PUBLIC VERSION

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via electronic filing

March 4, 2010

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
Dockets Room, Room lA
888 First Street, N.E.
Washington, D.C. 20426

RE: Palomar Gas Transmission, LLC
Response to Environmental Data Request dated February 12, 2010
Docket No. CP09-35-000

Dear Ms. Bose:

On December 12, 2008, Palomar Gas Transmission, LLC ("PGT") filed with the Federal Energy Regulatory Commission ("FERC" or "Commission") an Application for a Certificate of Public Convenience and Necessity and Presidential Permit ("Application"), pursuant to Section 7 of the Natural Gas Act, 15 U.S.C. §717f and Part 157 of the Regulations, 18 C.F.R. § 157.1, *et al.* (2007), for the Palomar Gas Transmission Project ("Palomar Project"). On February 12, 2010, the FERC's Office of Energy Projects ("OEP") issued data requests concerning PGT's Palomar Project. PGT hereby submits its responses to the February 12th data requests.

This filing consists of two (2) compact disks ("CD"): CD Volume I - Public and CD Volume II - Privileged & Confidential ("Privileged"). PGT respectfully requests that the CD, as well as the paper copy, of Volume II be accorded privileged and confidential treatment pursuant to 18 C.F.R. 388.112. Accordingly, PGT has marked the CD, as well as the paper copy, of Volume II, as "Privileged and Confidential - Do Not Release".

Hard-copies of this filing (an original and three (3) paper copies of the Public Volume and one (1) paper copy of the Privileged Volume) are also provided in accordance with the Commission's regulations. Please note that PGT is submitting Public and Privileged copies of this filing in electronic format on CD and hard-copy format directly to the FERC Project Manager (Douglas Sipe) and third-party contractor (TetraTech). PGT is also providing courtesy, Public copies of this filing via CD to the additional interested parties, as listed below (e.g., Oregon Fish and Wildlife Office; U.S. Army Corps of Engineers; USDA Forest Service; USDI Bureau of Land Management). PGT will serve the Public version of this filing to the official docket service list.

I have read the information contained herein and it is true to the best of my knowledge and belief. Furthermore, to the best of my knowledge and belief, the paper copies contain the same information as provided on the compact disks. If there are any questions regarding this filing, please do not hesitate to contact:

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Further, PGT hereby provides its notice that effective immediately, the position of Associate General Counsel for Palomar Gas Transmission, LLC will be held by the undersigned, replacing Carl M. Fink.

Respectfully submitted,

/s/

Eva N. Neufeld
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Enclosures

cc:
Public Files, Docket No. CP09-035-000
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Docket No. CP09–35–000

PALOMAR GAS TRANSMISSION, LLC
PALOMAR PIPELINE PROJECT

Volume I – Public

March 2010

Response to February 12, 2010
Environmental Data Request

PALOMAR GAS TRANSMISSION PROJECT
Docket No. CP09-35-000

Response to February 12, 2010
Environmental Data Request

Prepared by

NATURAL RESOURCE GROUP

March 2010

PALOMAR GAS TRANSMISSION PROJECT
Palomar Gas Transmission, LLC (PGT)
Docket No. CP09-35-000

RESPONSE TO FEBRUARY 12, 1010
ENVIRONMENTAL DATA REQUEST

1. Identify whether the proposed project would cross any of the four northern spotted owl Areas of Concern (AOCs) designated on the Mt. Hood National Forest. If any AOCs are crossed, provide the number of acres that would be impacted. Quantify the number of acres impacted by forest condition and the time needed to restore the habitat to its original condition, i.e. temporary (less than 3 years), long-term (more than 3 years), and permanent (impacts to old-growth forest). Describe whether the impacts would decrease available dispersal habitat in the AOC to less than 50 percent.

RESPONSE:

The proposed Palomar Project will cross two northern spotted owl (NSO) Areas of Concern (AOC) in the Mount Hood National Forest (MHNF). The proposed pipeline route will cross approximately 6 miles of AOC #2 near its southern boundary between mileposts (MP) 45 and 51. The proposed pipeline route will cross approximately 10 miles of AOC #3 along its eastern boundary between MPs 54 and 64.

PGT obtained Geographic Information System (GIS) layers of NSO suitable habitat, NSO dispersal habitat, and NSO habitat-capable acres (replacement habitat)[1] from the MHNF for this analysis. Table 1-1 provides a quantification of impacts on NSO suitable habitat, dispersal habitat, and habitat-capable acres for AOCs #2 and #3. Forest management guidelines require that at least 50 percent of each quarter-section in an AOC be maintained or be managed to become NSO dispersal habitat. The areas on the MHNF were selected because they were lacking in dispersal habitat and it was deemed important to maintain a dispersal corridor. GIS data for quarter-sections were not available; therefore, PGT conducted the requested analysis on sections crossed. Dispersal habitat has been defined as forest stands greater than 40 years old with at least 40 percent canopy cover. Following guidance provided by the U.S. Fish and Wildlife Service (FWS) (FWS, 2009a; FWS, 2009b), PGT considers all impacts on NSO habitat (dispersal and suitable) as permanent. Impacts on habitat-capable acres are considered long-term as defined in the data request above. Temporary impacts may occur in recent timber harvest areas but were not removed from the habitat-capable acres category. Therefore, these acres are conservatively considered long term.

As stated above, the proposed pipeline route will cross 6 miles of AOC #2. A total of 16.0 acres of NSO dispersal habitat will be removed in AOC #2. All nine of the sections crossed in AOC #2 have not met the management goals for AOCs and are currently deficient in dispersal habitat (i.e., below the 50 percent threshold). However, the removal of dispersal habitat associated with the Palomar Project will not significantly reduce the overall percentage of dispersal habitat available to NSOs. The maximum change in dispersal habitat that would be caused by

1 Habitat-capable acres are defined by the FWS as forests below the elevation limits of occupancy by territorial spotted owls, excluding serpentine soil areas that are capable of growing and sustaining structural conditions of spotted owl habitat (FWS, 2008). Guidance from the FWS suggested using the term “habitat-capable” or “replacement habitat” instead of non-suitable habitat (FWS, 2009c).

construction of the pipeline at the individual section level is 0.96 percent. PGT's overall impact on dispersal habitat in AOC #2 is less than 0.1 percent.

A total of 33.3 acres of NSO dispersal habitat will be removed in AOC #3. Of the 11 sections crossed in AOC #3, 10 have not met the management goals for AOCs and are currently deficient in dispersal habitat (i.e., below the 50 percent threshold). However, the removal of dispersal habitat associated with the Palomar Project will not significantly reduce the percentage of dispersal habitat available to NSOs. The maximum change in dispersal habitat that would be caused by construction of the pipeline at the individual section level is 2.9 percent. PGT's overall impact on dispersal habitat in AOC #3 is less than 0.1 percent. In addition, impacts associated with the project will not reduce the available dispersal habitat below 50 percent in the remaining section.

The delineation of AOCs in the MHNF was intended to determine areas that may impede NSO dispersal. Of the sections crossed by the Palomar Project in AOCs #2 and #3, all but one are currently deficient in dispersal habitat. One section is currently above the 50 percent habitat threshold (64 percent) but the acres removed will not reduce the amount of NSO dispersal habitat available below the threshold.

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U.S. Fish and Wildlife Service (FWS). 2008. Final Recovery Plan for the Northern Spotted Owl (*Strix occidentalis caurina*). Region 1, U.S. Fish and Wildlife Service, Portland, Oregon.

U.S. Fish and Wildlife Service (FWS). 2009a. Meeting on April 20 between the FWS and PGT.

U.S. Fish and Wildlife Service (FWS). 2009b. Correspondence dated August 17, from P. Henson (FWS) to K. Bose (Federal Energy Regulatory Commission).

U.S. Fish and Wildlife Service (FWS). 2009c. Telephone conversation on September 4, between B. Tuerler (FWS) and C. Young (Natural Resource Group, LLC).

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2. In order to adequately assess impacts on the northern spotted owl, provide an analysis of the acreage of potential and suitable owl habitat within the analysis area in the following categories:

a. Replacement (0–39 years);

b. Recruitment (40 years and older but not suitable);

c. Suitable (nesting, roosting, and foraging [NRF] and dispersal); and

d. Assumed suitable (areas where surveys have not been completed because access has been denied).

Quantify these habitats by temporary, long-term, and permanent impacts.

RESPONSE:

Table 2.3.1-1 of PGT's Applicant-prepared Draft Biological Assessment (ADBA) tabulates impacts on habitat-capable (replacement) acres[2], dispersal (40 to 80 year old forest stands), and suitable (>80 year old forest stands assumed to be northern spotted owl (NSO) nesting, roosting, and foraging habitat) within the project area. Table 2.3.1-1 has been revised to reflect route adjustments and additional survey data collected since the ADBA was filed in June 2009 (see the response to data request #6). The term "recruitment" is generally not used for NSO assessments, but the definition provided above for "recruitment" habitat matches generalized definitions of NSO dispersal habitat. Therefore, the term "dispersal" rather than "recruitment" is used in PGT's assessment. In summary, the revised table 2.3.1-1 provides the information requested in items a. through d. using slightly different terminology to be more consistent with past northern spotted owl assessments and guidance received from the U.S. Fish and Wildlife Service (FWS).

In the Coast Range, PGT conducted aerial photography reviews to assign habitat suitability to forest stands that were not available for survey. Stands that had the same visual characteristics as stands of known ages were assumed to be similar in age and structure. These data were used when calculating impacts on suitable, dispersal, and habitat-capable acres in the Coast Range. The removal of occupied habitat was conducted at the individual owl scale as described below.

