



United States Department of the Interior

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Consultation # 02ETAU00-2019-F-1895

Dear Messrs. Mobley and McMahan:

The U.S. Fish and Wildlife Service (Service) received the U.S. Army Corps of Engineers' (Corps) request to reinstate formal section 7 consultation for consultation number 02ETAU00-2019-F-1895 on Corps project number SWF-2018-00227, Permian Highway Pipeline (PHP), digitally on February 27, 2020. The specific project areas are specifically described in the Corps' request to reinstate. The Corps originally requested reinstatement of this consultation based on three proposed reroutes of the pipeline alignment submitted to the Corps by Permian Highway Pipeline, LLC (Applicant). Reinstatement of this consultation is in accordance with 50 CFR 402.16(a). These regulations require reinstatement of consultation: "if new information reveals effects of the action that may affect listed species or designated critical habitat in a manner or an extent not previously considered; or if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion..." The Corps has determined the proposed changes to the pipeline alignment may affect and are likely to adversely affect the golden-cheeked warbler (*Setophaga [=Dendroica] chrysoparia*). In addition, new information regarding potential effects of the PHP has become available since issuance of the Service's February 3, 2020 Biological Opinion (BO), including oak wilt treatment by the Applicant. Supporting documents submitted with your request to reinstate consultation include changes to the project alignment that will result in an increased amount of potential indirect effects to golden-cheeked warbler (GCWA) habitat, and effects not previously considered within the Service's BO analyzing the PHP.

Additionally, a number of matters have come up in the course of clearing for construction which we will address in this document. Based on information provided to the Service by the Applicant on April 13, 2020, we will also include the Applicant's use of a shallow blasting technique further described below. We also use this opportunity to further explain the Service's expectations with respect to the requirement of "continuous activity" in the February 3, 2020, BO, and how that requirement pertains to this project. We address those questions arising from the use of "continuous activity" as it pertains to GCWA specifically for this consultation herein. Further, this addendum addresses resolution of concerns regarding the Applicant's compliance with measures to minimize the potential spread of oak wilt in potential GCWA habitat.

ADDENDUM TO THE BIOLOGICAL OPINION

In the Service's February 3, 2020, BO and Incidental Take Statement (ITS), the Corps and Applicant were required, through Reasonable and Prudent Measures 1 and 2 and their associated Terms and Conditions, to complete GCWA habitat clearing before March 1. These Reasonable and Prudent Measures are intended to ensure that areas in or adjacent to GCWA habitat that was likely to be occupied were cleared prior to the arrival of the species for the breeding season, which typically occurs in early March. Reasonable and Prudent Measures 1 and 2, and their associated Terms and Conditions state "vegetation clearing [within potential GCWA habitat] shall not occur from March 1 to July 31." The Service is aware GCWA habitat within these three reroute locations described below was not cleared by March 1, 2020 due to late routing changes to accommodate specific landowners, the need for Corps action related to crossings of potential jurisdictional waters associated with the reroutes, and the pendency of this reinitiated consultation. Therefore, as the Applicant has already acknowledged, the Applicant shall forego clearing of assessed GCWA habitat at these three locations until after the GCWA breeding season has ended. March 1 to July 31 marks the time window within which GCWA habitat clearing shall not occur; GCWA habitat clearing and pipeline construction may occur after July 31, 2020 and prior to March 1, 2021. The proposed changes to the PHP construction and associated impacts are discussed below, as well as information pertaining to the use of blasting, the meaning of "continuous activity" with respect to areas adjacent to GCWA habitat, and issues concerning oak wilt prevention practices and PHP's offer of additional conservation offsets to address prior concerns regarding delayed treatment of tree wounds.

Changes to the Proposed Action

The proposed changes to the PHP will occur at three specific locations (Figure 1) along the originally planned route. Changes involve rerouting the pipeline near mile post (MP) 283 in Gillespie County, and MP 337 and 340 in Hays County. The proposed changes will occur in previously delineated potential (and assumed occupied) GCWA habitat, and will result in additional consequences to the habitat. Due to the proposed changes and reinitiation of consultation, the March 1 end date for habitat clearing as mandated by Reasonable and Prudent Measures 1 and 2, and their associated Terms and Conditions in the February 3, 2020, BO could not be met. Therefore, habitat clearing and construction of the pipeline, only at these three specific locations, will not occur until August 1, 2020, and GCWA habitat clearing shall be completed by February 28, 2021.

The applicant has proposed the use of proprietary blasting in Kimble and Gillespie Counties. Proprietary blasting may occur near potential GCWA habitat. The blasting technique would only be used as needed when conventional trenching operations are no longer feasible due to the hardness of rock encountered and the limitations of a conventional trencher. Use of a track hammer to break through harder rock is also an option, but the use of a track hammer requires more time to complete the rock breaking work. Use of proprietary blasting to fracture rock is followed by conventional trenching, and is approximately 10 to 20 times faster than use of a track hammer. Use of the shallow blasting technique is described as a brief blast measuring 101 decibels (dB) to fracture rock in preparation for trenching. Use of a track hammer may require two-to-three weeks of work for eight hour per day with a consistent auditory output measuring 84 dB. Blasting would occur during daylight hours and no sooner than two hours after sunrise and no later than two hours before sunset.

The Applicant has proposed an expanded protocol for implementing the oak wilt prevention measures mandated by Reasonable and Prudent Measures 1 and 2, and their associated Terms and Conditions in the February 3, 2020, BO. This expanded protocol is described in the document attached as Enclosure 1 to this correspondence.

Effects of the Action

The proposed reroutes of the pipeline will not result in a net increase of GCWA habitat destruction. The total amount of GCWA habitat destruction remains 282.0 acres. However, these changes to the proposed action will result in a net increase of 14.8 acres of habitat degradation and is in addition to the 1,352.3 acres of degraded GCWA habitat analyzed in the February 3, 2020, BO. Therefore, the amount of degraded habitat increases to a total of 1,367.1 acres. We discuss the variation of habitat degradation at the three locations, and refer to each location as distinct “units” (i.e. MP 283 is a distinct unit, MP 337 is a distinct unit, and MP 340 is a distinct unit). Each unit is defined by the beginning and end points of each proposed reroute and contains both Corps Action Area and Applicant Action Area (refer to the Corps reinitiation request of February 28, 2020). Within these units, we analyze and compare the original alignment and reroutes and their respective impacts to the GCWA in Table 1 below.

After reroutes, GCWA habitat clearing in Unit 283 will result in the majority of change in the amount of habitat destroyed and degraded with an overall increase of 2.3 acres and 13.7 acres of habitat destruction and degradation, respectively. GCWA habitat clearing in Unit 347 will result in an overall reduction of 1.7 acres of destruction and an overall increase of 0.9 acre of degradation. GCWA habitat clearing in Unit 340 will result in an overall reduction of 0.6 acres of destruction and overall increase of 0.2 acres of degradation. Therefore, this rerouting will result in no net gain or loss of habitat destruction, but an additional 14.8 acres of habitat degradation will occur. The 14.8-acre increase in habitat degradation is due to the amount of habitat present within the 300-foot buffer zone adjacent to the proposed reroutes (i.e. more suitable habitat is present adjacent to the new routes than before). After implementation of the proposed changes, a grand total of 282.0 acres (no net change) and 1,367.1 acres (14.8-acre net increase) will be destroyed and degraded, respectively.

The use of proprietary blasting within the cleared construction right-of-way (ROW) will have no impact on the amount of take authorized for the GCWA. Shallow blasting is described as a split

Figure 1. Proposed changes to the PHP alignment will occur near mile post markers 283, 337, and 340.

