Restoring a Forest Legacy at Marais des Cygnes National Wildlife Refuge

A Forestland Restoration Partnership between the US Fish and Wildlife Service and The Conservation Fund

Project Design Document for Gap Validation • Version 1.3 • 22 February 2018

Project Location: Linn County, Kansas, USA
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Auditor: Christie Pollet-Young, Director, Greenhouse Gas Verification, Natural Resources Division, SCS Global Services, cpollet-young@scsglobalservices.com, 510-452-9093
CCB Standard: First Edition
Project Validation: 9 July 2009 (Gold Level)
Project Verification: 9 May 2014 (next verification audit scheduled for April 2019)
Project Start Date: 1 January 2008 (original plantings); additional areas to be planted in 2017-2018
GHG Accounting Period: 100 years

Project Summary: The project is a proposed addition of 669 acres (271 ha) of bottomland hardwood forest restoration, bringing the total project area for the previously validated and verified project to 1,445 acres (585 ha). Restoration is achieved by planting native hardwood trees on marginal agricultural lands that had historically been bottomland hardwood forest adjacent to the Marais des Cygnes River. The three primary goals of the project are to: 1) decrease the effects of climate change via carbon sequestration; 2) restore Kansas’s bottomland hardwood forest ecosystem, and 3) create long-term community benefits in the form of recreational lands under the management of the USFWS for hunting, fishing, wildlife photography, wildlife observation, environmental education, and environmental interpretation. The additional forest restoration at Marais des Cygnes is estimated to increase CO₂e sequestered in live trees, standing dead trees, understory, down dead wood, forest floor, and soil by approximately 336 MT CO₂e per acre at age 100. The restoration effort will have significant positive effects on biodiversity values associated with the Marais des Cygnes National Wildlife Refuge, particularly for migratory and resident birds. The original project received Gold Level validation for complying with requirements for adaptive management, knowledge dissemination, adapting to climate change, carbon benefits withheld from regulatory markets, capacity building, best practices in community involvement, native species use, and biodiversity impact monitoring.
EXECUTIVE SUMMARY

This Project Design Document (PDD) reflects new restoration efforts at the previously validated and verified Restoring a Forest Legacy at Marais des Cygnes National Wildlife Refuge forest restoration project. The PDD is for a gap validation that specifically addresses the proposed addition of 669 acres of new restoration areas to the overall project total. The project is a unique opportunity to restore native bottomland hardwood forests that will benefit fish and wildlife, enhance water quality along the Marais des Cygnes River, create new areas for public recreation, and trap carbon dioxide.

On behalf of the US Fish and Wildlife Service, the nonprofit Conservation Fund used donations from its supporters to restore the original 776 acres of marginal agricultural land within the boundary of the Marais des Cygnes National Wildlife Refuge, located in Linn County in eastern Kansas, USA. This project was validated to the First Edition of the Climate, Community and Biodiversity Standard at the Gold Level on 9 July 2009. The project was subsequently verified on 9 May 2014.

An additional 669 acres of restoration are proposed to be added to the project, bringing the total project area to 1,445 acres. The new restoration areas are immediately adjacent to the original restoration sites and—like the original sites—consist of marginal agricultural lands in what was formerly bottomland hardwood forest. The newly restored native bottomland hardwood forest will be managed by the US Fish and Wildlife Service to ensure its long-term protection and stewardship. The carbon offsets that are generated from this project will be retired and cannot be sold or banked for future offset purposes. Verification of all project activities, including planting the new restoration areas, is scheduled for April 2019.

This project has been designed to:

- decrease the effects of climate change via carbon sequestration;
- restore Kansas’s bottomland hardwood forest ecosystem; and
- create long-term community benefits in the form of improved recreational lands under the management of the US Fish and Wildlife Service for hunting, fishing, wildlife photography, wildlife observation, environmental education and environmental interpretation.

Since 2005, the Fund has helped to engage Fortune 500 companies, their customers and employees, as well as other organizations and individuals seeking a positive response to two of our nation’s most pressing environmental challenges: habitat loss and climate change. In a time when public financing for land conservation and habitat restoration is at a historic low, voluntary contributions are providing new private capital that is used to further the Fund’s mission to conserve and restore our nation’s land and water legacy for current and future generations. From these projects, the nation derives—and will continue to receive for many years into the future—significant public benefits, including cleaner air and water, restored wildlife habitat, and enhanced areas for public recreation.
All of the Fund’s forest-based carbon sequestration activities are conducted exclusively with state and federal natural resource agencies, including the US Fish and Wildlife Service. These organizations employ some of the world’s top wildlife biologists, foresters, and environmental professionals who serve as long-term stewards and monitors of the forests once they are restored. The Fund and the US Fish and Wildlife Service have entered into a Memorandum of Understanding that allows all of the Services’ National Wildlife Refuges to benefit from the Fund’s restoration program, building upon nearly a decade of partnership between the Fund and the US Fish and Wildlife Service to advance the science of carbon sequestration through reforestation.

The Fund’s carbon sequestration programs have helped to restore over 20,000 acres with more than 6 million trees that will capture an estimated 7.2 million tons of carbon dioxide equivalent from the atmosphere over their lifetime. Much of this activity has taken place on National Wildlife Refuge lands.

The National Wildlife Refuge System Improvement Act of 1997 requires each refuge to develop a Comprehensive Conservation Plan for achieving Refuge objectives consistent with sound principles of fish and wildlife management, conservation, legal mandates, and Fish and Wildlife Service policies. The National Environmental Policy Act requires each plan to examine a full range of alternative approaches to Refuge management and to involve the public in selecting the approach best suited to each Refuge’s purposes. This Project will implement many of the stewardship and management activities prescribed in the Marais des Cygnes NWR Comprehensive Conservation Plan.