For each historic and surveyed spotted owl location, the entire home range (1.2 miles and 1.5 miles in the Cascades and Coast Range, respectively) was delineated using existing data sources from the U.S. Forest Service (USFS), Bureau of Land Management (BLM), Confederated Tribe of Warm Springs, and Oregon Department of Forestry, or the aerial photography exercise described above. These data were then used to characterize each forest stand in every owl circle as suitable, dispersal, or habitat-capable. Analyses were conducted following the USFS and BLM methodology found in their *Biological Assessment for LAA Projects with the Potential to Modify the Habitat of Northern Spotted Owls* (USFS and BLM, 2008). This method uses the "40 percent rule" at the scale of a spotted owl home range to

2 Habitat-capable acres are defined by the FWS as forests below the elevation limits of occupancy by territorial spotted owls, excluding serpentine soil areas that are capable of growing and sustaining structural conditions of spotted owl habitat (FWS, 2008). Guidance from the FWS suggested using the term "habitat-capable" or "replacement habitat" instead of non-suitable habitat (FWS, 2009c).

determine if incidental take of the spotted owl is likely to occur when suitable habitat is removed by timber activities. If timber removal reduces the amount of spotted owl suitable habitat within a provincial home range to less than 40 percent, incidental take of the spotted owl(s) occupying that home range is considered to be likely (USFS and BLM, 2008). The removal of suitable habitat within the 0.5-mile core area around a NSO nest may negatively impact NSOs more than habitat removal in the provincial home range. A "50 percent rule" at the scale of a spotted owl core area has been used to determine if timber harvest actions are likely to cause adverse effects on NSO (USFS and BLM, 2008). In other words, if the proposed action reduces the core area of a NSO home range below 50 percent suitable habitat, it is assumed that this home range will no longer support a nesting owl pair. Any habitat removal at or in the immediate vicinity of a NSO nest site is also considered by the FWS to cause take of the spotted owl (USFS and BLM, 2008). Table 2.3.1-2 of PGT's ADBA, a revised version of which is included as part of PGT's response to data request #6, provides the full results of this analysis and an effects determination for each owl circle based on the method described above.

In areas where survey access was denied, PGT used aerial photography to delineate assumed suitable habitat as described above. These areas were then analyzed using the FWS predicted owl circle centroid data as directed by the FWS. Results of this analysis showed that all predicted owl circles were below the >32 to 35 percent suitable habitat threshold (including the assumed suitable habitat) necessary to presume occupancy by a NSO pair (FWS, BLM, and USFS, 2008). There were no assumed occupied NSO areas in unsurveyed, assumed suitable habitat in the vicinity of the proposed project.

All impacts on NSO suitable and dispersal habitats are considered permanent for the purpose of conducting PGT's impact assessment. PGT adopted this approach after receiving guidance and instruction from the FWS (FWS, 2009a; FWS, 2009b). Impacts on habitat-capable acres are considered long-term as defined in data request #1 (i.e., more than 3 years). Temporary impacts (i.e., less than 3 years) may occur in recent timber harvest areas but were not removed from the habitat-capable acres category. Therefore, these acres are conservatively considered long term.

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U.S. Fish and Wildlife Service (FWS). 2008. Final Recovery Plan for the Northern Spotted Owl (*Strix occidentalis caurina*). Region 1, U.S. Fish and Wildlife Service, Portland, OR.

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U.S. Forest Service (USFS) and Bureau of Land Management (BLM). 2008. Biological Assessment for LAA Projects with the potential to modify the habitat of Northern Spotted

Owls, Willamette Planning Province 2009-2010. 165 pp.

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3. Provide an analysis of the acreage of suitable habitat for the Columbia white-tailed deer that would be impacted by the project (refer to the comments filed by the U.S. Fish and Wildlife Service [FWS] on January 27, 2010). Quantify the acres of habitat by temporary, long-term, and permanent impacts.

RESPONSE:

In its Applicant-prepared Draft Biological Assessment (ADBA), PGT reported that construction of the pipeline may result in changes in habitat quantity and quality in the area. The ADBA reported that a total of 2.2 acres of suitable habitat will be temporarily removed at the extreme terminus of the pipeline. However, PGT has committed to restoring the right-of-way between mileposts (MPs) 214.8 and 216.9 with native plants and wildlife forage species to increase the habitat quality and benefit deer and other wildlife in the area. Therefore, PGT concluded that construction of the Palomar Project will result in temporary impacts on Columbia white-tailed deer (CWTD) during the period of pipeline construction. The Palomar Project will not have any long-term or permanent impacts on CWTD habitat.

PGT's Definition of Suitable Habitat in its ADBA

Suitable habitat for CWTD has been described in past research papers, reports, and discussions with staff of the Julia Butler Hansen National Wildlife Refuge (Clark, 2008; David, 2008; Meyers, 2009a; Meyers, 2009b; Meyers, 2009c; Meyers, 2009d; Meyers, 2009e). According to scientific literature, CWTD tend to prefer specific habitat types and compositions, and are most closely associated with westside oak habitats within 200 meters of a stream or river. PGT defined CWTD suitable habitat in the ADBA filed in June 2009 as follows:

> Columbian white-tailed deer are associated with the bottomlands, floodplains, and islands of the Lower Columbia River. Whitetail deer habitat in general is characterized by a park-forest environment, as opposed to a closed canopy or open environment (Gavin et al., 1984). Habitat for this subspecies includes riparian forest, pasture, and brush-land (Gavin et al., 1984). Columbian white-tailed deer use areas that provide both adequate cover and forage (forbs, browse, and grasses) more often than areas that provide only cover or forage (Suring and Vohs, 1979). Similarly, areas that provide only forage but have nearby cover are used more often than forage habitat with no adjacent cover (Suring and Vohs, 1979). Smith (1985) found that Columbian white-tailed deer densities in the Lower Columbia River area were positively correlated with amount of woody cover. On the Julia Butler Hansen National Wildlife Refuge (JBHNWR) in the fall, winter, and spring, Columbian white-tailed deer use habitat with an open canopy of Sitka spruce (*Picea sitchensis*) and a grass understory. In the spring and summer, they also use open canopy forest that is composed of western red cedar (*Thuja plicata*), red alder (*Alnus rubra*), and Sitka spruce (Suring and Vohs, 1979). Home ranges of adult female and male Columbian white-tailed deer on the JBHNWR are 0.1 to 1.2 and 0.4 to 1.2 square miles, respectively (Gavin et al., 1984). Both males and females used the same home ranges from year to year (Gavin et al., 1984).

"Atypical" Habitat Characterization

Based on the definitions summarized in the ADBA and a phone call with U.S. Fish and Wildlife (FWS) biologist, Paul Meyers, PGT characterized the CWTD habitat in the Bradwood area as "atypical" in the ADBA (Meyers, 2009c). Meyers used the word "atypical" to describe habitat in the Bradwood area from his personal observations made prior in 2009.[3] PGT's use of the Meyers call log in the ADBA was intended to characterize the habitat rather than to quantify impacts. The research papers and reports (Northwest Power and Conservation Council, 2004; O'Neil et al., 2001; FWS, 1983; Gavin et al., 1984; Suring and Vohs, 1979) cited in the ADBA support the idea that habitat in the Palomar Project action area is atypical for CWTD. Habitats between MPs 214.8 to 216.9 are dominated by Douglas fir or shrubby growth associated with regenerating Douglas fir forests and not riparian bottomlands with Sitka spruce, red alder, and western red cedar. Suitable habitat was delineated in the action area based on the preferred habitat characteristics of CWTD habitat described in research papers and reports, namely, riparian bottomlands with adjacent woody cover. Approximately 600 feet of the proposed route at the extreme terminus of the proposed route occurs in the bottomlands along the Columbia River.

In the ADBA, PGT conservatively identified this area, plus some adjacent upland forest, as suitable habitat (2.2 acres). To confirm this delineation, PGT provided a map of proposed CWTD habitat in the project area to the FWS. The FWS generally agreed with the delineations on this map in the vicinity of the Bradwood area but asked that it not be published because of the implications it may have regarding habitat downriver and outside of the project area. The FWS added several areas of second-growth to PGT's delineation but qualified these additions as "outside (or just barely touches) the pipeline" (Meyers, 2009e). This statement is in agreement with PGT's conclusion that CWTD habitat exists only at the extreme terminus of the pipeline and some adjacent upland forest (i.e., 2.2 acres). Moreover, recent observations noted that invasive plant species (e.g., reed canary grass and scotchbroom) dominate the area, reducing its value to CWTD. PGT's determination that the proposed pipeline project will not adversely affect CWTD was based upon a conservative estimate of suitable CWTD habitat, and, if anything, overstates the suitability of CWTS habitat.

FWS's Categorization of CWTD Habitat

The FWS provided a habitat definition (also included as Attachment C of the January 26, 2010 submittal) to PGT via email on December 16, 2009 that described suitable CWTD habitat as "forested habitat with open canopy" and "fields and pastures up to 250 m from any forested edge". However, this definition is too general to adequately define suitable habitat for this species. Numerous research papers and reports (e.g., Gavin et al., 1984; Suring and Vohs, 1979; O'Neil et al., 2001) specify that the deer occur in riparian bottomlands that are characterized by red alder, Sitka spruce, and western red cedar, and do not generally appear in forested habitat with open canopies. The FWS definition of suitable CWTD habitat in the January 26, 2010 submittal also appears to be inconsistent with the FWS' CWTD fact sheet definition found on their website (FWS, 2009), which states that CWTD are closely associated with riparian (riverside) habitats and "tidal spruce" habitats.

3 It's important to note that Meyers provided clarification on disturbance from human presence and lighting in his April 3, 2009 response to the phone log, but did not indicate any corrections were needed in regards to how the habitat was described, including the use of it being "atypical."