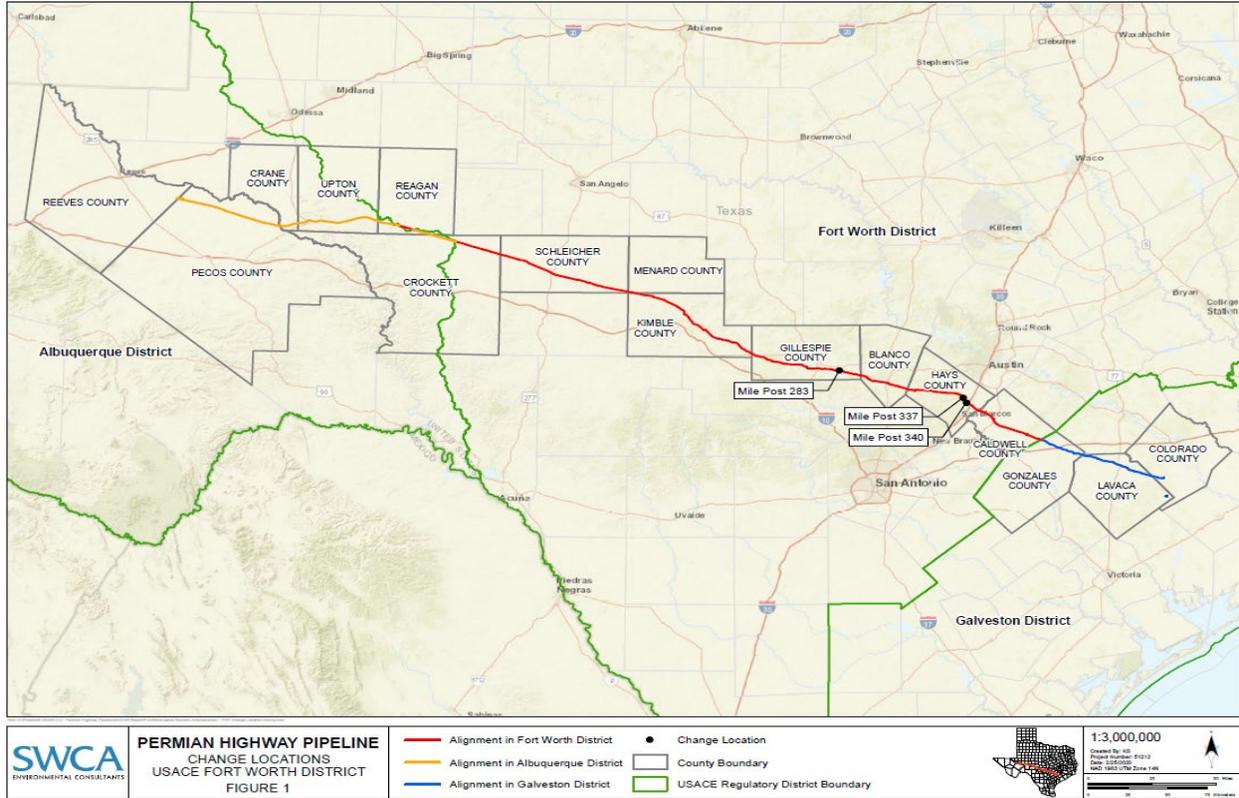


Table 1. Comparison of the amount of habitat destruction and degradation in acres within the Corps' and Applicant's action areas before and after reroutes within three particular units.

	Action Area	Previous Destroyed	Previous Degraded	Revised Destroyed	Revised Degraded	Change Destroyed	Change Degraded
Unit 283	Corps	2.5	12	2.5	13.5	0	1.5
	Applicant	0.7	3.5	3	15.7	2.3	12.2
	Total	3.2	15.5	5.5	29.2	2.3	13.7
Unit 337	Corps	6.3	29.3	3.6	16.4	-2.7	-12.9
	Applicant	5.2	23	6.2	36.8	1	13.8
	Total	11.5	52.3	9.8	53.2	-1.7	0.9
Unit 340	Corps	6.3	26.2	6.9	33.8	0.6	7.6
	Applicant	2.4	13.5	1.2	6.1	-1.2	-7.4
	Total	8.7	39.7	8.1	39.9	-0.6	0.2
Total		23.4	107.5	23.4	122.3	0	14.8

second blast (101 dB) capable of fracturing hard rock in preparation for normal trenching operations. Another option for fracturing hard rock is the use of a track hammer (84 dB), which requires more time, and may last up to three weeks for eight hours per day. The use of proprietary blasting may expose GCWA to a single blast followed by conventional trenching, but this method is 10 to 20 time faster than track hammer use; thus the amount of overall time GCWA are exposed to construction activities will be reduced, and impacts associated with construction and its noise will be minimized.

Issues regarding the prior delays in treatment of oak wounds have been resolved and a more detailed protocol for the prevention of oak wilt has been established (Enclosure 1). In addition, the applicant has committed to the purchase of 67 GCWA conservation credits from a Service-approved conservation bank for the GCWA.

Jeopardy Analysis

The proposed reroutes to the PHP will result in an additional 14.8 acres of degradation to GCWA habitat. This 14.8 acres is in addition to the previously analyzed 1,352.3 acres of habitat degradation. After implementation of the proposed changes a total of 1,367.1 acres of GCWA habitat will be degraded. The additional 14.8 acres of habitat degradation will not result in consequences beyond those already analyzed within the jeopardy analysis in the February 3, 2020, BO.

We note the combined total amount of habitat destruction and degradation increases from 1,634.3 acres to 1,649.1 acres. In the February 3, 2020, BO we discussed the Applicant's preservation of 1,363 acres of GCWA habitat in recovery unit 5. We apply the same GCWA mitigation guidance of 2:1 for destroyed habitat and 0.5:1 for degraded habitat herein. Following the same GCWA mitigation calculations we used in the February 3, 2020, BO, the total amount of land needed to fully offset impacts to the species would be 1,247.55 acres. Therefore, perpetual preservation of 1,363 acres of GCWA habitat in recovery unit 5 is still anticipated to fully offset impacts to the species. The Applicant has purchased these 1,363 acres and will convey them to the Balcones Canyonlands National Wildlife Refuge (Refuge) within six months of the initial authorization of Nationwide Permit 12 (NWP 12). This land will be managed by the Refuge and contribute to the protection of a large contiguous portion of occupied GCWA habitat that is managed for long-term conservation, consistent with the recovery plan for GCWA.

Therefore, given the small increase in habitat degradation, and the binding commitment by the Applicant to fully offset impacts by purchasing 1,363 acres of occupied GCWA habitat, the Service does not expect that the proposed reroutes to the PHP will reduce appreciably the likelihood of both the survival and recovery of the GCWA in the wild by reducing the reproduction, numbers, or distribution of GCWA.

In the event that PHP chooses to continue with the originally authorized route for any reason, the conclusions in the original Biological Opinion still apply and are unchanged.

The use of proprietary blasting to fracture hard rock in preparation for trenching is not anticipated to increase the amount of take (i.e. that amount of destroyed or degraded GCWA habitat will not increase), and is expected to expedite the construction process through those sections of the action area within or near GCWA habitat. The use of proprietary blasting will only be used when rock is too hard to break with conventional trenching machinery. We note another option is the use of a track hammer which requires more time on location (i.e. track hammer use is 10 to 20 times slower); thus substantially increasing the amount of time GCWA may be exposed to construction operations and its associated noise.

Finally, the addition of expanded protocols to the Proposed Action for implementing the oak wilt prevention measures described in Enclosure 1 accounts for the nominal additional effect on the

species as a whole and do not, therefore, create a circumstance where the Proposed Action would reduce appreciably the likelihood of both the survival and recovery of the GCWA in the wild.

Defining “Continuous Activity” in relation to PHP construction in GCWA habitat

The premise of maintaining a continuous construction activity is based on the assumption that after GCWA habitat is cleared, but prior to their arrival for the breeding season, any GCWA nesting adjacent to these cleared areas may arrive and experience negative consequences to breeding from ongoing construction activity and its associated noise, including possibly avoiding nesting in the area. If GCWA arrive to the area and decide to attempt nesting within suitable habitat adjacent to the cleared (ROW), they will have had the opportunity to become habituated to the activity and its associated noise, adapt to the activity and its associated noise, and nest despite the activity and its associated noise. Noise and visual activity created by people, vehicles, equipment, and machinery during PHP construction may modify the habitats used by individual GCWAs by introducing disturbances that can cause such individuals to modify their behavior. Where noise and activity disruptions significantly modify habitats to the extent that the disruptions actually kills or injures an individual GCWA by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering, take via *harm*, as defined in 50 CFR §17.3, may occur. Those potential negative consequences due to construction activity and noise to GCWA attempting to nest in adjacent habitat are not completely understood, but some studies indicate the consequences are minimal (Long et al. 2017a, Long et al. 2017b, Lackey et al. 2012).

In 2008 and 2009, Lackey et al. (2012) exposed GCWAs 88 times to recordings, described as playback surveys, of road construction noises at 80 dB that included back-up warning beepers, excavating, diesel engine noise, loading dump trucks, and human voices. These playback surveys were conducted over two years with 33 playback surveys in 2008, and 55 in 2009. While there was no apparent difference in reproductive success and territory shifts, or higher incidence of territory abandonment, 3 of 33 GCWAs exhibited a behavioral response during 2008 playback surveys and 3 of 55 GCWAs exhibited a behavioral response in 2009 (Lackey et al. 2012). We note GCWAs in the Lackey study were not banded, and discerning identity of GCWA between years was not possible. GCWA behavioral responses included leaving the area immediately upon playing of construction noise and leaving the area after 5 seconds of construction noise. Four of the six GCWA exposed to construction noise and exhibiting a behavioral response were able to successfully fledge young.

Although only six GCWA exhibited a response, we acknowledge a response occurred and the consequences are not well understood. Research indicates GCWA may experience nest success despite exhibiting an initial behavioral response to construction noise (Long et al. 2017a, Long et al. 2017b, Lackey et al. 2012). Maintaining a continuous activity prior to GCWA arrival to suitable habitat adjacent to the cleared ROW is to account for and minimize any potential negative consequences due to construction activity and noise. Based on research, we acknowledge the use of “continuous activity” as a minimization measure may be a conservative approach and we impose it in order to ameliorate any remaining effects to the extent practicable. It provides the best opportunity for GCWA to be exposed to and adapt to construction activity

and noise; thus, allowing for the best chance to successfully nest during PHP construction activities.

Identifying risks to fledglings due to delays or pauses in PHP construction

The likelihood of encountering successfully fledged (young birds that have recently left the nest, but are still being fed by their parents) GCWAs increases further into the breeding season and while construction activities are paused near adjacent delineated GCWA habitat due to project delays. GCWA breeding pairs with successful nests adjacent to the cleared ROW (i.e. nests that have fledglings) have the potential to be impacted by construction activities. Specifically, fledglings may fall out of trees and may find themselves within the cleared ROW as construction activity begins again. This poses a potential risk where a flightless fledgling may inadvertently be killed by construction equipment or personnel. In order to avoid the potential to kill fledglings which may be present in the ROW the Applicant will deploy a Service permitted 10(a)(1)(A) GCWA biological monitor(s) in areas of identified GCWA habitat to ensure there are no fledglings within or immediately adjacent to the ROW in conjunction with construction of the pipeline. Monitors will be deployed in these areas during the breeding season from March 1 to July 31. Upon identifying a GCWA fledgling in the ROW, the biological monitor shall stop work until the situation is resolved and the area is deemed clear of fledglings.