The Marais des Cygnes National Wildlife Refuge was established to protect a unique and diverse landscape, including an intersection of ecosystems joining the northernmost bottomland hardwood habitats of the Southeast and the prairies of the Great Plains. Today this bottomland hardwood ecosystem represents the last hardwood stand remaining in Kansas or anywhere in the Mountain-Prairie Region of the Fish and Wildlife Service. Restoring these lands is one of The Conservation Fund’s highest priorities, resulting in cleaner air, cleaner water, and enhanced biodiversity for wildlife and people alike.
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EXHIBITS
A. Maps and photographs of restoration sites proposed to be added to the project area in 2017
B. Response letter from VCS to The Conservation Fund, dated 11 April 2017, regarding a request to have additional restoration areas gap validated by desk audit
G1. ORIGINAL CONDITIONS AT PROJECT SITE

G1.1 Location and Basic Physical Parameters

The Marais des Cygnes National Wildlife Refuge ("Marais des Cygnes NWR") was established in 1992 to protect bottomland hardwood habitats along the Marais des Cygnes River in Linn County, Kansas. The name, Marais des Cygnes, comes from the French language and means Marsh of the Swans. Trumpeter Swans, which were historically common in the Midwest, used the wetlands adjacent to the Marais des Cygnes River during spring and fall migration.

Located just 70 miles south of Kansas City, Marais des Cygnes NWR spans a 9,300-acre acquisition boundary between U.S. Highway 69 and the Missouri state line on either side of the Marais des Cygnes River in eastern Kansas. The Refuge owns approximately 7,500 acres within the 9,300 acre boundary; approximately 1,800 acres within the boundary remains in private ownership. Immediately west of the Refuge is the 7,600 acre Marais des Cygnes Wildlife Area, administered by the Kansas Department of Wildlife and Parks ("State Wildlife Area").

Figure 1: Map of Marais des Cygnes National Wildlife Refuge
The fragmented forest landscape at Marais des Cygnes NWR represented an important opportunity to restore habitat and ecosystem connectivity. While the Refuge land was managed by the United States Fish and Wildlife Service (“USFWS” or “the Service”), much of it had little immediate value for wildlife. Many acres across the Refuge that were historically forested are now covered by annual and perennial weeds or used for agricultural purposes. It is likely that the weeded areas would have continued to be a nuisance for the USFWS because the goldenrod-broomsedge habitat was unusually dense and prohibited any other type of growth from occurring. Restoring the acreage to its natural, forested condition was a high priority for the Refuge, but there was limited or no funding available to support those efforts. After years of searching for public and private financing, an innovative partnership emerged that restored the biological integrity of the land, and at the same time, helped sequester carbon dioxide.

In early 2008, The Conservation Fund (“the Fund”) worked with the Service to plant native seedlings across 35 non-contiguous parcels, consisting of 776 acres, within Marais des Cygnes NWR using donations from its program supporters. The Tracts are managed by the Refuge as forested habitat for wildlife, including but not limited to waterfowl and neotropical songbirds. Over their lifetime, these newly restored forests are expected to sequester thousands of tons of carbon dioxide equivalent from the atmosphere. In addition to the benefits to biodiversity and climate, restoring these lands to their native habitat will help stabilize the top soil and slow the rate of erosion, thereby reducing the sediment load into the Marais des Cygnes River. These restored lands will also provide new recreational areas for public enjoyment.

The map below (Figure 2) illustrates the locations of the original restoration tracts and the new restoration tracts within the Refuge. The proposed 669 acres of new restoration areas are also shown on maps in Exhibit A. These new areas are located within the boundary of the Marais des Cygnes NWR, immediately adjacent to the existing restoration tracts.

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1 Marais des Cygnes Comprehensive Conservation Plan [hereinafter Marais des Cygnes CCP], pp. 30
Climate

Marais des Cygnes NWR has a continental climate typical of the interior United States. The climate is characterized by large daily and annual variations in temperature. Winters are cold due to frequent southerly flows of air from the polar regions. Warm summer temperatures last for about six months and the transition seasons are fairly short. The average daily temperature in winter is about 31.0 F and summer average daily temperature is 79.4 F.

The Refuge is in the path of a fairly dependable current of moisture-laden air from the Gulf of Mexico. Precipitation is heaviest in late spring and early summer, much of it occurring as late-evening or nighttime thunderstorms. Precipitation averages 38.53 inches per year, with the highest monthly amounts occurring in spring and fall.
Elevations at the Refuge are approximately 800 feet above sea level. The combination of elevation and latitude gives the area a fairly long growing season that will exceed 200 days in most years.  

**Geology and Topography**

The topography of the Refuge, including the restoration tracts, lends itself to water retention. The Refuge has many natural scours, or low spots, about 5 inches in depth. These low spots are sometimes characterized as “ephemeral wetlands,” or depressional wetlands, that temporarily hold water in the spring and early summer or after heavy rains. Periodically, these wetlands dry up, often in mid to late summer. They are isolated without a permanent inlet or outlet, but may overflow in times of high water. They produce abundant quantities of food for developing amphibians, reptiles and migrating birds, especially waterfowl.

**Soils and Hydrology**

The soil types on the restoration tracts are either Osage (silty clay) series or Verdegris (silty loam) series, both productive soil types naturally suited to bottomland hardwoods. These heavy clay soils do not have high rates of percolation or infiltration and retain moisture for a long time.

The hydrology of Marais des Cygnes NWR is heavily influenced by the Marais des Cygnes River. The main stem of the Marais des Cygnes River is approximately 177 river miles in length from the Kansas-Missouri state line to its headwaters south and west of Topeka, Kansas. Many of the restoration tracts are directly on the river bank and all of the parcels lie within the watershed (within a half mile of the River). The River is characterized by high turbidity and high sediment load.

The Marais des Cygnes River overflows its banks about once every ten years. When the river does overflow, the floodwaters usually recede relatively quickly (within 10 days). Although the bottomland forests don’t receive water often from overbank flows, these areas retain water throughout the winter and spring due to the combination of heavy rainfall and clay soils that characterize the area. After a rainfall, standing water can remain in pockets up to 4 or 5 inches

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2 Marais des Cygnes CCP, pp. 11

3 Personal communication, Marais des Cygnes Refuge Biologist, Tim Menard

4 Marais des Cygnes CCP, pp. 13
deep. These soil conditions, combined with the topographical features such as the natural scours described above, are responsible for the bottomland hardwood habitat.  