Calculations of Suitable and Less Suitable Habitat

The FWS recommended in its December 16, 2009 email and subsequent January 26, 2010 filing that PGT categorize CWTD habitat into two types: "suitable" habitat (forested habitat with open canopy) and "less suitable" habitat (closed canopy habitats). Although this definition is not consistent with the scientific literature or the FWS fact sheet, PGT calculated the potential impact on these two types of habitats due to construction of the proposed pipeline. By using the habitat categories provided by the FWS, PGT categorized the habitat along the proposed pipeline between MPs 214.8 and 216.9 as “less suitable,” with the last 600 feet of the proposed right-of-way defined as “suitable.” A total of 1.8 and 31.4 acres of “suitable” and “less suitable” CWTD habitat would be impacted, respectively, using these definitions. Construction of the proposed pipeline will result in a conversion of 31.4 acres of second-growth Douglas fir plantation into open right-of-way. This will increase its suitability to CWTD after construction because the pipeline right-of-way and immediately adjacent forest edge (up to 200 feet) align with the new definition of "suitable" CWTD habitat. Although Douglas fir forests are not preferred by CWTD, forage species will be planted in the open right-of-way, which may increase the potential for CWTD use. Consequently, PGT’s clearing and subsequent restoration efforts will benefit the CWTD by creating openings in the Douglas fir forests and a net increase of forage generated by restoration plantings. However, the habitat’s suitability for CWTD is still questionable given that it is not riparian bottomlands.

Bradwood Project’s Analysis of Impacts

The FWS’ December 16, 2009 email stemmed in part from the analysis of impacts on the CWTD from the Bradwood Landing Project and its subsequent "likely to adversely affect" determination. The impacts associated with construction of a liquefied natural gas (LNG) terminal and warming towers are significantly different than those associated with construction of a natural gas (or other) pipeline. The Bradwood Landing Project must consider impacts associated with construction and operation of a large industrial facility as well as a pipeline that parallels the Columbia River within its adjacent bottomland habitats. This area contains habitats matching CWTD habitat definitions: riverine bottomlands with scattered alder trees and thick alder islands.

In contrast, PGT’s relatively small aboveground meter station will lie entirely within the disturbed footprint of the Bradwood Landing Project’s LNG terminal site, and only the last 600 feet of pipeline will extend through the river bottom where suitable CWTD habitat may exist (albeit through a weed-infested portion of that bottomland). Therefore, the basis for any determination of effect is significantly different for the Palomar Project in comparison with the Bradwood Landing Project.

Conclusion

The FWS’ Endangered Species Act Consultation Handbook states that a “not likely to adversely effect” determination is appropriate when “effects to the species or critical habitat are expected to be discountable, insignificant, or completely beneficial” (FWS and National Marine Fisheries Service, 1998). The handbook defines an insignificant effect as one on a species that can not be meaningfully detected, evaluated, or measured. PGT believes that the removal of 2.2 acres of potentially suitable CWTD habitat (or 31.4 of "less suitable" and 1.8 acres of "suitable" habitat using the FWS’ habitat categorization) will not have a measureable impact on the survival or recovery of a CWTD and may in fact have a beneficial impact on CWTD habitat. Therefore,

PGT maintains that a "not likely to adversely effect" determination is appropriate.

However, PGT remains committed to avoiding or minimizing impacts on CWTD. As stated above, the Palomar Project may benefit the CWTD through restoration of the right-of-way with native vegetation. In addition, as described in its ADBA, PGT has agreed to implement the following conservation measures to ensure that the species will not be negatively impacted by construction of the pipeline:

- avoiding construction and human presence during the critical fawning season (June 1 – July 15);
- installation of escape ramps in the open trench;
- accelerated construction to avoid long periods of time with an open trench;
- implementation of a 25 miles per hour speed limit on access roads from MPs 214.8 to 216.9;
- removal of Port Westward Pipe Yard near Locoda, Oregon from project plans because of the potential for CWTD presence in the area;
- reduced duration for human presence by coordinating activities to occur concurrently where possible; and
- environmental training and education for all personnel involved in the construction of the proposed project (see also the response to data request #4).

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U.S. Fish and Wildlife Service (FWS) and Marine Fisheries Service. 2004. Endangered Species Act – Section 7 Consultation, Informal Concurrence and Formal Biological Opinion and Conference. ODOT's OTIA III Statewide Bridge Delivery Program. June 28, 2004.

Young, D. 2009. Electronic mail communication on December 16, between C. Young (Natural Resource Group, LLC) and D. Young (Oregon U.S. Fish and Wildlife Service (503)231-6179).

Response by: John Cassady, Palomar Gas Transmission, LLC, (503) 833-4703

4. The FWS has requested that Palomar educate its construction contractors and staff working in the areas where Columbia white-tailed deer could occur in order to lower collision risk with this animal. Indicate whether Palomar agrees to implement this conservation measure. If Palomar does not intend to implement this measure, identify what alternative measure(s) Palomar would implement to lower the risk of collision.

RESPONSE:

PGT will educate its construction contractors and staff working in the area where Columbia white-tailed deer could occur to lower collision risk with this species, as an element in its environmental training program.

Response by: John Cassady, Palomar Gas Transmission, LLC, (503) 833-4703

5. Provide overview maps (one map for each species) for both marbled murrelet and northern spotted owl that show (when applicable):

a. Proposed centerline and facilities;

b. Critical habitat;

c. Species-specific analysis area;

d. Late-successional reserves;

e. Stands that are occupied, assumed occupied, and unlikely to be occupied (surveyed);

f. Potential nest trees; and

g. Verified suitable habitat and assumed suitable habitat.

RESPONSE:

Marbled Murrelet

The marbled murrelet overview maps are provided under separate cover ("Privileged and Confidential - Do Not Release") as Attachment 5-1 in Volume II of this data request response.

The marbled murrelet overview maps include items a., b., c., f., and g. Item d. does not apply for the marbled murrelet.

Regarding the data shown on the maps, please note the following:

The species-specific analysis area (item c.) includes all areas within the range of the marbled murrelet (Zones 1 and 2) within the proposed action area of the Palomar Project. Additionally, PGT's survey corridor was added to the maps to indicate where PGT was able to obtain survey data. This survey corridor is 0.5 mile wide (0.25 mile on either side of the centerline) on Oregon Department of Forestry (ODF) land and 220 feet wide (110 feet on either side of the centerline) on private lands. The only exception is on Stimson lumber property (private), where PGT was able to obtain permission to perform a broader habitat analysis out to 300 feet on either side of the survey area (for a total width of 820 feet) in order to evaluate impacts on the species. PGT attempted to obtain permission to perform the broader habitat analyses on other private timber lands but landowner permission was not granted.

Item e. is not implicitly shown on the map as it is implied in all areas that contain suitable or assumed suitable habitat. Since no marbled murrelets exhibiting occupancy behavior were detected during the 2008 and 2009 survey seasons, no stands are considered occupied in the project area. All stands with potential nest trees on ODF lands that have had 2 years of survey are considered unoccupied. This includes all potential nest trees that were identified in the survey area except for those trees removed from PGT's survey at the request of the ODF because they were within planned timber sales (U.S. Fish and Wildlife Service, 2008). The areas removed from PGT's survey effort received previous surveys conducted by ODF contractors and were deemed unoccupied by the ODF.

Two potential nest trees were identified outside of ODF lands during PGT's murrelet habitat assessment; one on a public road (Timber Road) at milepost (MP) 177.4 and the other near the terminus of the proposed pipeline at MP 216.2. The Timber Road potential nest tree received 2 years of surveys that resulted in a determination that the site is likely unoccupied. The other potential nest tree was recorded and later removed from consideration because the potential nest platform does not qualify as a platform by definition for habitat outside of critical habitat boundaries (≥7 inches in diameter). This tree is near the terminus of the route at MP 216.2, and was included in the June 2009 Applicant-prepared Draft Biological Assessment as 1.2 acres of suitable habitat within private lands in Clatsop County. The subsequent removal of this tree and the associated 1.2 acres has been reflected in table 7-1 as part of the response to data request #7.

For the purpose of this exercise, assumed occupied stands are those forest tracts within the survey corridor where suitable habitat has been assumed due to a lack of survey permission. Therefore, as stated above, item e. is not implicitly mapped because it can be inferred from these stands.

In summary, there are no "occupied" stands in the project area. Stands that are "assumed occupied" only occur in locations where survey access was unavailable or denied. All other stands with nesting platforms are considered "unlikely to be occupied" since they were surveyed according to the accepted marbled murrelet protocol to determine stand or platform occupancy.

Northern Spotted Owl

The northern spotted owl (NSO) overview maps are provided under separate cover ("Privileged and Confidential - Do Not Release") as Attachment 5-2 in Volume II of this data request response.

The NSO overview maps include items a., b., c., d., and g. for both the currently proposed route and the Warm Springs Alternative. Items e. and f. do not apply for the NSO.

Regarding the data shown on the maps, please note the following:

The species-specific analysis area (item c.) includes all areas within the range of the NSO within the proposed action area of the Palomar Project. Additional data included on the NSO overview maps include Areas of Concern as well as owl nest areas, core areas, and home ranges of historic and surveyed owl locations. The project analysis area and survey corridor in the Cascades was 1.2 miles on either side of the proposed centerline (2.4 miles total). In the Coast Range, the analysis area was 1.5 miles on either side of the proposed centerline (3.0 miles total). ODF survey data were used in lieu of additional pipeline-specific surveys. Survey coverage is also displayed on the maps. In areas where survey permission was not available to document habitats in the analysis area, aerial photography interpretation was used to assign habitat suitability and dispersal capabilities.

Reference

U.S. Fish and Wildlife Service. 2008. Meeting on June 18 between the U.S. Fish and Wildlife Service, Oregon Department of Forestry, and PGT.

Response by: John Cassady, Palomar Gas Transmission, LLC, (503) 833-4703

6. Update the following tables to reflect route adjustments and additional survey data collected since the draft Biological Assessment (BA) was submitted in June 2009:

a. Table 2.3.1-2 (also add categories for NRF, dispersal, and replacement habitat and present acres of each habitat type that would be removed);

b. Table 2.3.1-1;

c. Table 2.2.2-1 (also add categories of habitat indicating age of trees [NRF, dispersal, and replacement]); and

d. Table 1.2.3-1 (also define area in critical habitat by tree age/habitat type [suitable, assumed suitable, recruitment, and replacement]).