“Continuous Activity” defined

There is no precisely defined standard or level of activity known to be sufficient for habituating GCWA to human activity such that they would not be deterred from nesting adjacent to construction sites once construction begins – especially in light of the studies that indicate that GCWA are not significantly affected by human activity. The purpose of the continuous construction requirement is to minimize the potential for take that may occur as a result of deterring successful breeding activities. At this stage of the season, construction activities are therefore not expected to produce effects that would result in an otherwise prohibited take of GCWA.

Major pipeline activities will work as a moving assembly line beginning with vegetation clearing and is followed by grading, stringing, trenching, bending, welding, non-destructive examination, coating, lowering-in, backfill, tie-ins and cleanup. Major assembly line activities occur in a continuous fashion, within reason, and proceed in a linear direction from a starting point to an end point along the PHP ROW. These major activities generally proceed each other along the ROW, and are expected to experience minor periods of inactivity. A minor period of inactivity is a pause of major construction activity not exceeding a 24-hour period during weather suitable for construction activities between the end of one activity and the beginning of the next. We account for those minor delays associated with transitioning from the end of one major activity to the beginning of the next as “within reason” and shall not exceed a period of 24 hours. These minor delays are largely due to issues associated with logistical challenges of transitioning from a particular major activity location to the next. We also account for those periods of decreased or paused construction activity exceeding those classified as minor delays along the assembly line due to:

1. An activity is outpaced by its preceding activity – Some activities such as vegetation clearing may occur at a much faster rate, and commonly outpace subsequent construction activities in the

assembly line; this creates a period in time where maintaining a continuous major construction activity is not possible.

2. Environmental conditions – An activity may be slowed or paused due to unsafe working conditions caused by extreme weather and may include extended periods of precipitation and other weather extremes that may not allow for maintained continuous major construction activity.

3. Unforeseen construction difficulties – An activity may be slowed or paused due to the discovery of an unforeseen construction difficulty which may be cause for changes to construction plans. This may include any issues encountered during trenching, boring, or directional drilling activities that may require further review.

Any single factor or a combination of the aforementioned factors exceeding those classified as minor delays may result in extended periods of decreased or paused major construction activities. An extended period of inactivity is defined as any pause of major construction activities for a period of 24 hours or more. Paused activity at a given location may exacerbate the amount of time between the transitioning of one major assembly line activity to the next and to following construction locations; thus, the more amount of time passed between major activities the greater the chance GCWA may establish initial nests or attempt reneating in these areas during a period of inactivity. Any GCWA pairs establishing nests in habitat adjacent to the construction ROW during extended periods of inactivity will experience abrupt exposure to follow-on major construction activities when they begin; this may lead to additional stressors on nesting pairs and fledglings that were not afforded the opportunity to adapt to a continual construction presence which should have been there prior to or during their nesting territory establishment. In order to account for these extended periods of reduced or paused activity, Kinder Morgan will ensure a presence is maintained at these locations by driving work trucks along the construction ROW. Kinder Morgan will ensure that trucks will drive and maintain a presence along the construction ROW during peak GCWA activity times as follows:

Areas of the ROW within GCWA habitat will be driven twice a day, and will consist of two passes (a complete pass is one revolution from and back to the starting point). The first driving activity period will begin approximately 30 minutes before sunrise, and the second driving activity period will begin approximately one hour prior to sunset. Maintaining a presence at these times will ensure any GCWA occurring in adjacent habitat are aware of human activity occurring within the construction ROW. Ensuring a ROW presence is maintained during these times allows for greater overlap with GCWA periods of higher activity, and will afford the greatest opportunity for GCWA to identify and adapt to human and vehicle presence. Affording GCWA the best opportunity to become habituated to daily human and vehicle presence will allow for more gradual transition and exposure to additional stressors caused by commencement of major construction activities. If the ROW is too wet or not safe to travel on, these activities will be suspended, and the Service will be immediately notified, until it is safe to resume.

The Service will consider PHP construction activities within or adjacent to GCWA habitat as “continuous” when these guidelines are adhered to. The Service has evaluated PHP’s activity to

date and determined that it has met these requirements. We understand the requirement to maintain continuous activity as described above may not ameliorate all negative consequences to any GCWA nesting in suitable habitat adjacent to the cleared ROW, and the conservation measure (i.e. use of continuous activity) was never meant to be interpreted as such. The use of continuous activity is understood to be a minimization measure meant to reduce the impacts of the authorized taking of GCWA, utilizing GCWA habitat as a surrogate. Therefore, given the use of continuous activity as a conservation measure designed to minimize the impacts of the taking on GCWA, this conservation measure does not increase the amount of authorized take described herein and within the original BO. We do not expect the use of “continuous activity” as a conservation measure to reduce appreciably the likelihood of survival and recovery of the GCWA in the wild.

Enforcement of Oak Wilt Prevention Measures

On March 3, 2020, the Service received a report (herein referred to as the Vaughn Report) documenting an alleged failure by the Applicant to properly apply oak wilt prevention measures as discussed within the GCWA Conservation Measures section of the February 3, 2020, BO, and as mandated by the Reasonable and Prudent Measures and associated Terms and Conditions. Specifically, GCWA Conservation Measure 3 states, “Regardless of season, all trimming cuts or other wounds to oak trees, including freshly-cut stumps and damaged surface roots, will be treated immediately with a wound or latex paint to prevent exposure to contaminated insect vectors.” The Applicant has acknowledged the failure to immediately apply oak wilt treatment to stumps produced within the ROW in some circumstances, and in some cases, wounds to oaks directly adjacent to the construction ROW due to vegetation clearing activities. The Applicant immediately stopped clearing activities, developed a new protocol for addressing these requirements that was satisfactory to the Service, began clearing again only once that protocol was in place, and has since addressed all issues associated with the Vaughn Report. The new protocol is described in the Applicant’s March 11, 2020 and March 22, 2020, “Permian Highway Pipeline Oak Wilt Prevent Requirements (Oak Wilt Requirements, Enclosure 1).

The failure to apply oak wilt prevention measures, potentially, may have resulted in the transmission of the oak wilt fungus, although the likelihood of that occurrence and any impacts on the GCWA is difficult to assess and is more speculative. The Applicant’s Oak Wilt Requirements address measures for areas that may have been affected before clearing was suspended and for areas yet to be cleared. The Oak Wilt Requirements include provisions for monitoring of compliance with oak wound treatment measures and for remediation. The Applicant shall immediately report to the Service any failure to comply with or deviation from the Oak Wilt Requirements with sufficient information and detail such that we may prescribe any and all appropriate remedial measures.

Further, for a period of 180 days from the date of clearing, the Applicant will monitor the project site for evidence of oak wilt on either side of the construction right-of-way in areas of designated GCWA habitat with the assistance of oak wilt control experts (i.e. certified arborists with oak wilt prevention and treatment experience). If oak wilt presents in any monitored areas, where it has not been identified by Applicant using a qualified oak wilt expert as pre-existing, and with landowner permission, the Applicant shall initiate appropriate measures to treat affected areas and limit further spread of the fungus. The Applicant is required to immediately report to the

Service any identified oak wilt as well as the proposed remedial measures and a monitoring report within 72 hours of implementing remedial measures.

In keeping with Reasonable and Prudent Measure 2, and Term and Condition 9, the Applicant has worked with the Service to identify the full extent of the failure to properly apply oak wilt prevention measures within GCWA habitat, not just within the properties mentioned in the Vaughn Report. The Applicant will continue working with the Service to remediate oak wilt infection within a reasonable period of time and to the satisfaction of the Service.

At the time of issuance of this addendum to the February 3, 2020, BO, no additional consequences due to the failure to properly apply oak wilt prevention measures have been detected. The Applicant has purchased additional GCWA conservation credits from a Service approved bank to account for any potential future losses of habitat that may result from the improper implementation of oak wilt conservation measures. If consequences from oak wilt do arise in the future and the impacts exceed the amount of additional mitigation (i.e. purchased credits), the Applicant will reinitiated consultation, properly mitigate for losses to GCWA habitat, and continue to fully implement Oak Wilt Prevention Requirements. The Service has determined the amount of incidental take has not been exceeded as a result of improper oak wilt conservation measure implementation, and has worked with the Applicant to ensure any future potential losses of GCWA habitat due to oak wilt shall be properly mitigated whether or not the oak wilt fungus actually spreads and impacts GCWA habitat. Given the Applicant continues work with and monitor this issue, the Service does not consider the failure of the Applicant to properly implement oak wilt prevention measures a violation of the Reasonable and Prudent Measures and associated Terms and Conditions, and therefore, does not constitute the revocation of incidental take coverage and insulation from Section 9 violations as long as the Applicant diligently continues to rectify any potential issues that may arise. The Applicant acknowledges and accepts responsibility for all consequences that may arise due to improper oak wilt prevention measure application, and additional conservation offsets for any future potential impacts are described below.

