO with 10-20 gallons of water.

Read and follow all directions and warnings for these products before using.

Do NOT spray outside of the planting areas.

Imazapic is a herbicide similar to Roundup Ultra, it is absorbed through the foliage of the plant and translocated to the stems and roots. Its additional benefit is its pre-emergent control of most plants except many forbs and WSG (although switchgrass has a reduced tolerance) for 4-8 weeks after application. So, when imazapic is applied then the clock starts running - you want to have a drill available and ready so you can plant the WSG/forbs ASAP to make advantage of this residual control.

Now begin planting. Forb seeds tend to fall to the bottom of the seed box resulting in a higher population of wildflowers in the initial/beginning passes. Thus, if you begin planting along the roadside edge of a field then more wildflowers will be seen from the edge. Maintain a watchful eye and check periodically that the seed is not being planted over 1/4" deep - **this is critical!!!**

In June, July and August, monitor the WSG planting for competing weeds and grasses. Some competition is acceptable, but if this becomes heavy, the field(s) should be mowed but, not below 8" and NEVER low enough to mow new developing WSG or

flowers. If you used Journey then mowing probably won't be needed, or perhaps once later-on after the pre-emergent affect has worn-off (10-12 weeks post-application). If Journey was not used then periodic mowing may be required (i.e., in June, July and August).

ADDITIONAL RECOMMENDATIONS (NOT REQUIRED):

1. Allow present brushy areas to remain as these provide good wildlife escape cover and food. Edges of tree lines may be cut back, with trees remaining where they fall to provide ground cover.
2. Brushpiles may also be established to provide refuge. Place stumps, concrete chunks, pallets, etc., on ground and pile limbs and brush on top. Make as large as possible.
3. Establish access lanes throughout brushy areas. Seed these to bluegrass and white Dutch clover at the rate of 4 pounds bluegrass and 2 pounds white Dutch clover per acre.
4. Keep lanes mowed on a regular basis during the growing season.
5. Allow grown up fence lines separating fields to remain. Keep trees cut to prevent shading out brushy, low growing vegetation such as blackberries. Pile cut trees limbs and branches on discarded man-made material to provide refuge for rabbits and other wildlife.
6. Consider leaving strips of unharvested crops, such as corn and soybeans, next to good winter cover.
7. Hold off mowing grassy areas, except firebreaks and lanes, until after the middle of August to prevent destruction of ground nesting wildlife and nests.
8. Rabbit production may benefit by sodium supplementation. See Fact Sheet provided.

ESTIMATED MATERIALS LIST

SEED		
Little Bluestem		13.5 PLS pounds
Sideoats Grama		5.0 PLS pounds
Indiangrass		1.7 PLS pounds
Forbs (Wildflowers --- at least 5 species, of which 20% is Partridge Pea and 20% is Illinois Bundleflower)		6.73 pounds (of which 1.4 pounds is Partridge Pea and 1.4 pounds is Illinois Bundleflower)
Annual Lespedeza		13.5 pounds

NOTE: Plant legumes in Natural Succession Buffer. Acreage is 1.87. Use seeding recommendation based upon best legume species for site. See Legume Fact Sheet provided.