RESPONSE:

a. Table 2.3.1-2 has been revised to include the requested additional information as well as information and results from the second year of northern spotted owl (NSO) surveys. The table is included as Attachment 6-1.

b. A revised table 2.3.1-1 is included at Attachment 6-2.

c. Table 2.2.2-1 presents the results of the Biomapper modeling software analysis run by the U.S. Fish and Wildlife Service (FWS). The Biomapper model only provides an estimate of suitable habitat. Nesting, roosting, and foraging habitat and dispersal habitat within the action area (1 mile on either side of the proposed pipeline) by pipeline section are currently provided in table 2.2.2-1 (a revised version of which was filed with the Federal Energy Regulatory Commission (FERC) in a supplemental filing dated September 30, 2009). Minor changes to the route did not change the results of this analysis as they provide an approximate estimate of the habitat conditions of the area regardless of pipeline route. Biomapper suitability categories include suitable, dispersal, and unsuitable and do not include categories indicating the age of trees other than what are included by definition of these habitat classifications. Stand age was not used to characterize the categories. Biomapper utilizes Landsat aerial imagery and known NSO sites in the various physiographic provinces to develop Habitat Suitability Index (HIS) scores (0-100) on a pixel by pixel basis and cut points above which would be suitable habitat. HSI values >44 in the Eastern Cascades Province, HSI >39 in the Western Cascades Province, and HSI >37 in the Coast Range Province were considered suitable habitat. HSI scores >21 but less than the suitability HIS score for each province represented dispersal habitat and all scores <21 represent unsuitable habitats. Biomapper over estimates habitat and dispersal suitability and was not used to assess impacts. It only provides a baseline for habitat conditions of the region.

d. A revised table 1.2.3-1 is included as Attachment 6-3.

In addition to the tables included in the data request, PGT is providing its 2009 Addendum General Biological Survey Report, which includes the results of general biological surveys conducted on the route adjustments and other survey areas. The 2009 Addendum General Biological Survey Report is provided under separate cover ("Privileged and Confidential - Do

Not Release") as Attachment 6-4 in Volume II of this data request response. The area associated with these route adjustments was already included in the coverage area of any applicable species-specific surveys (e.g., NSO, marbled murrelet). The survey reports documenting the second year of these species-specific surveys were filed with the FERC in a supplemental filing dated November 23, 2009.

Response by: John Cassady, Palomar Gas Transmission, LLC, (503) 833-4703

ATTACHMENT 6-1

TABLE 2.3.1-2 *Revised 030410*

Palomar Gas Transmission Project
Habitat Removal and Effects Determination for Northern Spotted Owl Home Ranges Crossed By the Palomar Project

Owl Pair	MHNF ID or Centroid ID	Milepost (Physiographic Province)	Status	Parameter Evaluated	Suitable (NRF) Habitat (acres)	Dispersal Habitat (acres)	Capable (Replacement) Habitat (acres)	Percent of Owl Circle in Suitable (NRF) Habitat	Suitable (NRF) Habitat Removed (acres)	Dispersal Habitat Removed (acres)	Capable (Replacement) Habitat Removed (acres)	Total Habitat Removed (acres)	Percent in Suitable (NRF) Habitat, Post-construction	Percent Change in Suitable (NRF) Habitat Post-Construction
H-1	213	45.1 (East Cascades)	Historic	Nest Patch [a]	50.9	2.5	0.0	95%	0.0	0.0	0.0	0.0	95%	0.00%
				Core Area[b]	188.7	40.9	73.1	62%	1.1	1.2	5.9	8.2	62%	-0.36%
				Home Range[c]	469.8	567.1	538.4	30%	1.0	10.1	25.7	36.9	30%	-0.14%
H-2	212	46.2 (East Cascades)	Historic	Nest Patch	1.3	7.2	61.3	2%	0.0	6.2	0.2	6.4	2%	0.00%
				Core Area	65.4	76.0	284.7	15%	0.0	6.2	9.4	15.6	15%	0.00%
				Home Range	548.7	489.1	851.7	29%	1.8	7.4	21.9	31.0	29%	-0.09%
H-3	220	52.4 (West Cascades)	Historic	Nest Patch	36.4	17.9	15.5	52%	0.0	3.1	2.3	5.3	52%	0.00%
				Core Area	126.2	222.5	47.5	32%	2.1	8.3	3.1	13.5	31%	-0.52%
				Home Range	652.8	845.8	309.2	36%	6.9	14.0	9.4	30.3	36%	-0.50%
H-4	232	61.7 (West Cascades)	Historic	Nest Patch	58.0	0.0	11.8	83%	0.0	0.0	0.0	0.0	83%	0.00%
				Core Area	357.1	0.0	145.4	71%	0.0	0.0	0.0	0.0	71%	0.00%
				Home Range	1190.6	0.0	1704.5	41%	1.7	0.0	52.4	54.1	41%	-0.06%
H-5	228	64.5 (West Cascades)	Historic	Nest Patch	59.5	0.0	10.3	85%	0.0	0.0	0.0	0.0	85%	0.00%
				Core Area	311.9	17.1	173.5	62%	0.0	0.0	0.0	0.0	62%	0.00%
				Home Range	1567.5	360.6	967.0	54%	6.2	3.2	27.1	36.5	54%	-0.22%
H-6	40	66.5 (West Cascades)	Historic	Nest Patch	40.7	0.0	29.1	58%	1.6	0.0	4.5	6.1	56%	-2.28%
				Core Area	249.4	0.0	253.1	50%	0.9	0.0	17.6	18.5	49%	-0.49%
				Home Range	1104.8	123.4	1666.9	38%	4.5	0.4	23.4	28.3	38%	-0.18%
H-7	43	69.8 (West Cascades)	Historic	Nest Patch	34.9	15.8	19.1	50%	0.0	0.0	0.0	0.0	50%	0.00%
				Core Area	198.0	82.9	221.6	39%	0.0	0.0	0.0	0.0	39%	0.00%
				Home Range	1150.1	147.5	1597.5	40%	1.5	0.0	28.1	29.6	40%	-0.05%
H-8	248	71.1 (West Cascades)	Historic	Nest Patch	32.6	0.0	37.2	47%	0.0	0.0	0.0	0.0	47%	0.00%
				Core Area	271.8	0.0	230.2	54%	8.5	0.0	9.5	17.9	52%	-1.69%
				Home Range	1067.6	68.3	1759.2	37%	6.7	0.0	27.6	34.3	36%	-0.53%
H-9	38	71.7	Historic	Nest Patch	21.8	0.0	48.0	31%	0.0	0.0	0.0	0.0	31%	0.00%

TABLE 2.3.1-2 *Revised 030410*

Palomar Gas Transmission Project
Habitat Removal and Effects Determination for Northern Spotted Owl Home Ranges Crossed By the Palomar Project

Owl Pair	MHNF ID or Centroid ID	Milepost (Physiographic Province)	Status	Parameter Evaluated	Suitable (NRF) Habitat (acres)	Dispersal Habitat (acres)	Capable (Replacement) Habitat (acres)	Percent of Owl Circle in Suitable (NRF) Habitat	Suitable (NRF) Habitat Removed (acres)	Dispersal Habitat Removed (acres)	Capable (Replacement) Habitat Removed (acres)	Total Habitat Removed (acres)	Percent in Suitable (NRF) Habitat, Post-construction	Percent Change in Suitable (NRF) Habitat Post-Construction
		(West Cascades)		Core Area	285.9	19.6	197.0	57%	0.0	0.0	0.0	0.0	57%	0.00%
				Home Range	1606.1	75.9	1213.1	55%	10.9	0.0	8.3	19.2	55%	-0.37%
H-10	42	72.8	Historic	Nest Patch	18.7	0.0	51.1	27%	0.0	0.0	0.0	0.0	27%	0.00%
		(West Cascades)		Core Area	134.0	8.5	360.0	27%	0.0	0.0	0.0	0.0	27%	0.00%
				Home Range	1101.8	271.3	1522.0	38%	17.5	4.0	31.7	53.2	37%	-0.61%
H-11	140	78	Historic	Nest Patch	33.2	1.0	35.6	48%	0.0	0.0	0.0	0.0	48%	0.00%
		(West Cascades)		Core Area	307.9	21.7	172.9	61%	0.0	0.0	0.0	0.0	61%	0.00%
				Home Range	1474.6	208.3	1212.2	51%	0.0	3.4	15.3	18.7	51%	0.00%
H-12	178	78.4	Historic	Nest Patch	23.3	0.0	46.5	33%	0.0	0.0	0.0	0.0	33%	0.00%
		(West Cascades)		Core Area	168.4	53.4	280.7	34%	0.0	0.0	0.0	0.0	34%	0.00%
				Home Range	1169.0	434.1	1292.0	40%	1.6	0.0	4.8	6.4	40%	-0.05%
H-13	134	80.6	Historic	Nest Patch	2.1	32.4	35.3	3%	0.0	3.5	4.6	8.1	3%	0.00%
		(West Cascades)		Core Area	114.5	149.5	238.5	23%	3.3	4.1	8.8	16.3	22%	-0.67%
				Home Range	1125.7	350.8	1418.6	39%	20.2	0.0	30.3	50.4	38%	-0.81%
H-14	150	83.3	Historic	Nest Patch	40.8	2.3	26.7	58%	0.0	0.0	0.0	0.0	58%	0.00%
		(West Cascades)		Core Area	184.6	16.4	301.5	37%	0.0	0.0	0.0	0.0	37%	0.00%
				Home Range	1080.5	315.0	1499.6	37%	8.4	0.2	17.6	26.2	37%	-0.29%
H-15	145	85.4	Historic	Nest Patch	64.5	0.0	5.3	92%	0.0	0.0	0.0	0.0	92%	0.00%
		(West Cascades)		Core Area	422.2	0.0	80.3	84%	0.0	0.0	0.0	0.0	84%	0.00%
				Home Range	1983.5	16.7	894.9	69%	29.1	0.0	15.9	45.1	68%	-1.01%
H-16	133	87.8	Historic	Nest Patch	62.0	0.0	7.8	89%	0.0	0.0	0.0	0.0	89%	0.00%
		(West Cascades)		Core Area	319.9	0.0	182.6	64%	5.7	0.0	6.4	12.1	63%	-1.13%
				Home Range	1555.8	147.1	1192.2	54%	8.8	0.0	19.5	28.3	53%	-0.50%
S-1	CPB26	49.5	Pair	Nest Patch	57.9	1.9	10.0	83%	0.0	0.0	0.0	0.0	83%	0.00%
		(East Cascades)	Status Unknonwn	Core Area	273.6	49.4	178.9	55%	0.0	0.0	0.0	0.0	55%	0.00%