Conservation Offsets for Potential Consequences due to Oak Wilt

The Applicant has calculated the amount of potential oak wilt impacts to GCWA habitat due to improper application of the oak wilt prevention measures (See Enclosure 2, April 7, 2020, Additional Offsets for the GCWA to Address the Potential Impacts of Oak Wilt). In an effort to ensure any potential impacts to GCWA habitat is properly addressed the Applicant shall purchase 67 GCWA conservation credits from a Service approved conservation credit bank with an appropriate service area encompassing those locations where potential oak wilt impacts may occur; these 67 credits are specifically to offset potential oak wilt impacts and shall be purchased within 30 days of issuance of this addendum. We also note the Applicants original purchase of 1,363 acres of occupied GCWA habitat (Igau Ranch) would have a remainder of surplus acreage after deducting 1,247.55 acres for destroyed and degraded habitat. A total of 115.45 surplus acres (i.e. additional acres conserved above the total amount of authorized take) remain, and the Service will consider this surplus as available for use for other necessary changes to the PHP that may arise in the future. If total impacts due to oak wilt surpass the purchased amount of 67 credits, the applicant may utilize the remaining balance of 115.45 acres to offset impacts; these surplus credits shall be deducted as new consequences to GCWA habitat are discovered and

accounted for. We also note these credits do not supersede the Applicant's responsibility to fully implement their Oak Wilt Prevention Requirements, and the Applicant must follow the requirements in order to minimize any potential spread of the oak wilt fungus.

AMENDED INCIDENTAL TAKE STATEMENT

The purpose of this amended incidental take statement is to address those changes to the amount of GCWA take within the Corps Action Area and Applicant Action Area. These changes are discussed in the previous addendum to the BO, and are reflected in Table 3 below. These changes to take are specific to the GCWA, and are the result of proposed reroutes at three locations discussed above. All other information within the February 3, 2020, BO and its incidental take statement remain valid, to include any discussion regarding the use of habitat as a surrogate, and all information pertaining to the Houston toad. Changes herein apply only to the amount or extent of take anticipated for the GCWA because Houston toad and Tobusch fishhook cactus do not occur in the proposed reroute areas, proprietary blasting areas, or those areas where oak wilt transmission may have occurred.

AMOUNT OR EXTENT OF TAKE ANTICIPATED

Table 3 (amended). Anticipated take for the GCWA.

Project Area	Amount of Take (acres)	Life Stage when Take is Anticipated	Type of Take	Take is Anticipated as a result of
In USACE Action Area	82.7 acres total loss and 389.2 acres degraded	Adults and juveniles	Harm	Reduction of fitness to individuals by impairing breeding, feeding, and sheltering activities caused by the loss and degradation of habitat.
In Applicant Action Area	199.3 acres total loss and 977.9 acres degraded	Adults and juveniles	Harm	

EFFECT OF THE TAKE

In the Service's February 3, 2020, BO, we determined that the level of anticipated take is not likely to jeopardize the continued existence of the GCWA taking into consideration the status of the species, the degree of impact to the species caused by the proposed pipeline, and considering the conservation measures for the conservation of these species to which the Applicant has committed. In the addendum to the February 3, 2020, BO, we discuss the total amount of degraded GCWA habitat will increase by 14.8 acres. The Service has determined the increase of 14.8 acres of degraded habitat due to PHP reroutes at three locations is not likely to jeopardize the continued existence of the GCWA.

The Service also has determined that Kinder Morgan's lapses in oak wilt treatment, with the corrective action it has taken to date and the additional future commitments it has made regarding oak wilt described above, will not likely jeopardize the continued existence of the GCWA. Taking into account all of the new information that has become available since the February 3, 2020 BO, including the information made available to the Service regarding oak wilt treatment and Kinder Morgan's plans to comply with the continuous construction requirement, the Service has determined that NWP 12 authorization for the PHP is not likely to jeopardize the

continued existence of the GCWA for the reasons stated in this document and the original BO. These reasons include the fact that a relatively small amount of habitat for the GCWA is impacted by the PHP compared to that available to the species, and many of those impacts are temporary and will be minimal once construction is complete. We further note that the Service's original BO was not intended to describe the minimum measures necessary to avoid jeopardy such that any departure by Kinder Morgan from the originally described action or reasonable and prudent measures necessarily means jeopardy is likely to occur. As reflected in this document, the Service now has analyzed the originally proposed action, as modified by the reroutes and subsequent events and with the additional commitments by Kinder Morgan described above, and has determined that NWP 12 authorization for the PHP as modified is not likely to jeopardize the GCWA. We do not expect any additional impacts to the Houston toad or Tobusch fishhook cactus as a result of the changes and activities described in the addendum to the BO.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize incidental take of the GCWA. These reasonable and prudent measures apply only to those activities discussed within the Addendum to the Biological Opinion. All reasonable and prudent measures associated with the February 3, 2020, BO and accompanying Incidental Take Statement remain valid. We further note that the purpose and objective of such reasonable and prudent measures is not to identify the minimum measures necessary to avoid jeopardy; to the contrary, the purpose of the reasonable and prudent measures is to minimize or lower the amount of incidental take, potentially below the level expected from the action that has been found not to cause jeopardy.

1. USACE shall minimize harm of the GCWA during activities associated with their authorization of the PHP.
2. The Applicant shall minimize the impacts, i.e. the amount or extent of incidental take, to the GCWA, during activities associated with the construction and operation of the PHP to include any oak wilt fungus spread resulting from improper implementation of oak wilt fungus measures.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, USACE and/or the Applicant, as applicable, must comply with the following terms and conditions that implement the reasonable and prudent measure described above and outlined in reporting/monitoring requirements. The Corps and/or the Applicant, as applicable, must implement the terms and conditions for all project activities in the USACE Action Area, while the Applicant has responsibility for implementing the terms and conditions for all project activities in the Applicant Action Area. These terms and conditions are non-discretionary. The following terms and conditions implement reasonable and prudent measure 1:

1. All personnel involved in any authorized activity covered by the Addendum to the February 3, 2020, biological opinion shall be informed of these terms and conditions prior to the implementation of the authorized activity.

2. Within GCWA habitat in USACE Action Area, vegetation clearing shall not occur from March 1, 2020 to July 31, 2020. Vegetation clearing within GCWA habitat areas within defined project workspaces shall occur and must be completed from August 1, 2020, to February 28, 2021.
3. Within GCWA habitat in USACE Action area, temporary fill, construction material, or other debris shall be removed immediately after completion of activities covered by the Addendum to the February 3, 2020, BO that result in alteration of GCWA habitat.
4. The USACE shall comply with the reasonable and prudent measures described above and the required reporting and monitoring requirements below to ensure the amount of authorized take is not exceeded.

The following terms and conditions implement reasonable and prudent measure 2:

1. All personnel implementing the Applicant's authorized activity covered by the Addendum to the February 3, 2020, BO shall be informed of these terms and conditions prior to the implementation of the authorized activity.
2. Within GCWA habitat occurring in the Applicant Action Area, vegetation clearing shall not occur from March 1, 2020 through July 31, 2020. Vegetation clearing within defined project workspaces shall occur and must be completed from August 1, 2020, to February 28, 2021.
3. Within the Applicant Action Area, temporary fill, construction material, or other debris shall be removed immediately after completion of activities covered by the Addendum to the February 3, 2020, BO that result in alteration of GCWA habitat.
4. The Applicant shall fully implement the March 22, 2020, Oak Wilt Prevention Requirements.
5. The Applicant shall purchase 67 GCWA conservation credits for potential impacts to GCWA habitat due to the potential spread of the oak wilt fungus. Conservation credits shall be purchase from a Service approved bank with an appropriate service area within 30 days of issuance of this addendum to the February 3, 2020, BO.
6. The Applicant shall comply with the reasonable and prudent measures described above and the required reporting and monitoring requirements below to ensure the amount of authorized incidental take is not exceeded and to further minimize the take.
7. Any failure by the Applicant to comply with the terms and conditions stated herein may result in loss of Section 9 take coverage for the PHP, if not remedied within a reasonable period of time to the satisfaction of the Service. Any efforts to identify and coordinate any remediation efforts with the Service shall occur as soon as possible, but shall not exceed a period of 48 hours.

MONITORING AND REPORTING REQUIREMENTS

Upon locating a dead, injured, or sick GCWA, prompt notification must be made to the nearest Service Law Enforcement Office (San Antonio, TX; telephone: 210-681-8419), the Austin Ecological Services Field Office (telephone: 512-490-0057), and the Texas Coastal Ecological Services Field Office (telephone: 281-286-8282). Care should be taken in handling sick or injured specimens to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered specimens or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed. The Service shall be notified within five business days upon 1) the clearing of GCWA habitat associated with the three locations discussed within the Addendum, and 2) the completion of project construction at the three locations. The Applicant shall inform the Service immediately upon knowing any conservation measures, reasonable and prudent measures, and terms and conditions within this Addendum and the February 3, 2020, BO are not implemented to the fullest extent at any time during project implementation. Within 30 business days after completion of the project (pipeline is operational), the applicant shall include, 1) a summary report of all successfully implemented conservation measures, and 2) a summary report of conservation measures that were that were not implemented in accordance with this addendum and the Reasonable and Prudent Measures in the February 3, 2020, BO and all actions taken to remedy any failure to fully implement all conservation measures and Reasonable and Prudent Measures associated with all facets of this formal section 7 consultation.

REINITIATION NOTICE

This concludes the reinitiation of formal consultation for the PHP within the Corps' Fort Worth District (SWF-2018-00227). As provided in 50 CFR Sec 402.16, reinitiation of consultation is required and shall be requested by the federal agency or by the Service, where discretionary federal involvement or control over the action has been retained or is authorized by law and: (1) if the amount or extent of incidental taking specified in the incidental take statement is exceeded; (2) if new information reveals effects of the action that may affect listed species or designated critical habitat in a manner or an extent not previously considered; (3) if the identified action is subsequently modified in a manner that causes an effect to the listed species or designated critical habitat not considered in the biological opinion or written concurrence; or (4) if a new species is listed or designated critical habitat that may be affected by the identified action.