G1.2 Vegetation

A variety of vegetation exists on the Refuge. Habitat types include forest, wetlands, native prairie-savanna and introduced grasses and cropland. The riparian, bottomland hardwood forests of Marais des Cygnes NWR represent the last remaining hardwood forest stands across the Mountain-Prairie Region of the Service, including Kansas. Surveys from the 1850s highlighting the original 3,300 acres of bottomland forest along the Marais des Cygnes River show that almost 55 percent or 1,800 acres have since been converted to cropland or pasture. Much of the remaining forest has been cut at least once. However, excellent mature or near-mature stands of pecan, oak, walnut, sycamore, ash, hickory and maple can be still be found along the River.

Prior to restoration, 85% of the restoration tracts were covered with thick goldenrod and broomsedge, which had colonized the site in the mid-1990s when the property was taken out of agriculture, and this dense cover of grasses and forbs prohibited the growth of other species. The remaining 15% was being used as farmland and was leased by the Refuge to tenant farmers—primarily for corn, wheat, and sorghum—until the restoration project was implemented.

In order to select parcels for the restoration project, the Marais des Cygnes NWR Biologist consulted General Land Office (GLO) surveys and an 1856 historical vegetation map, which provided insight as to the historic location of forests in the Refuge area. GLO surveyors traversed the country during the 1850s approximating the forest-prairie boundary, and although the boundary was sometimes indistinct and often transient, changing over time due to fire, bison, and other disturbances, the GLO surveys offered useful guidance regarding historic forest location.

When the restoration parcels mature, the predominant vegetation on the tracts will be mixed oak floodplain woodlands. This habitat type is characterized by cold-deciduous woodlands that span gently sloping soils within floodplains along major rivers and streams.

G1.3 Current Carbon Stocks at the Project Site

The global climate change benefits of reforestation projects are widely recognized. Land use change—especially deforestation—is a significant component of increasing atmospheric CO₂
levels and a cause of global warming. Thus, reforestation represents a natural way to reduce these effects and combat climate change.

Current carbon stocks at the project site were previously described in the 2009 PDD and in the 2014 Project Implementation Report (PIR). Please refer to section G1.3 in these documents.

Pre-project carbon stocks (i.e., on the lands prior to reforestation) on the new restoration sites in woody biomass carbon stocks are zero. Non-woody (herbaceous) biomass is neglected and assumed to be equal in the baseline and the “with-project” scenario so there is no need to quantify it. The only significant current carbon stock at the project site is the soil carbon.

G1.4 Communities Located in and Around the Project Area

Marais des Cygnes NWR, which includes all of the restoration tracts, is located in Linn County, Kansas, which is 39 miles south of the Kansas City Metropolitan Area. Linn County has a population of approximately 9,767 people. In 2007, the median household income for Linn County was $41,251. The average median household income for Kansas in 2007 was $47,341; the median for the United States was $50,233.

For additional information please refer to this section in the 2009 PDD and the 2014 PIR.

G1.5 Current Land Use and Land Tenure at the Project Site

The Marais des Cygnes NWR was officially established in 1992, and additional Refuge lands have been added over time, purchased by the Service at fair market value from individual willing sellers.

The restoration tracts are noncontiguous parcels all included within Marais des Cygnes NWR and owned by the Service. The Refuge had been looking for a restoration partner for several years before an agreement was negotiated with the Fund. Planting of the original tracts began in late December 2007 and continued through early 2008, and now the entire project area is managed by USFWS as forested wildlife habitat. The new restoration areas will be planted in 2017 and 2018.

The new restoration areas, like the original tracts, are a mix of marginal agricultural lands leased to local farmers or abandoned agricultural lands dominated by invasive herbaceous plants.

For additional information please refer to this section in the 2009 PDD and the 2014 PIR.

G1.6 Current Biodiversity in the Project Area

A primary project goal of the Fund and USFWS—in addition to carbon sequestration objectives—was to restore biodiversity within the project area by providing larger areas of connected habitat within the Refuge. Bottomland hardwoods are particularly important to

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9 U.S. Census Bureau, QuickFacts, available at: http://quickfacts.census.gov/qfd/states/20/20107.html
wildlife due to their permanent nature and high level of plant diversity; floodplain hardwoods, being the most diverse of this group in plant species, are also the most diverse in animal species.

The hardwood bottoms, which are seasonally flooded by rainfall, provide an important habitat type for birds, and more than 300 avian species use the area at various times of the year. The emphasis at Marais des Cygnes NWR is on management for neotropical migrants, which nicely compliments management practices at the adjacent State Wildlife Area, which is primarily managed for waterfowl. The State Wildlife Area has approximately 1,100,000 waterfowl use-days during an average year, including 60,000 ducks and 20,000 geese per year and the extreme seasonal population can reach 130,000 ducks and 40,000 geese. Enhanced management within the Refuge could bring waterfowl use-days to a level equal to that now experienced at the State Wildlife Area.

When the bottomlands are not flooded, they provide habitat for deer, quail, squirrel, turkey, and other species. Mammals occurring in the area are diverse and include furbearers as well as game species. Bats, armadillos, coyote, mink, fox, beaver and chipmunk can all be found on the Refuge.

The Marais des Cygnes River is home to an unusually large and diverse freshwater mussel community and contains one of the top three concentrations of mussel diversity within the state of Kansas. Mussel species found in the River include the flat floater mussel (a state-listed threatened mollusk) and the strongest population of three ridge mussels within Kansas, along with many others including the butterfly mussel, fragile papershell mussel and yellow sandshell mussel. The River also provides habitat to numerous fish species including catfish, sunfish, bass and carp. Reptiles and amphibians, including turtles, frogs, toads, lizards, snakes and salamanders are also found on the Refuge.