TABLE 2.3.1-2 *Revised 030410*

Palomar Gas Transmission Project
Habitat Removal and Effects Determination for Northern Spotted Owl Home Ranges Crossed By the Palomar Project

Owl Pair	MHNF ID or Centroid ID	Milepost (Physiographic Province)	Status	Parameter Evaluated	Suitable (NRF) Habitat (acres)	Dispersal Habitat (acres)	Capable (Replacement) Habitat (acres)	Percent of Owl Circle in Suitable (NRF) Habitat	Suitable (NRF) Habitat Removed (acres)	Dispersal Habitat Removed (acres)	Capable (Replacement) Habitat Removed (acres)	Total Habitat Removed (acres)	Percent in Suitable (NRF) Habitat, Post-construction	Percent Change in Suitable (NRF) Habitat Post-Construction
				Home Range	1049.6	627.1	1218.5	36%	0.0	0.0	0.0	0.0	36%	0.00%
S-2	TL30		Unknown	Nest Patch	41.2	0.0	28.6	59%	0.0	0.0	0.0	0.0	59%	0.00%
		(West Cascades)	Single	Core Area	276.7	0.0	225.8	55%	0.0	0.0	0.0	0.0	55%	0.00%
				Home Range	1357.1	0.0	1538.0	47%	0.7	0.0	35.0	35.7	47%	-0.02%
S-3	TL23	68	Pair	Nest Patch	67.2	0.0	2.6	96%	0.0	0.0	0.0	0.0	96%	0.00%
		(West Cascades)	Nesting Status Unknown	Core Area	288.6	0.0	213.9	57%	0.0	0.0	0.0	0.0	57%	0.00%
				Home Range	1624.5	72.7	1197.9	56%	2.8	0.0	53.7	56.5	56%	-0.10%
S-4	PC28	69.5	Pair	Nest Patch	23.7	0.0	46.1	34%	0.0	0.0	0.0	0.0	34%	0.00%
		(West Cascades)	Nesting Confirmed	Core Area	186.9	11.1	304.5	37%	1.8	0.0	12.5	14.3	37%	-0.36%
				Home Range	1160.1	148.1	1586.9	40%	3.7	0.0	34.5	38.2	40%	-0.19%
S-5	PC17	70.9	Pair	Nest Patch	20.7	0.0	49.1	30%	0.0	0.0	0.0	0.0	30%	0.00%
		(West Cascades)	Nesting Status Unknown	Core Area	153.6	11.1	337.9	31%	1.0	0.0	9.7	10.7	30%	-0.21%
				Home Range	916.4	84.1	1894.7	32%	3.9	0.0	36.8	40.7	31%	-0.17%
S-6	KC01	71.4	Unknown	Nest Patch	47.9	0.0	21.9	69%	0.0	0.0	0.0	0.0	69%	0.00%
		(West Cascades)	Male	Core Area	176.6	31.0	294.4	35%	0.0	0.0	0.0	0.0	35%	0.00%
				Home Range	1179.6	91.4	1624.2	41%	4.6	0.0	23.4	28.1	41%	-0.16%
S-7	CL35	63.7	Unknown	Nest Patch	27.1	3.0	39.7	39%	0.0	0.0	0.0	0.0	39%	0.00%
		(West Cascades)	Male	Core Area	321.7	57.1	123.7	64%	0.0	0.0	0.0	0.0	64%	0.00%
				Home Range	1562.6	372.5	960.0	54%	0.0	0.0	0.0	0.0	54%	0.00%
S-8	CL29	66.5	Pair	Nest Patch	13.1	27.0	29.7	19%	0.0	0.0	0.0	0.0	19%	0.00%
		(West Cascades)	Nesting Status Unknown	Core Area	190.5	108.4	203.6	38%	0.0	0.0	0.0	0.0	38%	0.00%
				Home Range	1189.5	247.7	1457.9	41%	8.5	3.7	29.2	41.4	41%	-0.29%
S-9	FC52	68	Pair	Nest Patch	25.2	6.7	37.9	36%	0.0	0.0	0.0	0.0	36%	0.00%

TABLE 2.3.1-2 *Revised 030410*

Palomar Gas Transmission Project
Habitat Removal and Effects Determination for Northern Spotted Owl Home Ranges Crossed By the Palomar Project

Owl Pair	MHNF ID or Centroid ID	Milepost (Physiographic Province)	Status	Parameter Evaluated	Suitable (NRF) Habitat (acres)	Dispersal Habitat (acres)	Capable (Replacement) Habitat (acres)	Percent of Owl Circle in Suitable (NRF) Habitat	Suitable (NRF) Habitat Removed (acres)	Dispersal Habitat Removed (acres)	Capable (Replacement) Habitat Removed (acres)	Total Habitat Removed (acres)	Percent in Suitable (NRF) Habitat, Post-construction	Percent Change in Suitable (NRF) Habitat Post-Construction
		(West Cascades)	Nesting Status Unknown	Core Area	185.5	45.0	271.9	37%	0.0	0.0	0.0	0.0	37%	0.00%
				Home Range	1056.6	298.0	1540.5	36%	1.7	0.6	11.3	13.7	36%	-0.06%
S-10	FC27	81.4	Unknown	Nest Patch	25.4	0.0	44.4	36%	0.1	0.0	0.0	0.1	36%	-0.17%
		(West Cascades)	Male	Core Area	140.1	4.2	358.2	28%	14.0	0.2	13.3	27.5	25%	-2.81%
				Home Range	1082.6	301.8	1510.8	37%	2.9	7.7	40.7	51.3	37%	-0.59%
S-11	BC08	82.7	Pair	Nest Patch	29.7	0.1	40.0	43%	0.0	0.0	0.0	0.0	43%	0.00%
		(West Cascades)	Nesting Status Unknown	Core Area	244.7	33.4	223.9	49%	0.0	0.0	0.0	0.0	49%	0.00%
				Home Range	1243.7	336.9	1314.5	43%	0.0	0.0	0.0	0.0	43%	0.00%
S-12	FC70	83.2	Unknown	Nest Patch	50.6	0.0	19.2	72%	0.0	0.0	0.0	0.0	72%	0.00%
		(West Cascades)	Male	Core Area	342.5	20.2	139.7	68%	0.0	0.0	0.0	0.0	68%	0.00%
				Home Range	1481.6	392.1	1021.4	51%	0.0	0.0	0.0	0.0	51%	0.00%
S-13	CL04	83.0	Unknown	Nest Patch	16.8	19.3	33.8	24%	0.0	0.0	0.0	0.0	24%	0.00%
		(West Cascades)	Male	Core Area	234.9	77.3	190.3	47%	0.0	0.0	0.0	0.0	47%	0.00%
				Home Range	1785.0	275.2	834.9	62%	0.0	0.0	0.0	0.0	62%	0.00%
S-14	FC40	86.1	Resident	Nest Patch	18.7	10.7	40.4	27%	0.0	0.0	0.0	0.0	27%	0.00%
		(West Cascades)	Single Male	Core Area	113.5	83.3	305.7	23%	0.0	0.0	0.0	0.0	23%	0.00%
				Home Range	861.6	406.2	1627.4	30%	0.0	0.0	0.0	0.0	30%	0.00%
S-15	FC02	87	Unknown	Nest Patch	66.9	0.0	2.9	96%	0.0	0.0	0.0	0.0	96%	0.00%
		(West Cascades)	Male	Core Area	341.6	0.0	160.9	68%	0.0	0.0	0.0	0.0	68%	0.00%
				Home Range	1915.2	22.2	957.7	66%	0.0	0.0	0.0	0.0	66%	0.00%
S-16	FC05	88.1	Resident	Nest Patch	38.1	0.0	31.7	55%	0.0	0.0	0.0	0.0	55%	0.00%
		(West Cascades)	Single Male	Core Area	329.0	0.0	173.0	66%	4.9	0.0	7.0	11.9	65%	-0.98%
				Home Range	1963.1	0.1	931.9	68%	9.5	0.0	15.1	24.6	67%	-0.50%
S-17	FC08	87.5	Resident	Nest Patch	27.6	22.7	19.5	40%	0.0	0.0	0.0	0.0	40%	0.00%

TABLE 2.3.1-2 *Revised 030410*

Palomar Gas Transmission Project
Habitat Removal and Effects Determination for Northern Spotted Owl Home Ranges Crossed By the Palomar Project

Owl Pair	MHNF ID or Centroid ID	Milepost (Physiographic Province)	Status	Parameter Evaluated	Suitable (NRF) Habitat (acres)	Dispersal Habitat (acres)	Capable (Replacement) Habitat (acres)	Percent of Owl Circle in Suitable (NRF) Habitat	Suitable (NRF) Habitat Removed (acres)	Dispersal Habitat Removed (acres)	Capable (Replacement) Habitat Removed (acres)	Total Habitat Removed (acres)	Percent in Suitable (NRF) Habitat, Post-construction	Percent Change in Suitable (NRF) Habitat Post-Construction
		(West Cascades)	Single Male	Core Area	190.3	108.1	204.1	38%	0.0	0.0	0.0	0.0	38%	0.00%
				Home Range	1550.2	221.5	1123.4	54%	11.3	0.0	10.7	22.0	53%	-0.39%
Plympton Ridge Owl	Plympton Ridge Owl	210.4 (Coast Range)	Historic	Nest Patch	1.4	68.3	0.1	2%	0.0	0.0	0.0	0.0	2%	0.00%
				Core Area	26.5	382.2	93.8	5%	0.0	0.0	0.0	0.0	5%	0.00%
				Home Range	302.4	2516.9	1701.8	7%	0.0	1.1	10.9	12.0	7%	0.00%

Likely to Adversely Affect Individual Northern Spotted Owls

Percent suitable habitat is below FWS take threshold for Northern Spotted Owl Circles

[a] The nest patch is the 300-meter-radius circle (69.8 acres) around a known or predicted spotted owl site, where a spotted owl would be likely to select a nesting tree. The take threshold is any removal of suitable habitat.