If you have questions regarding this addendum to the PHP BO or amended ITS, please contact Jacob Ogdee, at 512-490-0057, ext. 243, or at jacob_ogdee@fws.gov.

Sincerely,

Adam Zerrenner
Field Supervisor

LITERATURE CITED

- Lackey, M. A., M. L. Morrison, Z. G. Loman, B. A. Collier, and R. Neal. 2012. Experimental Determination of the Response of Golden-Cheeked Warblers (*Setophaga chrysoparia*) to Road Construction Noise. *Ornithological Monographs* 74:91
- Long, A. M., M. R. Colon, J. L. Bosman, D. H. Robinson, H. L. Pruett, T. M. McFarland, H. A. Mathewson, J. M. Szewczak, J. C. Newnam, and M. L. Morrison. 2017a. Effects of Road Construction Noise on Golden-Cheeked Warblers: An Update. *Wildlife Society Bulletin* 41:240 – 248.
- Long, A. M., M. R. Colon, J. L. Bosman, D. H. Robinson, H. L. Pruett, T. M. McFarland, H. A. Mathewson, J. M. Szewczak, J. C. Newnam, and M. L. Morrison. 2017b. A before-after control-impact assessment to understand the potential impacts of highway construction noise and activity on an endangered songbird. *Ecology and Evolution* 7:379 – 389.

Enclosure 1

**Permian Highway Pipeline
Oak Wilt Prevention Requirements
– Version 2 March 22, 2020**

These Oak Wilt Prevention Requirements (Requirements) are established by PHP in order to implement the terms of the U.S. Fish and Wildlife Service’s Biological Opinion and Incidental Take Statement and U.S. Army Corps of Engineers NWP 12 verification with respect to work for the Pipeline in the four counties listed below. These Requirements are to be strictly performed, complied with, and enforced by all relevant personnel, whether those persons are PHP employees, contractors, subcontractors, or agents, representatives, employees or laborers of any of the above. Any and all questions of any nature relating to these Requirements should be addressed immediately to Scott Long or his official designee.

Application:

1. These Requirements apply to any and all work performed in Kimble, Gillespie, Blanco, and Hays Counties without exception.
2. These Requirements apply to all varieties of oak trees. Oak wilt treatment does not apply to other trees, such as Ashe juniper, mesquite, etc. If there is any doubt as to whether a wounded tree is an oak or some other variety, the wounds shall be treated as per these Requirements.
3. This Requirements document shall be available on the ROW for field reference by all crews at all times.

Training:

1. All persons working on or adjacent to the ROW in the subject counties must be trained to identify and treat oak wounds pursuant to these Requirements prior to the resumption of clearing activities in the subject counties.
2. As new crews/personnel are on-boarded, they shall be similarly trained prior to performing work on the ROW in the subject counties.
3. All oak wilt training will include presentation and discussion of these Requirements.
4. All training sessions will be documented. The documentation shall include at least the following information: (i) date of training, (ii) place, (iii) subject matter(s), (iv) documents presented (if any), (v) trainer(s) and (vi) attendees. All persons attending the training sessions must sign in. These Requirements shall be made available to, and discussed with all persons who attend each training session.

Methods

There will be two Oak Wilt Prevention methods used on the PHP project – an “Edge Trenching Method” and a “Painting Method”. Both methods are effective ways to prevent the spread of oak wilt. The “Painting Method” is used when the “Edge Trenching Method” is not used or there are oak wounds outside of the limits of the edge trench.

Edge Trenching Method

Edge Trenching Method is used to break the root connections between groups of oak trees. Breaking the root connections will isolate a potentially affected area and thereby stop the transmission of fungus to an unaffected area. The technique used to break root connections is trenching approximately 4 feet deep with equipment such as rock saws, ripper bars, trenchers or other appropriate equipment.

1. The full width of the right-of-way (ROW) will be cleared utilizing conventional clearing methods.
2. Trees cleared within the ROW will be chipped and mulched
3. During clearing activities, trees along the edge of the ROW will be limbed by a chain saw, hand saw or other pruning device so as to avoid breaking the limbs.
4. Disinfect all hand saws and hand cutters/loppers at the beginning of each shift and after each oak tree cut/pruned using denatured methyl alcohol (shellac thinner), isopropyl alcohol, or a general purpose household disinfectant such as Lysol, Listerine, Pine-Sol or related products.
5. Either prior to or within 24 hours of clearing, a trench will be cut along both sides of the ROW in areas where living oak trees are present. The trench will be backfilled within 1 hour.
 - A. When moving away from areas where living oak trees are present into areas with no living oak trees, the length that the edge trench has to extend out from the trunk of the last living oak tree will be determined using one of the two following methods. Either method is acceptable.
 - a) Method 1: The edge trench shall extend out 25-feet past the last ½-inch diameter root uncovered in the edge trench, but in no case less than 100-feet from the trunk of the last living oak tree. If ½-inch diameter tree roots are continuing to be encountered in the edge trench beyond 175-feet from the last living oak because of other trees in the area, the edge trench shall extend a maximum of 200-feet from the trunk of the nearest living oak tree before stopping.
 - b) Method 2 (Alternative): Measure the size of the canopy of the

living oak tree. The edge trench shall extend out approximately 4 times (4x) the radius of the canopy from the trunk of the tree.

- B. In areas where living oak trees are present and consolidated rock is not present, the edge trench will be 4-feet deep.
 - C. In areas where living oak trees are present and consolidated rock is encountered at a depth of less than 4-feet below the surface, the edge trench will be cut to a depth that ensures oak roots at or above the consolidated rock are severed.
7. Requirements for the “Painting Method” will apply to areas that will be outside of the edge trench, including limbed trees along the edge of the ROW.
 8. The edge trench will be installed using a trenching machine, rock saw, ripper bar, or backhoe or other appropriate equipment.
 9. When changing methods from the “Edge Trenching Method” to the “Painting Method”, or from the “Painting Method” to the “Edge Trenching Method”, a trench will be cut across the ROW to connect the two edge trenches.

Painting Method

Clearing/Trimming/Wounding Oaks

1. Clearing and other work should be performed so as to avoid damage to trees outside of the ROW and work areas where possible.
2. Trees along the limits of disturbance (LOD) shall be limbed with a chain saw, hand saw or other pruning device so as to avoid breaking the limbs. Breaking the limbs makes painting the wound more difficult and may result in broken limbs outside of the LOD. Broken limbs shall be trimmed so as to allow for proper wound treatment.
3. If you break a limb outside LOD, prune and repair the broken limbs (typically with a clean cut) to limit surface area exposure. Also, let the land agent know to inform the landowner of damage outside of the LOD.
4. Any wound to an oak tree no matter how small must receive treatment per these Requirements—no exceptions.
5. Limit edge of LOD limbing and branch breakage to minimize treatment requirements; treat any and all wounds to oak trees that may result from PHP activities per these Requirements—no exceptions.

Wound Treatment

1. A wound is any place where the oak tree has been cut or damaged such that bark has been removed and the wood is exposed. A wound can result from cutting the tree or a limb of the tree, breaking a limb, or contact with the tree that removes bark regardless of whether a limb is broken as a result of the contact.
2. Except as stated herein, all wounds must be treated. This mandate includes but is not limited to stumps, surface roots, damages to trunks, cut limbs, pruned limbs and broken limbs regardless of how high in the canopy. In the event a wound results from a tear such as a broken limb caused by a vehicle strike, the tree should be pruned so as to create a flat wound surface and then treated.
3. Paint all wounds and fresh stumps as soon as it is safe to do so. You must paint the entire wound. It is best if wounds are painted immediately after they are created. In all events, wounds on trees, including stumps that will not be mulched or removed during the clearing process must be painted within 1 hour of having been made.
4. Wounds on trees that will be removed as part of the clearing process must be mulched and covered, or painted within 4 hours of being made. Paint all stumps within the ROW unless it is certain the stump will be mulched below ground level and covered within 4 hours of having been cut. If there is any doubt as to whether the stump will be mulched and covered within the time frame specified herein it must be painted within 1 hour.
5. Damage to exposed roots is a wound. Paint damage to exposed roots.
6. Paint shall be used to treat wounds. Any type of paint is acceptable. Pruning sealer may be used to treat wounds. Make sure the application adheres to, and completely covers the wound.
7. Dedicated painters shall be staffed to maintain pace with each piece of equipment associated with clearing and grading activities.
8. Painters shall be staffed to maintain pace with any worker or crew operating equipment dedicated to clearing and/or grading (i.e. grubbers, dozers, etc.) or which may cause breakage (i.e., fencing and survey crews, and inspectors operating motor vehicles on the ROW).
9. Any crew working in or adjacent to the ROW shall be assigned a painter or painting crew.
10. This general protocol must be employed whenever it is safe and feasible to do so. If it is not safe or feasible to treat a wound (or wounds) as specified by these Requirements, the crews shall consult an oak wilt inspector and a designated oak wilt specialist for further instruction.

Disinfectant Treatment

1. Disinfect all hand saws and hand cutters/loppers at the beginning of each shift and after each oak tree cut/pruned using denatured methyl alcohol (shellac thinner), isopropyl alcohol, or a general purpose household disinfectant such as Lysol, Listerine, Pine-Sol or related products.
2. Do not spray tree wounds with disinfectant as the disinfectant is for the equipment.