There is currently not a wide range of biodiversity on the restoration tracts because the project areas were recently covered in grasses and forbs or used for farmland. Farmland that will be converted to bottomland hardwood forest has historically provided a food source for migrating birds. As the newly planted forest matures, it will rapidly begin to provide habitat to numerous species and enhance biodiversity in the area. The young tree seedlings will immediately offer shelter for field sparrows and indigo buntings. When the new forest is between ten and thirty years old, it will be home to the brown thrasher, American woodcock, and Bell’s vireo. After forty years, red- headed woodpecker, yellow-billed cuckoo and orchard orioles will inhabit the forest. In the future, the mature bottomland hardwood forest will provide habitat for the Cerulean warbler, prothonotary warbler, Acadian flycatcher, wood thrush, and red-shouldered hawk. In addition to bird species, the forest will also provide homes for other resident wildlife, including long- tailed weasel, bobcat and grey fox. The improvements in water quality caused by the restoration effort will also enhance the freshwater mussel communities living in the Marais des Cygnes River by improving habitat conditions.

G1.7 IUCN Red List Threatened Species

Please refer to this section in the 2009 PDD and the 2014 PIR.

10 Marais des Cygnes CCP, pp. 22
G2. BASELINE PROJECTIONS

G2.1 Land Use Without Project

In order to carry out recommendations of the CCP, the Refuge had been looking for a restoration partner for several years before an agreement was negotiated with the Fund to restore the tracts. If the Fund had not undertaken the original restoration project, it is likely that the weeded areas would have continued to be a nuisance for USFWS because the goldenrod-broomsedge habitat was unusually dense and prohibited any other type of growth. The parcels being used for agricultural purposes would have continued being used as farmland. USFWS did not have the funds necessary to restore the land to bottomland hardwoods on its own; rather, the restoration of this land hinged on the Fund’s ability to leverage multiple funding sources including private resources from individual and corporate donors.

A similar land-use without the project scenario applies to the new restoration areas. As with the original restoration areas, these areas would have continued to be used as farmland or they would be abandoned and likely taken over by goldenrod and broomsedge.

G2.2 Future Carbon Stocks Without Project

Carbon stock changes without the project would be of limited size and significance. Carbon accrual in the areas dominated by goldenrod and broomsedge would be minimal as these plants prevent the establishment of tree seedlings due to their density. The carbon capture associated with agricultural plants is also considered to be zero as this sequestration would not be sustained over the long term because the agricultural products are harvested every year. The soil carbon stocks would also remain relatively constant. There is the potential for some small loss in soil carbon stocks as the land is managed over time. Lastly, the carbon emissions associated with agricultural management and use of fertilizers on the farmed parcels would most likely continue.

G2.3 Local Communities Without Project

Prior to being restored by the Fund, the restoration tracts (original and proposed) were either farmed or overrun with weeds and not suitable for recreational purposes. Without the restoration effort, the land would most likely have remained in this condition. Once the land is restored, however, local residents can use it for hunting and recreation. The restoration actions not only benefit the tracts themselves, but also improve the neighboring land by enhancing biodiversity through forest connectivity. The overall quality of the Refuge will be improved and more easily enjoyed by local residents.

G2.4 Biodiversity Without Project

Without the project, the land (original and proposed tracts) would have remained covered in weeds or in agricultural production, which would have an small positive impacts. Farmland that will be converted to bottomland hardwood forest has historically provided a food source for migrating birds. These non-forested parcels were interspersed broadly throughout the Refuge. Forest holes, such as those that existed at Marais des Cygnes NWR, lead to diminished bird nesting success, increased predation, and increased brood parasitism, especially from the brown-headed cowbird. Forest fragmentation created an atmosphere where cowbirds, who thrive in forest openings and edges, posed a large threat to other bird species. Without the project, many bird species would suffer from increased brood parasitism from the cowbird, leading to a decline in species richness.
G2.5 Water and Soil Resources Without Project

In the absence of the project, the soil would remain covered by goldenrod-broomsedge habitat or, on the parcels used for agricultural purposes, the soil would continue to be farmed. The lack of native forest cover would continue to exacerbate problems with erosion resulting in high sediment load in the Marais des Cygnes River. Once restored, erosion will be reduced due to new forest establishment, which will replenish both soil carbon and soil nutrients. The soil quality of the Tracts will be healthier due to increased diversity of plant life and biomass accumulation associated with forest regeneration. Also, the new canopy will effectively protect the soil from harsh winds and rain, both factors that contribute to soil erosion. In addition, many of the restored tracts are along the riverbank and the new forestland will help reduce sediment load into the river, which will improve water quality.

G3. PROJECT DESIGN AND GOALS

G3.1 Project Scope and Summary of Goals

The scope of the restoration initiative originally included restoring approximately 776 acres of land to its native bottomland hardwood forest habitat by planting it with tree species indigenous to the area. The proposed additional 669 acres would bring the total project area to 1,445 acres.

The three primary goals of the project are:

- Decrease the effects of climate change via carbon sequestration
- Restore Kansas’s bottomland hardwood forest ecosystem
- Create long-term community benefits in the form of recreational lands under the management of USFWS for hunting, fishing, wildlife photography, wildlife observation, environmental education and environmental interpretation.

G3.2 Description of Project Activities

For information about the original project activities please refer to this section in the 2009 PDD and the 2014 PIR.

The main project activities associated with the new restoration areas will include updating the monitoring plan to include the new tracts, site preparation and planting, project monitoring, and validation.

Site Preparation and Planting

In early 2017, 233 acres of the new restoration areas were planted using the same methods employed during the original planting effort (for additional information please refer to this section in the 2009 PDD and the 2014 PIR). The remaining acres will be planted in 2018.

Project Monitoring

Project monitoring, including survival analysis and tree volume measurements and estimates, will be performed in accordance with the updated monitoring plan that was prepared by
TerraCarbon in 2011 and verified during a 2014 audit (for additional information please refer to this section in the 2009 PDD and the 2014 PIR).

**Validation**

This new restoration areas will be validated by a third party and the offsets retired\(^{11}\).