[b] The core area is a 0.5-mile-radius circle (502 acres) around a known or predicted owl site that delineates the area most heavily used by spotted owls during the nesting season. The take threshold is removal of suitable habitat that results in less then 50 percent suitable habitat (250 acres) in the core post-treatment.

[c] The home range area is an estimated area of habitat use by a spotted owl pair. For the Oregon Cascades, this estimate is a 1.2-mile-radius circle (2,894 acres) around a known owl site. For the Oregon Coast Range, this estimate is a 1.5-mile-radius circle (4,521 acres) around a known owl site. The take threshold is removal of suitable habitat that results in less then 40 percent suitable habitat in the home range post-treatment.

ATTACHMENT 6-2

TABLE 2.3.1-1 *Revised 030410*

Palomar Gas Transmission Project
Habitat Removal within the Range of the Northern Spotted Owl [a]

Facility/ County	Suitable (Nesting, Roosting, and Foraging) Habitat							Dispersal Habitat							Capable (Replacement) Habitat						
	USFS							USFS							USFS						
	LSR [b,c]	LSR/ RR [b,c]	Matrix [c]	Matrix/ RR [b,c]	BLM	State	Pri-vate	LSR [b,c]	LSR/ RR [b,c]	Matrix [c]	Matrix/ RR [b,c]	BLM	State	Pri-vate	LSR [b,c]	LSR/ RR [b,c]	Matrix [c]	Matrix/ RR [b,c]	BLM	State	Pri-vate
Cascade Section																					
East Cascades (MPs 37.3-45.9)																					
Wasco	0.0	0.0	11.8	1.3	0.0	0.0	0.0	0.0	0.0	24.8	7.9	0.0	0.0	0.0	0.0	0.0	30.5	0.0	0.0	0.0	0.0
West Cascades (MPs 45.9-103.9)																					
Wasco	0.0	0.0	8.7	5.7	0.0	0.0	0.0	0.0	0.0	59.2	9.8	0.0	0.0	0.0	0.0	0.0	93.0	9.6	0.0	0.0	0.0
Clackamas	8.2	5.5	102.5	49.8	8.6	0.0	0.0	0.0	1.6	52.9	12.8	0.0	0.0	0.0	6.0	6.2	362.1	73.4	6.2	0.0	170.2
Willamette Section																					
Willamette Valley (MPs103.9-176.6)																					
Washington	0	0	0	0	0	0	0	0	0	0	0	0	15	82.9	0	0	0	0	0	10.7	190.4
Coast Range (MPs 176.6-216.9)																					
Washington	0	0	0	0	0	0	0	0	0	0	0	0	6.7	67.9	0	0	0	0	0	1.6	42.7
Columbia	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0	0	0	0	0	0	3
Clatsop	0	0	0	0	0	7.6	0.3	0	0	0	0	0	200.6	68	0	0	0	0	0	110.3	80.7
Total	8.2	5.5	123.0	56.8	8.6	7.6	0.3	0.0	1.6	136.9	30.5	0.0	222.3	245.8	6.0	6.2	485.6	83.1	6.2	122.6	487.0

[a] All areas are measured in acres to the nearest 0.1. Totals may appear incorrect due to rounding.

[b] Late Successional Reserve (LSR), Riparian Reserve (RR); includes Administratively Withdrawn areas.

[c] Results are mutually exclusive except in columns containing two Land Use Allocations where they contain an overlap between the Land Use Allocations.

ATTACHMENT 6-3

ATTACHMENT 6-3

TABLE 1.2.3-1 *Revised 030410*

Palomar Gas Transmission Project
Marbled Murrelet Critical Habitat within the Proposed Project

Critical Habitat Unit Number	Habitat ID	Begin Milepost	End Milepost	Miles Crossed	Acres Within CH Designation	Replacement Habitat (0-39 years)	Recruitment Habitat (40+ years)	Assumed Suitable Habitat	Suitable Habitat (i.e., PCE #1)	Acres of PCE #2	Acres of Overlap of PCE #1 and #2	Total Acres of CH Potentially Impacted	Recruitment Habitat (but not yet PCE #2)
OR-01-d	1324	193.9	199.6	5.7	86.9	35.0	48.6	0.0	3.2	9.2	1.5	10.9	39.2
OR-01-d	1324	200.1	200.4	0.3	3.6	3.6	0.0	0.0	0.0	0.3	0.0	0.3	0.0
OR-01-a	1320	201.0	207.2	6.2	93.2	16.8	70.5	0.0	5.9	9.1	1.0	14.0	61.5
OR-01-a	1318	208.3	211.6	3.3	51.1	9.4	41.7	0.0	0.0	7.5	0.0	7.5	34.3
Total [a]				15.4	234.9	64.8	160.9	0.0	9.1	26.1	2.6	32.6	134.9

[a] Totals may appear incorrect due to rounding.

7. To determine the loss of marbled murrelet habitat that could become suitable in the future, analyze acreages that have the potential to have suitable nest trees over the life of the project based on current stand age for marbled murrelet zones 1 and 2. Additionally, within designated critical habitat, analyze acreages that have the potential to become primary constituent elements (PCE) 1 or PCE 2 over the life of the project.

RESPONSE:

Within the range of the marbled murrelet (Zones 1 and 2), areas within and outside of designated critical habitat have been calculated according to the current conditions and those that are anticipated to occur within the life of the proposed Palomar Project (i.e., 50 years). Within the project area, designated critical habitat occurs only on state lands because the project does not cross any federal lands within the range of the marbled murrelet.

The definitions of the habitat categories used for this analysis are provided below. Table 7-1 provides the requested acreages based on these categories.

Within Non-Critical Habitat:

Suitable Habitat$_{now}$: These are areas of known suitable habitat (potential nest trees with a 300-foot buffer) in the project area.

Assumed Suitable Habitat$_{now}$: Prior to marbled murrelet surveys, PGT identified areas that may contain suitable habitat via aerial photograph interpretation to help direct habitat assessment surveys (i.e., ground-truthing). These estimates were very conservative as stand age was not available to perform this analysis on private lands. In areas where PGT did not obtain landowner permission to survey, these areas are assumed suitable habitat. Since PGT was conservative in the estimate of assumed suitable habitat, verification will be performed during pre-construction surveys. If any potential nest trees are identified during the pre-construction surveys, these areas (within a 300-foot buffer) will be considered Suitable Habitat$_{now}$. If no potential nest trees are found, but the stands are at least 60 years of age at the time of construction as determined by the timber cruise, then these acreages will be considered Suitable Habitat$_{50}$ (see definition below). If any of these stands are found to be younger than 60 years, then they will not be considered able to become suitable habitat within the life of the project.

Suitable Habitat$_{50YRS}$: These are areas that are currently not suitable habitat, but have the potential to become suitable habitat within the life of the project. On Oregon Department of Forestry (ODF) lands, stands that are currently 78 years and older but not yet suitable were used. Within the life of the project, these stands could reach 128 years or older and are likely to start developing nesting structure. On private lands, were stand age was estimated, PGT used a conservative future suitable habitat age of 110 years based on discussions with the U.S. Fish and Wildlife Service (FWS) (FWS, 2010). In 50 years, these trees could reasonably acquire nesting structure (i.e., large limb structures, mistletoe infections). Since PGT does not have stand data for private lands, PGT has identified stands that are roughly 50 to 60 years or older (based on conservative aerial photograph interpretation).

Within Critical Habitat:

Primary Constituent Elements (PCE) 1_{now}: These are areas of already suitable habitat (potential nest trees including a 300-foot buffer) within the project footprint.

PCE 2_{50YRS}: These are areas that are currently not suitable habitat but could potentially become PCE #2 (half-site potential trees) within the life of the project. Based on the original consultation and calculations for PCE #2 for the project, forest stands were defined as PCE #2 if they were 78 years or older using a half-site potential tree height (100 feet) and age/growth rates for the area (McArdle et al., 1961). Using ODF stand data, PGT conservatively calculated PCE 2_{50YRS} by using trees that are currently 28 to 77 years old.

PCE 1_{50YRS}: These are areas of trees that could become potential nest trees within the life of the project. PCE 2_{now} stands will be developing into PCE 1_{50YRS} stands. Using ODF stand data, PCE 2_{now} and PCE1_{50YRS} acres were both calculated using stands that are currently 78 years and older and not yet suitable. Within the life of the project, these stands would reach 128 years and older and are likely to start developing nesting structure.