Inspection – Applies to both Methods

1. KM will engage oak wilt inspectors (OWI) to monitor compliance with these Requirements. OWIs will report to their assigned manager. To be clear, OWIs have stop work authority.
2. One OWI will be assigned to every two pieces of clearing equipment in “Painting Method” areas provided line of sight with both pieces of equipment can be maintained.
3. One OWI will be assigned to every two pieces of trenching equipment and clearing equipment that will perform clearing along the edge of the ROW in “Edge Trenching Method” areas, provided line of sight with both pieces of equipment can be maintained.
4. OWI’s have responsibility to assure painting is completed in compliance with this document.
5. OWIs will document the beginning and ending station numbers of painting and/or trenching for each day and will document that all wounds have been painted.
6. OWIs will document on their daily reports that they have inspected the trees and either did not see any unpainted wounds or, when appropriate, that the OWIs located an untreated wound and ensured it was painted.
7. OWIs will take representative pictures documenting treated wounds on every property.

Survey

1. All survey crews will carry paint and/or pruning sealer, and applicators such as paint brushes to treat any wounds that occur during the survey process as soon as possible. In all events, wounds on trees created during the survey process must be painted within 1 hour of being made. Survey crews shall disinfect all hand saws and hand cutters/loppers at the beginning of each shift and after each oak tree cut/pruned using denatured methyl alcohol (shellac thinner), isopropyl alcohol, or a general purpose household disinfectant such as Lysol, Listerine, Pine-Sol or related products.
2. A survey inspector shall be assigned to monitor all survey crews to ensure compliance with these Requirements. To be clear, survey inspectors have stop work authority.

Landowner Complaints

1. Any landowner complaint received that claims divergence from mitigation measure must be documented and addressed as soon as possible:
 - A. Time and method of complaint; i.e., phone call, email, etc.
 - B. Name of complainant
 - C. Name of person taking the complaint
 - D. Tract(s) affected
 - E. GPS of area of concern (if applicable)
 - F. Person(s) responding to the area of concern
 - G. Time resolved & method
 - H. Before/After pictures
 - I. Immediately transmit complaint to PM, CM, Chief and Lead Land

Compliance with these Requirements

1. Compliance with these Requirements is mandatory without exception. Failure to comply fully with these Requirements shall have serious consequences, up to and including, termination of contract and/or employment, as applicable.
2. PHP management personnel including Scott Long shall have the right without prior notice, and at any and all times, to inspect and audit all aspects of performance of and compliance with these Requirements. All management directives relative to these requirements shall be performed and complied with immediately. These Requirements are the property of PHP and shall be considered to have been incorporated into the applicable terms and conditions of contract and employment, where applicable, as if fully set forth therein.
3. These Requirements are subject to change at any time upon notice by PHP. All such changes shall be deemed binding and effective as and when issued by PHP.

Enclosure 2

Additional Offsets for the Golden-cheeked Warbler to Address the Potential Impacts of Oak Wilt, April 7, 2020

Background

Permian Highway Pipeline LLC (PHP) applied to the U.S. Army Corps of Engineers (Corps) for verification that regulated discharges of dredged or fill material into waters of the United States associated with the construction of the Permian Highway Pipeline (Pipeline) were authorized under the Corps' Nationwide Permit 12 for Utility Lines. This application triggered an interagency consultation between the Corps' and the U.S. Fish and Wildlife Service (Service) under section 7 of the Endangered Species Act. The Corps and PHP prepared a Biological Assessment in August 2019 that the Corps submitted to the Service on September 18, 2019 (Corps Fort Worth District) and on September 24, 2019 (Corps Galveston District) with requests to begin formal consultation. The Biological Assessment acknowledged that adverse effects to the endangered golden-cheeked warbler (*Setophaga chrysoparia*; GCWA) were likely and PHP committed to implement certain conservation measures benefitting the GCWA as part of its project to construct and operate the Pipeline.

Among the conservation measures committed by PHP were actions to prevent the spread of oak wilt. These oak wilt prevention measures stated (see page 7 of the Biological Assessment):

The Applicant will direct its contractors to follow the Texas Forest Service or professional arborist's guidelines for the prevention of oak wilt within Project Workspaces in Kimble, Gillespie, Blanco, and Hays Counties. The Applicant will avoid, to the extent practicable, wounding (e.g., cutting, trimming, limbing, and pruning) oak trees from February through June. The least-hazardous periods for trimming are during the coldest days in midwinter and extended hot periods in mid- to late summer. Regardless of season, all trimming cuts or other wounds to oak trees, including freshly-cut stumps and damaged surface roots, will be treated immediately with a wound or latex paint to prevent exposure to contaminated insect vectors.

The Biological Assessment anticipated the benefit of this conservation measure (see page 7 of the Biological Assessment):

Implementing oak wilt prevention guidance within the range of the GCWA would minimize the likelihood of indirect loss or damage to potential GCWA habitat in the vicinity of the Project Workspaces that may be attributable to the introduction or spread of the oak wilt fungus.

The Service incorporated this and other conservation measures into its Biological Opinion issued to the Corps on February 3, 2020, and relied on these conservation measures to evaluate the effects of the Corps' verification action. The Service made mandatory the full implementation of all conservation measures described in the Biological Assessment as terms and conditions of the Incidental Take Statement included with the Biological Opinion (see

pages 55 and 56 of the Biological Opinion).

Furthermore, the Service required reinitiation of consultation “where discretionary federal involvement or control of the action has been retained or is authorized by law and: (1) if the amount or extent of incidental taking specified in the incidental take statement is exceeded; (2) if new information reveals effects of the action that may affect listed species or designated critical habitat in a manner or an extent not previously considered; (3) if the identified action is subsequently modified in a manner that causes an effect to the listed species or designated critical habitat not considered in the biological opinion or written concurrence; or (4) if a new species is listed or designated critical habitat that may be affected by the identified action” (see page 58 of the Biological Opinion).

PHP and its contractors are alleged to have failed to implement in full the oak wilt conservation measures described in the Biological Assessment and required through the terms and conditions of the Incidental Take Statement. Some wounds on oak trees caused during clearing for Pipeline construction were not immediately treated with a wound or latex paint to prevent exposure to contaminated insect vectors.

As PHP previously described to the Service on March 25, 2020:

Attached for your information and review is a revised version of the Oak Wilt Prevention Requirements [dated March 22, 2020]. We have been working with credentialed arborists and other environmental experts from Davey to refine our construction activities to prevent the potential spread of oak wilt and we will continue to do so going forward. We made a few revisions to the Requirements to incorporate those refinements and to clarify what we expect from all of our employees, contractors and subcontractors. PHP is committed to preventing oak wilt and to that end, PHP trained everyone working in Blanco, Gillespie, Hays and Kimble counties on the importance of strict compliance with the Requirements before PHP resumed clearing activities in those counties; and PHP has taken steps to make sure that training is reinforced daily. As you know, PHP stopped clearing activities in those counties on March 4, 2020, in order to revise its approach to implementation of oak wilt prevention measures. PHP began clearing activities again on March 13, 2020, subject to the significantly more robust measures outlined in the first version of the Oak Wilt Prevention Requirements initially discussed with you at our meeting on March 5, 2020, and submitted to you on March 13, 2020. To be clear, the attached refinement adds additional details to the approach in the field based on initial implementation experience but does not indicate any problems with the approach that was in place on March 13.

The Service has also imposed additional offsets for the GCWA to address potential impacts to GCWA habitat that may arise from any new oak wilt infection centers created during clearing of vegetation in advance Pipeline construction. This is in addition to new on-site remedial efforts should any new oak wilt infection centers be identified. The Service has reinitiated consultation for PHP’s Pipeline project, in part to address some minor route adjustments to accommodate relevant landowners, and will incorporate both the Requirements and the required additional offset into a revised Biological Opinion.

Oak Wilt Disease

Oak wilt is a disease affecting oak trees (those of the genus *Quercus*) caused by a fungus (*Ceratocystis fagacearum*) that attacks the vascular system of infected trees (Juzwik et al. 2011). Species in the group of “red oaks,” including Spanish oak (*Q. buckleyi*), Shumard oak (*Q. shumardii*), and blackjack oak (*Q. marilandica*), are known to be highly susceptible to the fungus and, once infected, quickly die of the disease—generally within 4 to 6 weeks of infection (Appel et al. 2020). Species in the group of “whiteoaks,” including post oak (*Q. stellata*), bur oak (*Q. macrocarpa*), and chinkapin oak (*Q. muehlenbergii*), are less likely to show signs of the disease (Appel et al. 2020). Fewer of these white oaks die from oak wilt (Appel et al. 2020). Species in the group of “live oaks,” including *Q. fusiformis* and *Q. virginiana*, are intermediate in response to the oak wilt disease. Most live oaks infected with oak wilt typically die from the disease within 3 to 6 months following infection, but some individuals may be resistant to the disease (Appel et al. 2020).

Red oak trees infected by the oak wilt fungus may develop fungal mats between the bark and wood of the tree (Juzwik et al. 2011). These fungal mats generally develop in the spring on red oak trees that succumbed to oak wilt disease during the previous late summer or fall (Appel et al. 2020). Red oak trees affected by oak wilt in the late spring and early summer do not typically form fungal mats (Appel et al. 2020). White oaks and live oaks do not form oak wilt fungal mats (Appel et al. 2020). The fungal mats have an odor that is attractive to certain insects, including species of sap-feeding nitidulid beetles (Appel et al. 2020). These nitidulid beetles may carry spores of the oak wilt fungus from red oaks that have produced fungal mats to other oak trees. An oak tree with a fresh wound that exposes the wood beneath the bark exudes sap that attracts nitidulid beetles. When a beetle that carries oak wilt fungal spores lands on a fresh wound (generally less than 72 hours old), it can transmit the fungus to the wounded tree and spread the disease (Juzwik et al. 2011). Various studies have reported the rate of contamination among nitidulid beetles, with a rate of 83% rate of contamination at a site in Texas during February 2005 and less than 3% contamination at the same site in March and early April 2006 (Hayslett et al. 2009).