**G3.3 Project Location**

Maps of the original and proposed project site locations are provided in G1 and a map of the new restoration areas is also included in Exhibit A.

**G3.4 Project Timeframe**

The Fund planted the original tracts with native bottomland hardwood trees in late December 2007 and through early 2008 and the new restoration areas will be planted in 2017 and 2018. The first seedling survival analysis was conducted by the Refuge biologist after the first growing season, in late summer of 2008. The project activities will be most intensive during the first few years of the Initiative when planting and the majority of monitoring activities will be taking place. Under the MOU, USFWS will provide long-term management of the land. The accounting period for the carbon offsets generated on the restoration tracts is 100 years.

**G3.5 Risks to Climate, Community and Biodiversity Benefits**

For each restoration project, the Fund works with the nation’s leading public natural resource agencies and non-governmental organizations to ensure that trees are planted in protected areas that have long-term management plans to ensure accuracy and certainty of carbon sequestration. Project areas with high risk of loss, such as from fire or drought, often do not qualify.

Careful risk assessments were made before choosing to restore the restoration tracts in Linn County; this land was selected for restoration for several reasons. The tracts are located in a relatively wet area, which reduces risk of drought and also minimizes risk of fire. The risk of damage from storms is also fairly low. Although tornadoes do occur in eastern Kansas, they happen rarely and their impact is usually confined to a small area. By planting tracts scattered throughout the Refuge, the project design has dispersed the risk of tornado damage, and large numbers of trees are unlikely to be affected should a tornado occur.

While there is always a small but potential risk due to human activities such as unlawful hunting or reckless destruction, the low population density in the area directly surrounding the Tracts, as well as law enforcement vigilance by the Refuge, makes human interference with the project unlikely.

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\(^{11}\) TCF makes no claims regarding specific carbon credits that would require VCS certification. TCF does not sell carbon credits from its restoration projects and, instead, pairs its projects with supporters who wish to offset their carbon footprint through support of TCF’s restoration efforts. Climate benefits associated with a specific restoration effort are associated with specific project supporters at a particular point in time and can’t be used by any other party (i.e., they are “retired”).
G3.6 Stakeholder Identification

The stakeholders for the project as a whole remain the same (for additional information please refer to this section in the 2009 PDD and the 2014 PIR) and the concept of adding additional restoration acres in the vicinity of the initial restoration sites was discussed with stakeholders when the project was initiated.

Three farmers were using the new restoration areas under lease arrangements with the Refuge and Refuge staff have maintained personal contact with them regarding the restoration effort. Two of the farmers were supportive of the restoration effort and remain farming in the area. The third farmer told the Refuge two years ago that he was going to stop farming on the Refuge, so the restoration effort matches well with his timing. The farmer understands the purpose of the restoration effort, but naturally laments the loss of any agricultural lands.

G3.7 Transparency and Project Information Availability

Please refer to this section in the 2009 PDD and the 2014 PIR.

While the project benefits a wide range of the public, the primary stakeholders include a focused group of project funders/supporters, Refuge staff and volunteers, USFWS regional staff, local farmers, and Refuge visitors. TCF maintains direct personal contact with funders/supporters via email and phone contact and personal visits. These stakeholders have a direct interest in the project and TCF has sought their input on the project scope and schedule throughout the planning process. Refuge staff maintain personal contact with local and regional stakeholders through direct meetings, email, and phone calls. As noted above, restoring bottomland hardwood forests on the Refuge is part of the CCP, which went through an extensive public planning process. The specific new restoration sites are expected elements within this larger planning effort. Refuge staff have held meetings with local farmers, Refuge staff, regional USFWS staff, and local State wildlife biologists, among others, as the scope and timing of the new restoration effort was developed. In most cases this consultation has been between Refuge staff and local stakeholders, but regional USFWS staff have also come to the Refuge to participate in stakeholder consultation.

The updated May 2017 PDD went through the CCBA public comment period, although no comments were received. An updated October 2017 PDD will go through an additional public comment period and TCF and Refuge staff will publicly announce the comment period, provide copies of the PDD on websites, and maintain copies of the PDD at Refuge Headquarters.

G4. MANAGEMENT CAPACITY

G4.1 Management Team Experience

Please refer to this section in the 2009 PDD and the 2014 PIR.

G4.2 Management Capacity and Project Scale

Please refer to this section in the 2009 PDD and the 2014 PIR.

12 The 2009 PDD and the 2014 PIR refer to TCF’s “Go Zero Program”. TCF is retiring the “Go Zero” name as part of an updated marketing effort. This change, however, does not alter TCF’s restoration program in any way.
G4.3 Technical Skills of Project Team

Please refer to this section in the 2009 PDD and the 2014 PIR.

G4.4 Financial Health of Implementing Organizations

Please refer to this section in the 2009 PDD and the 2014 PIR.

G5. LAND TENURE

G5.1 Private Property and Land Rights

All Refuge lands have been acquired from willing sellers. The Service paid fair market value for all property acquired, based on real estate appraisals. The farmers who leased space on the Refuge were given advance notice regarding the Service’s intention to reforest the agricultural parcels.

G5.2 Voluntary Nature of the Project

As noted above in G5.1, all of the lands acquired to establish the Refuge, including all of the restoration tracts, were purchased from willing sellers.

G5.3 Potential In-Migration

Not relevant to project.

G6. LEGAL STATUS

G6.1 Compliance with Laws

Please refer to this section in the 2009 PDD and the 2014 PIR.

G6.2 Approval from Appropriate Authorities

As stated above, the Fund has a signed agreement with USFWS recognizing the Fund’s ability to plant and restore land on National Wildlife Refuges. The current version of the agreement is valid from 1 October 2015 through 30 September 2022.13

G7. ADAPTIVE MANAGEMENT FOR SUSTAINABILITY

G7.1 Generation of Reliable Feedback

Please refer to this section in the 2009 PDD and the 2014 PIR.

G7.2 Documentation of Decisions

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13 The MOU between TCF and the USFWS makes reference to the “Go Zero Program”. As noted above, TCF is phasing this term out as part of an updated marketing effort. This change, however, does not change the relationship between TCF and the USFWS or the terms of the agreement.
Please refer to this section in the 2009 PDD and the 2014 PIR.