TABLE 7-1

Palomar Gas Transmission Project
Marbled Murrelet Suitable Habitat - Current and Within Life of Project

		Non-Critical Habitat (acres)						Critical Habitat (acres)		
		Suitable $Habitat_{now}$		Assumed Suitable $Habitat_{now}$		Suitable $Habitat_{50}$		PCE 1_{now}	PCE 1_{50}	PCE 2_{50}
Zone	County	State	Private	State	Private	State	Private	State[a]	State	State
2	Marion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Yamhill	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Yamhill	0.0	0.0	0.0	9.3	0.0	2.7	0.0	0.0	0.0
1	Washington	0.0	1.8	0.0	67.8	0.0	96.9	0.0	0.0	0.0
1	Columbia	0.0	0.0	0.0	0.0	0.0	15.6	0.0	0.0	0.0
1	Clatsop	0.0	0.0[b]	0.0	16.2	4.5	31.4	9.1	26.1	150.4
	Total	0.0	1.8	0.0	93.4	4.5	146.5	9.1	26.1	150.4

[a] Designated critical habitat only occurs on state lands associated with the proposed project.

[b] Previous tables have reported 1.2 acres of suitable habitat within private land in Clatsop County, which represented one potential nest tree. This potential nest tree has been removed since it does not meet the habitat definition of a potential nest tree within non-critical habitat (see also the response to data request #5).

References

McArdle, R. E., W. H. Meyer and D. Bruce. 1961 (revised). The Yield of Douglas-fir in the Pacific Northwest. U.S. Department of Agriculture, U.S. Forest Service. Pacific northwest Forest and Range Experiment Station, Portland OR, Technical Bulletin 201.

U.S. Fish and Wildlife Service (FWS). 2010. Telephone conversation on February 23, between B. Tuerler (FWS) and I. Larsson (Natural Resource Group, LLC).

Response by: John Cassady, Palomar Gas Transmission, LLC, (503) 833-4703

8. Identify potential impacts to federally-listed terrestrial species and their designated critical habitat resulting from implementation of the Maupin Waterline and Warm Springs Alternatives. For the northern spotted owl, address acreages impacted by age category and habitat type (NRF, dispersal, and replacement), owl home ranges, and any AOCs crossed by the alternative routes. Provide all the information for these alternatives that was provided for the proposed route.

RESPONSE:

The northern spotted owl is the only federally listed terrestrial species with the potential to occur or be affected by these alternatives. A specific discussion for each alternative is provided below.

Maupin Waterline Alternative

There is no suitable habitat for northern spotted owls along the Maupin Waterline Alternative. Therefore, no new or additional analyses for federally listed terrestrial species are required for this alternative. Although no federally listed species are affected, PGT did conduct general biological surveys along this alternative. The Maupin Alternative General Biological Survey Report for Sensitive Species and Noxious Weeds is provided under separate cover ("Privileged and Confidential - Do Not Release") as Attachment 8-1 in Volume II of this data request response.

In addition, if the Maupin Waterline Alternative was incorporated into the proposed route, several revisions would be required to the project description included in Section 2, Volume I of the Applicant-prepared Draft Biological Assessment (ADBA) provided in June 2009. The information needed to make those revisions is included below along with an index indicating where in the ADBA the revisions are required.

Project Description

INDEX Maupin Waterline Alternative	
Information Provided in this Response	Information in the current ADBA to be Revised/Replaced
Table 8-MW-1	Replaces table 2.1-1
Table 8-MW-2	Information needed to revise section 2.1.1.2
Table 8-MW-3	Information needed to revise section 2.1.1.3
Figure 8-1	Replaces figure 2.1.1-1
Table 8-MW-4	Replaces table 2.1.1-1
Table 8-MW-5	Replaces table 2.1.2-1
Table 8-MW-6	Replaces table 2.1.2-2

TABLE 8-MW-1

Palomar Gas Transmission Project
Proposed Pipeline Facilities Assuming Incorporation of the Maupin Waterline Alternative [a]

Facility/County	Pipeline Diameter (inches)	Approximate Mileposts		Length (miles)
		Begin	End	
MAINLINE				
Cascade Section				
Wasco County [b]	36	0.0	55.1	53.2
Clackamas County	36	55.1	111.2	56.1
Cascade Section Subtotal				109.3
Willamette Section				
Clackamas County	36	111.2	118.7	7.5
Marion County	36	118.7	133.4	14.7
Yamhill County	36	133.4	156.3	22.9
Washington County	36	156.3	184.1	27.8
Columbia County	36	184.1	186.1	2.0
Clatsop County	36	186.1	216.9	30.8
Willamette Section Subtotal				105.7
Mainline Subtotal				215.0
MOLALLA LATERAL				
Clackamas County	24	0.0	3.8	3.8
Molalla Lateral Subtotal				3.8
Project Total				218.8

[a] Due to rounding, crossing lengths may not reflect the total obtained by subtracting the end milepost from the beginning milepost.

[a] The Maupin Waterline Alternative joins the proposed route at milepost 24.3 (i.e., 1.9 miles shorter than corresponding segment). As a result, the crossing length in Clackamas County does not reflect the mileage difference between the beginning and ending milepost.

TABLE 8-MW-2

Palomar Gas Transmission Project
Summary of Land Ownership Assuming Incorporation of the Maupin Waterline Alternative [a]

Facility/ Ownership	Approximate Crossing Length (miles)	Percent of Total Project Length
MAINLINE		
Cascade Section		
U.S. Forest Service [b]	48.0	21.9
Bureau of Land Management [b]	1.6	0.7
Warm Springs Reservation Lands	0.0	0.0
Oregon Department of Fish and Wildlife	0.8	0.4
Private	58.9	26.9
Subtotal	109.3	50.0
Willamette Section		
Oregon Department of Forestry	23.1	10.6
Private	82.6	37.8
Subtotal	105.7	48.3
MOLALLA LATERAL		
Private	3.8	1.7
Subtotal	3.8	1.7
Project Total	218.8	100

[a] The numbers in this table have been rounded for presentation purposes.
[b] PGT has applied for a right-of-way grant to cross federal lands.

TABLE 8-MW-3

Palomar Gas Transmission Project
Existing Rights-of-Way Paralleled by the Pipeline Assuming Incorporation of the Maupin Waterline Alternative

Begin Milepost	End Milepost	Length (miles)[a]	Type of Right-of-Way
MAINLINE			
Cascade Section			
2.8a	6.3a	3.5	Hwy 197
7.7a	11.6a	3.9	Hwy 197
12.3a	15.7a	3.4	Hwy 197
16.4a	17.6a	1.2	Hwy 197
18.3a	19.8a	1.5	Hwy 197
20.9a	21.0a	0.1	Unknown Road
21.7a	22.4a	0.7	Old Wapinitia Road
24.2	29.2	5.0	Hwy 216
29.2	30.3	2.3	Kelly Cutoff Road
30.9	33.8	3.0	Claymier Land & Victor Road
34.0	38.5	4.5	Transmission Line
39.0	39.1	0.2	Jeep Trail
40.0	40.3	0.3	Unknown Road
40.8	41.0	0.2	Unknown Road
43.4	43.7	0.3	South 509e Road
44.3	44.5	0.3	Unknown Road
45.5	45.6	0.2	Unknown Road
45.8	46.4	0.6	Unknown Road
46.8	50.6	3.8	Hwy 216 & Hwy 26
52.2	52.4	0.2	Unknown Road
52.5	53.0	0.4	South 42 Road
58.2	58.5	0.2	Unknown Road
70.2	70.8	0.6	Unknown Road
73.6	74.8	1.2	National Forest Developed Road 5710
75.3	75.5	0.3	National Forest Developed Road 5710
76.9	77.2	0.3	Unknown Road
80.5	81.0	0.4	Unknown Road
81.9	82.1	0.2	National Forest Developed Road 210
82.3	83.2	0.9	Unknown Road
83.6	83.9	0.3	National Forest Developed Road 5420 and Unknown Spur
84.3	84.4	0.1	Spur of National Forest Developed Road 5420
84.7	86.2	1.5	National Forest Developed Road 5440
87.5	87.6	0.1	Unknown Road
88.1	88.8	0.6	National Forest Developed Road 4550
89.8	90.0	0.2	National Forest Developed Road 4540
90.5	90.9	0.4	National Forest Developed Road 4530
91.0	91.1	0.1	National Forest Developed Road 4530
92.2	92.5	0.2	Unknown Road
92.7	93.3	0.5	Unknown Road and Timothy Patch Road
94.6	94.9	0.2	Unknown Road

TABLE 8-MW-3

Palomar Gas Transmission Project
Existing Rights-of-Way Paralleled by the Pipeline Assuming Incorporation of the Maupin Waterline Alternative

Begin Milepost	End Milepost	Length (miles)[a]	Type of Right-of-Way
94.9	95.0	0.1	119th Road
96.2	96.7	0.5	Williams Lake Road
99.9	100.1	0.2	Williams Lake Road
100.2	104.0	2.9	Williams Lake Road and Upper Molalla Forest Road
106.7	107.6	0.9	South Herman Road
	Cascade Section Subtotal	48.5	
Willamette Section			
111.6	112.3	0.7	South Mount Hope Road
114.7	114.9	0.2	Unknown Road
114.9	115.3	0.4	Unknown Road & Railroad
115.8	117.0	1.2	South Newman Road
141.6	145.3	3.8	Railroad & Transmission Line
145.6	147.6	2.0	Transmission Line
148.5	149.7	1.2	NE Withycomb Road and NE Yamhill Road
151.9	155.1	3.2	Transmission Line
156.2	158.1	2.0	Transmission Line
159.4	160.3	0.9	Unknown Road
160.4	160.9	0.5	Unknown Road
162.1	162.4	0.3	SW Chanterelle Drive
162.8	164.5	1.7	SW Carpenter Creek Road
164.6	166.0	1.3	Unknown Road
166.6	167.1	0.4	Unknown Road
167.4	167.5	0.1	Unknown Road
170.0	171.8	1.7	Transmission Line
172.7	173.0	0.3	Unknown Road
173.1	180.9	7.8	Transmission Line
182.3	182.4	0.2	Wolf Creek Road
182.6	183.8	1.3	Hwy 26 and Sunset Grade Road
184.1	184.6	0.5	Sunset Grade Road
184.9	186.1	1.2	Sunset Grade Road
186.4	188.4	2.1	Nofo Road
189.5	190.1	0.6	Unknown Road
191.2	191.3	0.1	Ginger Creek Mainline
195.0	197.7	2.7	Buster Road and Sager Creek Road
198.2	198.7	0.4	Sager Creek Road
199.2	199.6	0.4	Unknown Road
200.1	200.3	0.2	Spur of East Sager Creek Road
201.4	203.3	1.9	Unknown Road
203.4	204.9	1.6	Unknown Road
205.4	206.2	0.8	Greasy Spoon Road
207.1	207.4	0.3	Greasy Spoon Road
207.7	207.8	0.2	Greasy Spoon Road
210.0	210.4	0.4	Unknown Road