An experiment by Camilli and others published in 2007 found that the rate of oak wilt infection in Texas live oak trees where oak wilt fungal spores were applied directly onto fresh wounds varied from 20% (when wound paint was applied to the wound prior to exposure) and 70% (when a spore-containing solution was applied with a dropper into a puncture wound at the base of the tree) (Camilli et al. 2007). The infection rate was 40% to 60% for treatments where the spore-containing solution was painted onto a fresh (10-minute-old) pruning cut (Camilli et al. 2007).

Live oak trees do not form fungal mats and, therefore, do not initiate aboveground spread of the oak wilt disease. However, live oak trees can receive infection from contaminated nitidulid beetles attracted to the sap from fresh wounds. Live oak trees spread the oak wilt disease below ground through an interconnected root system shared with nearby oak trees (Juzwik et al. 2011; Appel et al. 2020). The rate of spread through the root system of live oaks varies from 0 to 150 feet per year, with an average rate of 75 feet per year (Appel et al. 2020).

Golden-cheeked Warbler Habitat

Golden-cheeked warblers use woodlands that are composed of a mix of Ashe juniper trees

(*Juniperus ashei*; an evergreen tree) and oak trees (which are deciduous trees) (Groce et al. 2010). Other deciduous tree species, such as ash, elm, hackberry, and walnut, are also often present in these woodlands (Groce et al. 2010; Ladd and Gass 1999). Golden-cheeked warblers use woodlands that have between 10% and 90% percent canopy cover from Ashe juniper (Campbell 2003), with the remainder of the canopy created by deciduous trees. Studies have not shown a consistent relationship between the relative proportion of oak trees in woodlands used by GCWA and rates of occupancy or reproductive success that are indicators of habitat quality (Groce et al. 2010). Ashe juniper is the most important tree species for GCWA, as all nests of this species contain strips of Ashe juniper bark (Campbell 2003). Live oaks and Spanish oaks are often the most common deciduous trees in GCWA habitat located in the central part of the breeding range, such as in Blanco and Hays Counties (Ladd and Gass 1999). These oak trees are important for foraging by GCWA, since they support habitat for the insects that GCWA eat, and GCWA often forage more frequently in oak trees early in the breeding season (Campbell 2003; Marshall et al. 2013). Woodlands used by GCWA during the breeding season typically have a total canopy cover of at least 35%, but canopy cover of at least 50% is representative of high-quality habitat (Campbell 2003). More recently, GCWAs have been detected nesting successfully in woodlands with as little as 17% total canopy cover and 3% representation by oak trees (Klassen et al. 2012).

Potential Impacts to Golden-cheeked Warblers

Oak wilt disease kills red oaks and most live oaks that become infected by the fungus. The loss of these trees affects GCWA habitat in two ways. First, oak wilt reduces the overall amount of canopy cover in the woodlands used by GCWAs. Second, oak wilt changes the composition of the remaining canopy cover by reducing the proportion of deciduous canopy and increasing the proportion of evergreen canopy. Both types of effects can reduce the suitability of woodlands to function as GCWA habitat. This potential reduction in habitat suitability can make affected areas less likely to be occupied by GCWAs (Magness et al. 2006; Morrison et al. 2010), can reduce the resources available to GCWAs that remain in affected habitat and result in larger territories and lower densities (see discussion in Marshall et al. 2013), can create opportunities for the introduction of edge effects when new gaps are created in otherwise relatively closed canopy woodlands (Service 2014), or a combination thereof. Stewart et al. (2014) found that GCWA did not completely avoid patches of habitat containing oak wilt infections, but state that their findings suggest oak wilt negatively affects habitat selection and the quality of GCWA habitat by reducing the proportion of oak in the canopy.

Baseline Conditions for Oak Wilt Presence and Golden-cheeked Warbler Habitat

Oak Wilt

Oak wilt is present across most of central Texas, including Kimble, Gillespie, Blanco, and Hays Counties that are crossed by the Pipeline within the breeding range of the GCWA (Appel et al. 2020). The Blair Report includes a map of oak wilt infection centers mapped by the Texas Forest Service within Kimble, Gillespie, Blanco, Hays, Kerr, Kendall, and Comal Counties. While the Blair Report does not analyze the actual route or ROW of the Pipeline, the Blair Report asserts that the Pipeline route would cross 44 confirmed oak wilt infection centers mapped by the Texas Forest Service and is in the vicinity of more than 400 oak wilt centers. PHP does not have a copy of the unpublished Texas Forest Service oak wilt dataset as was not

able to determine the actual overlap of the Pipeline with these previously mapped oak wilt infection centers. Furthermore, the time period of the data included in the Texas Forest Service mapping is not reported and it is possible that more oak wilt infection centers may presently occur in the vicinity of the Pipeline or that the size of previously mapped oak wilt infection centers has increased since the data were created. As noted in the Blair Report, Stewart (in her 2012 Master's Thesis, not in Stewart et al. 2014) predicted that the extent of oak wilt infection would double between 2008 (the time period of the study and 2018) (Stewart 2012). In any case, it is likely that the PHP crosses or is in close proximity to many previously mapped oak wilt infection centers and it is clear that oak wilt disease was present and spreading in the vicinity of the PHP before clearing activities began.

Golden-cheeked Warbler Habitat

The degree to which the woodlands in proximity to the Pipeline are actually occupied by GCWAs is not fully understood. Groce et al. (2010), prepared for the USFWS to support the 2014 5-year status review, is the most current and comprehensive compilation of GCWA occurrence data and indicates GCWA occurrence in each of Kimble, Gillespie, Blanco, and Hays Counties. On the basis of this information, PHP acknowledged in the Biological Assessment that suitable GCWA habitat in the vicinity of the PHP could be used seasonally by the species for breeding, feeding, or sheltering activities. Without actual field data on GCWA use of the approximately 1,634 acres of suitable habitat mapped by SWCA Environmental Consultants within 300 feet of the Pipeline ROW (i.e., the limits of construction activity, including temporary and permanent ROWs), PHP conservatively assumed that all such habitat was seasonally occupied by GCWA.

However, this assumption is likely to be an overestimate of the degree to which areas of suitable GCWA habitat are seasonally used by members of the species. Morrison et al. (2010) documents the methods and results of a range-wide habitat modeling effort. The Morrison model provides the most explicit predictions of habitat occupancy among the available habitat models. The Morrison model predicts that between 33% and 55% of the suitable GCWA habitat present within the group of 13 counties associated with a modified version of the GCWA Recovery Regions that contain Kimble, Gillespie, Blanco, and Hays County has a probability of occupancy less than 60%. It is highly unlikely that all suitable GCWA habitat in the vicinity of the PHP is used by the species. The Blair Report included information on GCWA detections in the vicinity of the Pipeline. However, the source of these detections was not reported and the date of observation, precision of the location, survey methodology (if any), and observer name or qualifications are unknown. As described in the Aurora Declaration, some of the GCWA detections included in the Blair Report are clearly questionable and the reliability of the information in the Blair Report on GCWA detections is suspect. Therefore, the information on GCWA detections in the Blair Report provide little additional reliable information on the occupancy status of suitable GCWA habitat in the vicinity of the Pipeline.

Proposed Offsets for Oak Wilt Impacts

With implementation of the Requirements, PHP has created and enacted significant new procedures for addressing the threat of oak wilt associated with vegetation clearing for Pipeline construction in Kimble, Gillespie, Blanco, and Hays Counties (i.e., the counties crossed by the Pipeline within the breeding range of the GCWA). In response to the Service's requirements,

PHP has also secured additional offsets for potential impacts to the GCWA that may arise from its incomplete compliance with oak wilt prevention measures specified in the original Biological Opinion.

Expanded Oak Wilt Prevention Procedures

PHP issued detailed instructions (dated March 22, 2020) for implementing the oak wilt prevention measures required by the terms and conditions of the Incidental Take Statement (the “Requirements”). These Requirements are to be strictly performed, complied with, and enforced by all relevant personnel, whether those persons are PHP employees, contractors, subcontractors, or agents, representatives, employees or laborers of any of the above. The Requirements provide new detail regarding applicability, training, methods, inspections, surveys, and procedures for addressing landowner concerns.

The Requirements identify two methods for preventing the spread of oak wilt: edge trenching to address potential spread of oak wilt via the root system and wound painting to minimize the creation of new oak wilt centers via insect transmission. The new edge trenching method is intended to minimize the spread of oak wilt through the root systems of oak trees within the Pipeline ROW that were damaged or removed during clearing with wounds or stumps that were not immediately painted. It is possible that contaminated nitidulid beetles spread (or may spread) the oak wilt fungus to the remains of such trees before the stumps were ground and covered with soil or the wounds naturally sealed (i.e., generally 72 hours after damage). Trenching to sever the interconnected root systems of oak trees can be an effective means of limiting the spread of the disease among live oak trees (Appel et al. 2020). The Requirements also provide substantial new detail for implementing wound painting that address best practices for clearing, trimming, or wounding oaks and how to apply wound treatments when an oak has been wounded. Under both methods, the Requirements describe the time periods wherein action is required (such as “wounds on trees that will be removed as part of the clearing process much be mulched and covered, or painted within 4 hours of being made”). Furthermore, the Requirements specify how equipment is to be disinfected to meet the terms and conditions of the Incidental Take Statement.