G7.3 Project Flexibility

Please refer to this section in the 2009 PDD and the 2014 PIR.

G7.4 Commitment to Long-term Sustainability

Please refer to this section in the 2009 PDD and the 2014 PIR. The new planting areas only expand the acreage of habitat restoration and do not change the project design or implementation in any material way, including with regards to adaptive management or commitment to long-term sustainability.

G8. KNOWLEDGE DISSEMINATION

G8.1 Documentation of Project Lessons Learned

Please refer to this section in the 2009 PDD and the 2014 PIR.

G8.2 Dissemination of Information

Please refer to this section in the 2009 PDD and the 2014 PIR. Marais des Cygnes is the first Refuge supporting a CCBA-certified restoration effort that has proposed to expand the acres being restored after project validation and verification. While project design and implementation won't change, it is the first Refuge to go through the CCBA gap validation process. This provides a unique opportunity for knowledge dissemination to other Refuges with existing CCBA projects or refuges that are considering such projects.
CLIMATE SECTION

CL1. NET POSITIVE CLIMATE IMPACTS

CL1.1 Estimation of Net Changes in Carbon Stocks

Net changes in carbon stocks for the original restoration tracts have been previously estimated (please refer to this section in the 2009 PDD and the 2014 PIR).

The additional forest restoration at Marais des Cygnes is estimated to increase CO2e sequestered in live trees, standing dead trees, understory, down dead wood, forest floor, and soil by approximately 248 metric tons of CO2e/acre (i.e., 273 short tons per acre) at year 50 and 336 MT CO2e per acre at age 100. An estimated 669 acres will be added to the project area, resulting in a total 100-year estimated additionality impact of 224,784 MT CO2e. The total planting area will be established upon the completion of the 2018 planting activities. These net changes in carbon stocks associated with the incremental change from the new planting areas will be verified during the 2019 verification audit.

CL1.2 Non-CO2 greenhouse gases

Please refer to this section in the 2009 PDD and the 2014 PIR.

CL1.3 Net Climate Impact

Please refer to this section in the 2009 PDD and the 2014 PIR.

As noted above, the climate model predicts 248 metric tons of CO2e/acre (i.e., 273 short tons per acre) at year 50, and 336 metric tons of CO2e/acre (i.e., 370 short tons per acre) at year 100. The annualized average for the first 50 years is 5.5 metric tons of CO2e/acre per year (i.e., 6 short tons of CO2 equivalent per acre per year).

CL2. OFFSITE CLIMATE IMPACTS

CL2.1 Leakage

It is unlikely that leakage due to this project will be a major concern. According to a white paper published by the Offset Quality Initiative, reforestation and afforestation projects are less likely to be affected by potential leakage impacts than other carbon projects. In this case, the primary concern is that because lands were taken out of agricultural production and restored to trees, the tenant farmers who previously used the land may clear healthy forests to create more viable agricultural lands offsite. However, the individuals who farmed on the new restoration tracts have no intentions of clearing any forested lands. These actions are representative of an overall trend; cropland use in the region as a whole has been declining.

since 1950.\textsuperscript{15} Therefore, no activity leakage should be expected as a result of this project and no leakage has been observed since project initiation in 2009.

\textbf{CL2.2 Mitigation of Negative Offsite Impacts}

Because no offsite impacts attributable to project leakage are anticipated, no direct actions will be necessary to mitigate their effect.

\textbf{CL2.3 Net Effect of Climate Impacts}

The total net effect of this project when considering the offsite impacts will be positive. As noted above, the expected offsite impacts will be small.

\textbf{CL3. CLIMATE IMPACT MONITORING}

\textbf{CL3.1 Monitoring Plan}

\textit{Please refer to this section in the 2009 PDD and the 2014 PIR.}

Initial seedling survival in the expanded planting areas will be monitored by US Fish and Wildlife staff one growing season after seedlings have been established and results will be reported to TCF. An updated monitoring plan will include additional permanent plots to monitor standing live biomass. The updated monitoring plan that includes the additional restoration areas will be verified during the 2019 verification audit.

\textbf{CL4. ADAPTING TO CLIMATE CHANGE AND CLIMATE VARIABILITY}

\textbf{CL4.1 Regional Climate Change Impacts}

\textit{Please refer to this section in the 2009 PDD and the 2014 PIR.}

\textbf{CL4.2 Measures Taken to Anticipate Climate Change Impacts}

\textit{Please refer to this section in the 2009 PDD and the 2014 PIR.}

\textbf{CL5. CARBON BENEFITS WITHHELD FROM REGULATORY MARKETS}

All of the carbon benefits generated by the project will be withheld from regulated greenhouse gas markets and will be retired upon their sale.

The new restoration areas are a minor extension of an existing project that has been validated and verified by SCS and the CCBA. There is nothing new, therefore, in terms of project design or implementation. As previously noted, TCF does not create, issue, or sell carbon credits. TCF, instead, designs forest restoration projects that are intended to have a positive impact on climate, community, and biodiversity values, which is why TCF was an early-adopter and proponent of the CCBA system in North America. TCF works with project sponsors who support our forest restoration initiatives, but we do not sell carbon credits from these lands.

Proponents, instead, sign on in support of the project, which happens to have real and measurable climate benefits. TCF and its project sponsors seek CCBA certification as a means of verifying that our project designs are sound. As noted above, we tie specific projects to specific funders and the benefits associated with individual projects are "retired" in the sense that they can never be applied to another funder's interests. Should TCF ever decide to sell specific emission reductions or carbon credits from these projects, then we would certainly consider the VCS system.
COMMUNITY SECTION

CM1. NET POSITIVE COMMUNITY IMPACTS

CM1.1 Community Benefits

*Please refer to this section in the 2009 PDD and the 2014 PIR.*

The anticipated change in benefits to communities are generally associated with increases in biodiversity values due to the increasing size of restored forest interior habitat. In association with these improved habitat benefits, there will be additional areas available for hunting, education, and nature appreciation. The magnitude of these benefits, however, are anticipated to be within the margin of error associated with community benefits described in the initial PDD and as verified in subsequent audits.