In addition to the Requirements, PHP will monitor for the emergence of new oak wilt infection centers immediately adjacent to the Pipeline ROW and, where landowner permission is obtained for activities outside of the Pipeline ROW, take measures to prevent further spread. Specifically, PHP commits to the following:

The Requirements include provisions for multi-layered monitoring of compliance with oak wilt prevention protocols. PHP shall immediately report to the Service any failure to comply with or deviation from the Requirements with sufficient information and detail such that the Service can prescribe any and all appropriate remedial and/or mitigative measures. In addition to the foregoing, for a period of 180 days from the date of clearing, PHP will monitor from the Pipeline ROW for evidence of oak wilt disease on either side of the Pipeline ROW in areas of GCWA habitat (as mapped in the Biological Assessment) with the assistance of oak wilt control experts. If oak wilt disease presents in any of those areas, where it has not been identified by PHP using a qualified oak wilt expert as pre-existing, and with landowner permission, PHP shall initiate appropriate

measures to treat affected areas and limit further spread. PHP is obligated to use best practices in consultation with an oak wilt control expert for such remediation. PHP will immediately report to the Service any identified oak wilt infection centers as well as the proposed remedial measures.

Additional GCWA Offsets for Potential Oak Wilt Impacts

The Service has directed PHP to secure additional offsets for impacts to the GCWA that may arise from the unintentional spread of oak wilt associated with prior failures to timely paint oak wounds as required by the Incidental Take Statement prior to the Requirements.

However, in light of the discussion above regarding oak wilt and the GCWA, it is not certain the degree to which, if at all, PHP's activities have created a new oak wilt center or that a new oak wilt center (if created) would affect woodlands actually used by GCWAs during the breeding season in ways that result in incidental take beyond that already evaluated in the Biological Opinion.

Amount of Offset

PHP calculated the amount of suitable GCWA habitat, previously mapped by SWCA Environmental Consultants and described in the Biological Assessment that occurred adjacent to and within 30 feet of the Pipeline ROW. This 30-foot distance is a rough approximation of the diameter of the canopy crown of a single plateau live oak tree (*Q. fusiformis*; see "Tree Characteristics" provided by the Urban Forest Ecosystems Institute at <https://selectree.calpoly.edu/tree-detail/quercus-fusiformis>). This additional impact distance assumes that: 1) the canopy along the edge of the Pipeline ROW is composed entirely of oak trees; 2) each oak tree at the edge of the Pipeline ROW has become infected through an unpainted wound or through the root system of an infected oak tree within the Pipeline ROW; and 3) all of these assumed-infected trees lose their foliage and die within the next 3 to 6 months. Approximately 133.5 acres of suitable GCWA habitat occurs within this 30-foot-wide zone.

These are reasonable assumptions for estimating the extent of additional oak wilt impacts on the GCWA, because there is no evidence at this time, and substantial uncertainty whether, a new oak wilt infection has in fact been created by the delayed implementation of wound painting that occurred prior to the Requirements. The assumptions are conservative with respect to predicting impacts:

1. The approach assumes that all suitable GCWA habitat adjacent to the Pipeline ROW is used by the species. However, Morrison et al. (2010) predicts that between 33% and 55% of GCWA habitat in the region has less than 60% probability of occupancy during the breeding season. It is unlikely that all suitable GCWA habitat adjacent to the Pipeline ROW is seasonally occupied by the GCWA.
2. The approach assumes that all canopy within 30 feet of the edge of the Pipeline ROW is oak canopy that could be lost to oak wilt disease. However, suitable GCWA habitat has a substantial component of Ashe juniper in the canopy and Ashe juniper is not susceptible to oak wilt. It is unlikely that all 134 acres of GCWA habitat within 30 feet of the Pipeline ROW is solely oak canopy.

3. The approach assumes that all of the oak trees within 30 feet of the edge of the Pipeline ROW have been wounded and infected by a contaminated nitidulid beetle or are connected through the root system to a damaged oak tree within the Pipeline ROW that has become infected in this manner. However, the proportion of nitidulid beetles that carry oak wilt fungal spores appears to vary significantly over time and space. Hayslett et al. (2009) reported beetle contamination rates at one Texas site that ranged from a rate of 83% to 3%. Furthermore, even with deliberate and concentrated exposure to oak wilt spores, studies by Camilli et al. (2007) showed that the infection rate was 40% to 60% for treatments where the spore-containing solution was painted onto a fresh (10-minute-old) pruning cut and 20% of oak trees with painted wounds also contracted the disease. It is unlikely that all wounded oak trees were infected by a contaminated nitidulid beetle and will contract oak wilt disease.
4. The approach assumes that all infected oak trees will die of oak wilt disease. However, live oaks are a significant component of the woodland canopy in the vicinity of the Pipeline. Live oak trees are moderately resistant to oak wilt disease and some individuals persist within oak wilt infection centers. Therefore, not all infected live oak trees are certain to die from the disease. Recommended management practices for oak wilt include trenching 100 feet beyond the location of an infected tree and the removal of healthy trees within the 100-foot barrier. Considering this recommendation, it might be reasonable to model additional oak wilt impacts out to a distance of 100 feet. However, given the highly conservative nature of the assumptions listed above that overestimate the extent of likely additional oak wilt impacts within the 30-foot zone and the implementation of the monitoring and remediation measures (subject to landowner permissions), the approach for estimated the extent of such impacts is reasonable.

PHP has secured the right to acquire and will provide an additional 0.5 acre of GCWA offsets for each 1 acre of potential new oak wilt impact, resulting in an additional 67 (rounded up) acres of offset. This additional 0.5-to-1 offset ratio accounts for a level of habitat degradation not explicitly contemplated in the offsets already provided by PHP for the GCWA (i.e., the addition of the 1,363-acre Igau Ranch to the Balcones Canyonlands National Wildlife Refuge). The proposed additional 0.5-to-1 offset ratio reasonably captures the magnitude of any additional impact to the breeding, feeding, and sheltering activities of the GCWA resulting from oak wilt that may have been caused by PHP. As noted above, it is unlikely that the lands with the 30-foot oak wilt impact zone will become completely lost to current or future use by the GCWA as a result of oak wilt disease. Therefore, it remains appropriate for the amount of the offset to be less than that offered for full habitat loss. PHP provided offsets for habitat loss within the Pipeline ROW at a ratio of 2-to-1. With the original provision of 0.5-to-1 offset for indirect habitat modification described in the Biological Assessment, PHP will provide a total of 1-to-1 offset for the indirect modification of GCWA habitat within the 30-foot oak wilt impact zone.

Source of Conservation Credits

To comply with the Service's requirement after review of the allegations regarding alleged failure to comply with oak wilt measures, PHP canvassed a number of conservation banks and other conservation providers for additional offset opportunities and considered location in its decision-making. PHP has secured the right to acquire and will purchase 67 GCWA

conservation credits from the Hickory Pass/Hickory Ridge conservation banks located in Burnet County, Texas. These related conservation banks contain 3,436 acres and represent 3,515.5 GCWA conservation credits (RIBITS website at https://ribits.usace.army.mil/ribits_apex/f?p=107:10:4109910920650::NO::P10_BANK_ID:2193). The Hickory Pass/Hickory Ridge conservation banks conserve GCWA in Recovery Region 5, which also includes Hays and parts of Blanco Counties.

Like the Igau Ranch that PHP acquired and will transfer to the Balcones Canyonlands National Wildlife Refuge, the Hickory Pass/Hickory Ridge conservation banks are also within the acquisition boundary of the Balcones Canyonlands National Wildlife Refuge (i.e., southeastern Burnet County). Indeed, unique among GCWA conservation banks, conservation easements under Hickory Pass/Hickory Ridge are granted to the Service rather than to a third-party land trust. Hickory Pass/Hickory Ridge conservation banks (3,436 acres), Igau Ranch (1,363 acres), the Balcones Canyonlands National Wildlife Refuge (19,125 acres, as reported in Groce et al. 2010), and the nearby Balcones Canyonlands Preserve (more than 32,000 acres in western Travis County) form a focal conservation area in Recovery Region 5 that permanently protects approximately 56,000 acres for the benefit of the GCWA. Only Recovery Region 3 (with Fort Hood) to the north of Recovery Region 5 contains a protected focal area for GCWA of comparable size.

As described in the Hays County Regional Habitat Conservation Plan (2010): Hays County lacks the very large, contiguous blocks of potential warbler habitat that are present in some adjacent counties (i.e., Travis County and, to a lesser extent, Comal County) (Figure 3-3). The potential warbler habitat in Hays County, while fairly abundant, is distributed in smaller, more isolated patches (Figure 3-2). Therefore, Hays County generally lacks an obvious “focal area” to contribute to the recovery goals for Recovery Region 5.

The distribution of GCWA habitat in Blanco, Gillespie, and Kimble Counties is similarly patchy, as shown in Morrison et al. (2010). Therefore, the GCWA conservation credits available from Hickory Pass/Hickory Ridge conservation banks, which are within one of the Recovery Regions crossed by the Pipeline and expand on an important focal conservation area, provide benefit to the species beyond the conservation benefit of a similar amount of GCWA habitat protected within Kimble, Gillespie, Blanco, or Hays Counties.

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