CM1.2 Stakeholder Participation in Project Planning

*Please refer to this section in the 2009 PDD and the 2014 PIR.*

Discussions were held with the farmers in advance of the new restoration effort to allow them time to plan for the following growing season. As noted above, Refuge staff and regional USFWS staff met with stakeholders that included farmers, Refuge volunteers and visitors, and State wildlife managers. During and after these meetings, questions and concerns were expressed and addressed by USFWS staff. In some cases, Refuge staff consulted with regional USFWS staff to ensure that stakeholders received a thorough and thoughtful response to their questions and concerns.

CM1.3 Conflict Resolution and Grievance Procedures

*Please refer to this section in the 2009 PDD and the 2014 PIR.*

There were no formal grievances filed as part of the stakeholder consultation process (see CM1.2).

CM2. OFFSITE COMMUNITY IMPACTS

CM2.1 Potential Negative Offsite Community Impacts

*Please refer to this section in the 2009 PDD and the 2014 PIR.*

There are no negative offsite community impacts associated with the original restoration effort or the effort as expanded by the new restoration areas. All impacts on the community are expected to be positive. Some farmers expressed a general regret for seeing agricultural land of any kind taken out of production, but at the community level this is a small change and the farmers understood the ecological benefits associated with habitat restoration.

CM2.2 Mitigation of Negative Impacts

*Please refer to this section in the 2009 PDD and the 2014 PIR.*
CM2.3 Net Social and Economic Impacts

*Please refer to this section in the 2009 PDD and the 2014 PIR.*

CM3. COMMUNITY IMPACT MONITORING

CM3.1 Monitoring Plan

*Please refer to this section in the 2009 PDD and the 2014 PIR.*

The new restoration areas will not result in any changes to how community benefits are monitored. As with climate and biodiversity benefits, the new restoration areas will be integrated into the monitoring plans (i.e., through placement of additional sampling areas) upon successful gap validation and these changes will be presented during the 2019 verification audit.

CM4. CAPACITY BUILDING

The new restoration areas will not result in any changes to the project design or implementation with regards to capacity building, but going through the gap validation process - if successful - provides a unique opportunity for capacity building. While project design and implementation won't change, Refuge managers will now have a specific example of how to increase the acres of restoration on a CCBA certified project to share with other interested refuges.

CM4.1 Accommodates Communities

*Please refer to this section in the 2009 PDD and the 2014 PIR.*

CM4.2 Inclusion of All Groups

*Please refer to this section in the 2009 PDD and the 2014 PIR.*

CM4.3 Inclusion of Women

*Please refer to this section in the 2009 PDD and the 2014 PIR.*

CM4.4 Community Participation

*Please refer to this section in the 2009 PDD and the 2014 PIR.*

CM5. BEST PRACTICES IN COMMUNITY INVOLVEMENT

There are no changes in the project's best practices for community involvement specifically associated with the new restoration areas. Adding these areas, however, has created an opportunity for providing new information about the project to the community. As the restoration areas mature, and there are marked improvements in wildlife habitats, there will be
increasing opportunities for direct engagement with a wide range of community members. The restoration effort also provides an opportunity to demonstrate to the public that the Refuge is meeting the restoration commitment that was made in the CCP.

**CM5.1 Knowledge of Local Customs**

*Please refer to this section in the 2009 PDD and the 2014 PIR.*

**CM5.2 Stakeholder Employment**

*Please refer to this section in the 2009 PDD and the 2014 PIR.*

**CM5.3 Workers’ Rights**

*Please refer to this section in the 2009 PDD and the 2014 PIR.*

**CM5.4 Worker Safety**

*Please refer to this section in the 2009 PDD and the 2014 PIR.*
B1. NET POSITIVE BIODIVERSITY IMPACTS

B1.1 Net Positive Biodiversity Under the Project Scenario

*Please refer to this section in the 2009 PDD and the 2014 PIR.*

The new restoration areas will minor changes in the project design or implementation with respect to the project’s net positive biodiversity impacts. Overall approaches and goals remain the same. Minor negative biodiversity impacts will be associated with the conversion of agricultural fields that provide a food source for migrating birds to bottomland hardwood forest. Adding the restoration areas, however, will have notable biodiversity benefits. Restoration of forested habitat will fulfill the Refuge’s habitat management goals by increasing the area of contiguous forest, including the area of forest interior habitat, the provision of temporarily flooded forested pools, and improved plant composition and structure necessary to support wildlife associated with bottomland hardwood forests. Species that will benefit include forest interior songbirds, wading birds, amphibians, and reptiles. The functional attributes of the forest have been disrupted by agricultural activity prior to refuge establishment and include conversion of forest to other habitat types (grassland, cropland), extensive rill erosion, and remnant ditches that transport water directly to the river rather than pooling in forested depressions. In addition, volunteer germination of trees on upland soils are dominated by undesirable species including eastern red cedar, honey locust, osage orange, and invasive plants, primarily sericea lespedeza, have colonized extensive areas and currently require extensive time and funding to control. Reforestation activities that will involve restoring hydrology, followed by planting with desirable tree species, will help control existing undesirable species and promote future forest conditions that are sustainable and support target wildlife species.

B1.2 Possible Adverse Effects of Non-Native Species

*Please refer to this section in the 2009 PDD and the 2014 PIR.*

B1.3 Threatened Species

*Please refer to this section in the 2009 PDD and the 2014 PIR.*

B1.4 Species Used by the Project

In accordance with the Fund’s planting principles, the new restoration tracts will be planted with native bottomland hardwood forest species chosen by the USFWS and designed to restore the fully functioning natural systems of Marais des Cygnes NWR. Tree species included black walnut, bur oak, green ash, Kentucky coffeetree, hickory, northern red oak, pecan, persimmon, pin oak, post oak, red mulberry, shellback hickory, shumard oak, swamp white oak, sycamore, white ash and white oak.

B1.5 Genetically Modified Organisms

All Conservation Fund projects are planted with natural, native trees. No genetically modified organisms will be used to generate carbon credits from this project.
B2. OFFSITE BIODIVERSITY IMPACTS

Minor biodiversity impacts will be associated with the conversion of agricultural fields that provide a food source for migrating birds to bottomland hardwood forest. As noted above, substantial biodiversity benefits are associated with the addition of the new restoration areas. These benefits will be expressed at the immediate site level as well as at the regional and national level as habitat for migratory birds is improved on the Refuge.

B2.1 Potential Negative Offsite Biodiversity Impacts

Minor biodiversity impacts will be associated with the conversion of agricultural fields that provide a food source for migrating birds to bottomland hardwood forest.

B2.2 Mitigation Plans

The benefits associated with bottomland hardwood restoration of the project sites will benefit the same migratory bird population that see a reduction in migratory food source. Though migratory waterfowl will have diminished food in the form of agricultural grains, those same bird species will realize additional wetland habitat from dozens of small wetlands created throughout the hardwood restoration fields. These benefits will be expressed at the immediate and future site level as well as at the regional and national level as habitat for migratory birds is improved on the Refuge. As the benefits associated with the project apply to the same population that is negatively impacted, no mitigation activities are planned as part of the project.

B2.3 Net Effect of Project on Biodiversity

Minor negative biodiversity impacts will be associated with the conversion of agricultural fields that provide a food source for migrating birds to bottomland hardwood forest. There will be substantial increases in bird species richness associated with the addition of the new restoration areas. These benefits will be expressed at the immediate and future site level as well as at the regional and national level as habitat for migratory birds is improved on the Refuge.

B3. BIODIVERSITY IMPACT MONITORING

Please refer to this section in the 2009 PDD and the 2014 PIR.

There will be no changes to how biodiversity benefits are monitored (i.e., the use of bird point counts will continue). Bird point count plots will be added to the new restoration areas upon successful gap validation of the effort. These updates to the monitoring plan will be presented during the 2019 verification audit, should the gap validation process be successful.

B4. NATIVE SPECIES USE

As previously stated in B1.2, and in accordance with the Fund’s planting principles, all carbon sequestration projects are planted with native trees.

B5. WATER AND SOIL RESOURCE ENHANCEMENT

Please refer to this section in the 2009 PDD and the 2014 PIR.

The new restoration areas have inclusions of wetter soils that have the potential to provide unique wetland features upon implementation of the restoration effort. These wet areas can provide important feeding areas for migrating waterfowl at critical times of the year. While not a material change in project design or implementation, the opportunity to improve wetland habitats is unique to these locations. Implementation of these efforts involves mapping suitable areas, withholding them from planting, and allowing them to revert from agricultural uses to natural wetland habitats. The location and configuration of these areas is part of the restoration effort and the results will be presented during the 2019 verification audit.
CONCLUSION

The 669-acre addition to the project is a unique opportunity to restore Kansas’s native bottomland hardwood forests and help mitigate climate change while conferring community and biodiversity benefits to eastern Kansas. In addition to sequestering carbon dioxide from the atmosphere, the tracts will restore fragmented habitat, enhance water quality along the Marais des Cygnes River, and improve the quality of public recreation areas for all to enjoy.
EXHIBIT A
MAPS AND PHOTOGRAPHS OF NEW RESTORATION SITES
Marias Des Cygnes NWR
Additional Reforestation 2017-18: Aerial 1

Legend
- Marias Des Cygnes NWR
- Additional Reforestation Area
- 2008 MDC Restoration

Map prepared by Kevin Harnish
Date: 12/18/2017
Marias Des Cygnes NWR
Additional Reforestation 2017-18: Aerial 2

Legend
- Marias Des Cygnes NWR
- Additional Reforestation Area
- 2008 MDC Restoration

Map prepared by Kevin Harnish  Date: 12/18/2017
Figure 1. Site preparation equipment.

Figure 2. Existing conditions on new restoration areas.
Figure 3. New restoration area following site preparation.

Figure 4. New restoration area adjacent to wetlands.
EXHIBIT B

RESPONSE LETTER FROM VCS TO THE CONSERVATION FUND REGARDING
GAP VALIDATION PROCESS
11 April 2017

Kevin Harnish
The Conservation Fund
P.O. Box 271
Chapel Hill, NC 27514

Dear Mr. Harnish,

This letter is in reference to your exemption request entitled “Gap Validation for Restoring a Forest Legacy at Marais des Cygnes National Wildlife Refuge Linn County, Kansas, USA” that the Verified Carbon Standard (VCS) received on 31 March 2017.

We understand that your request is for VCS project ID CCB1595 “Restoring a Forest Legacy at Marais des Cygnes National Wildlife Refuge” to be exempted from the requirements stated on page 22 of The Rules for the Use of the Climate, Community & Biodiversity Standards (December 2013) that specify when site visits are required for an audit. Specifically, the exemption request is to allow a gap validation audit to take place without a site visit, given the project proponent’s understanding that posting draft gap validation documentation by 9 May 2017 (i.e., three years from the issuance of the most recent verification report) would permit this.

Based on the information provided to VCS, it is understood that The Conservation Fund misinterpreted The Rules for the Use of the Climate, Community & Biodiversity Standards (December 2013). Upon reviewing the language of the relevant requirement, VCS acknowledges that the language of the requirement is not entirely clear, and understands why the project proponent could have come to their conclusion. In addition, VCS understands that it is the opinion of the auditor chosen for the upcoming gap validation that they would have sufficient evidence for issuance of an opinion about whether the project achieves the requirements of the CCB Standards without a site visit. As such, VCS grants the exemption. Specifically, VCS allows a gap validation audit to take place without a site visit. The project proponent must submit this letter with the project design document for public comment.

This letter will be uploaded to the project record on the VCS project database as a public document.

Yours sincerely,

Julianne Baroody
Climate, Community & Biodiversity Program Manager