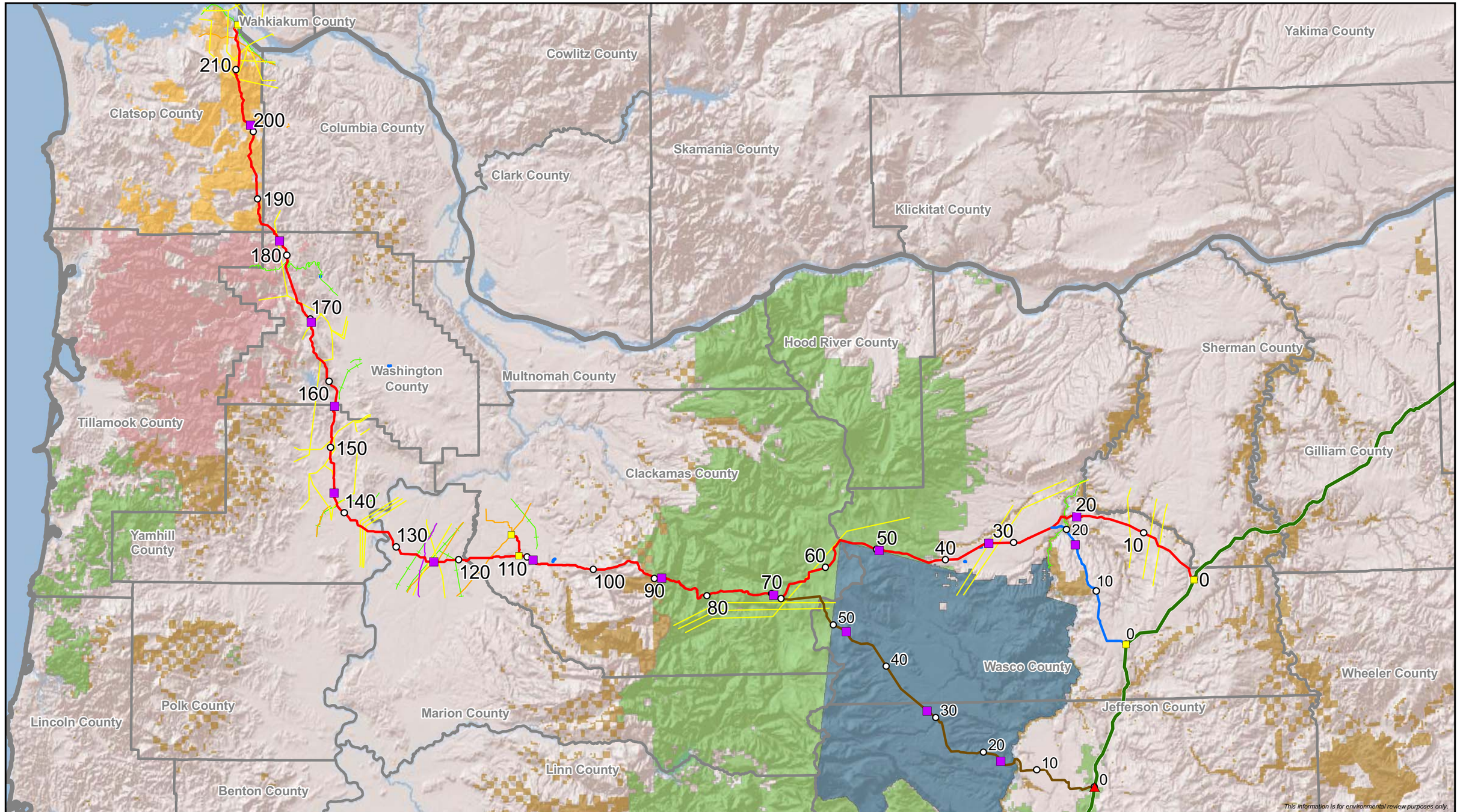
TABLE 8-MW-3

Palomar Gas Transmission Project
Existing Rights-of-Way Paralleled by the Pipeline Assuming Incorporation of the Maupin Waterline Alternative

Begin Milepost	End Milepost	Length (miles)[a]	Type of Right-of-Way
213.9	215.4	1.5	Unknown Road and Transmission Line
	Willamette Section Subtotal	46.1	
	Mainline Subtotal	94.6	
MOLALLA LATERAL			
0.0	0.7	0.7	South Palmer Road
1.0	1.4	0.4	South Palmer Road
	Molalla Lateral Subtotal	1.1	
Project Total		95.7	

[a] The numbers in this table have been rounded for presentation purposes.

a = Maupin Waterline Alternative Milepost



- Milepost
- Meter Station/Mainline Valve
- Mainline Valve
- Compressor Station/Meter Station/Mainline Valve
- Proposed Route
- GTN Mainline
- Products Pipeline
- Electric Transmission Line
- Natural Gas Pipeline
- Railroad
- Maupin Alternative
- Warm Springs Alternative
- Contractor Yards
- Bureau of Land Management
- Clatsop State Forest
- Tillamook State Forest
- U.S. Forest Service
- Warm Springs Reservation

0 10 20 Miles

N

palomar

Figure 2.1.1-1
Palomar Gas Transmission Project
Land Ownership Overview

NATURAL RESOURCE GROUP

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TABLE 8-MW-4

Palomar Gas Transmission Project
Summary of Pipeline Facilities Land Requirements Assuming Incorporation of the Maupin Waterline Alternative

Facility	Approximate Milepost(s)	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Pipeline Right-of-Way			
Cascade Section [a]	0.0 to 111.2	1,479.7	504.7
Willamette Section [a]	111.2 to 216.9	1,490.3	426.0
Molalla Lateral [b]	111.2	45.4	20.1
Pipeline Right-of-Way Subtotal		3,015.4	950.8
Additional Temporary Workspace Areas	Various		
Cascade Section		80.5	0.0
Willamette Section		103.1	0.0
Molalla Lateral		3.2	0.0
Additional Temporary Workspace Subtotal		186.8	0.0
Pipe and Contractor Yards		91.6	0.0
Access Roads		50.8	2.5
Total		3,344.6	953.3

[a] Based on a 120-foot-wide construction right-of-way, except in wetlands where a 75-foot-wide construction right-of-way will be used. Operation acreage is based on a 50-foot-wide permanent right-of-way, except in areas where only 23 feet will be permanently maintained (forested areas and in most specialty agricultural fields (i.e., Christmas tree farms, nurseries, cane fruit, orchards, vineyards)).

[b] Based on a 100-foot-wide construction right-of-way, except in wetlands where a 75-foot-wide construction right-of-way will be used. Operation acreage is based on a 50-foot-wide permanent right-of-way, except in areas where only 23 feet will be permanently maintained (forested areas and in most specialty agricultural fields (i.e., Christmas tree farms, nurseries, cane fruit, orchards, vineyards)).

TABLE 8-MW-5

Palomar Gas Transmission Project
Proposed Aboveground Facilities Assuming Incorporation of the Maupin Waterline Alternative [a]

Facility Name	Approximate Milepost [b]	Location	County	Landowner
METER STATIONS				
Cascade Section				
Maupin Alternative Meter Station	0.0a	Sec. 27, T7S, R15E	Wasco	Private
Willamette Section				
Bradwood Landing Meter Station	216.9	Sec.9, T8N, R6W	Clatsop	Private
Molalla Lateral				
Molalla Meter Station	3.8	Sec. 35, T4S, R1E	Clackamas	Private
MAINLINE VALVES (MLV)				
Cascade Section				
MLV #1	0.0a	Sec. 27, T7S, R15E	Wasco	Private
MLV #2	17.6a	Sec. 15, T5S, R14E	Wasco	Private
MLV #3	33.5	Sec. 9, T5S, R12E	Wasco	Private
MLV #4	49.6	Sec. 13, T5S, R9E	Wasco	U.S. Forest Service (USFS)
MLV #5	69.7	Sec. 13, T6S, R7E	Clackamas	USFS
MLV #6	88.8	Sec. 5, T6S, R5E	Clackamas	USFS
MLV #7	109.1	Sec. 20, T5S, R2E	Clackamas	Private
Willamette Section				
MLV #8	123.6	Sec. 24, T5S, R2W	Marion	Private
MLV #9	143.3	Sec. 2, T4S, R4W	Yamhill	Private
MLV #10	156.1	Sec. 2, T2S, R4W	Yamhill	Private
MLV #11	169.6	Sec. 6, T1N, R4W	Washington	Private
MLV #12	182.5	Sec. 9, T3N, R5W	Washington	Private
MLV #13	201.0	Sec. 23, T6N, R6W	Clatsop	Oregon Department of Forestry
MLV #14	216.9	Sec. 9, T8N, R6W	Clatsop	Private
Molalla Lateral				
MLV #15	0.0	Sec. 13, T5S, R1E	Clackamas	Private
MLV #16	3.8	Sec. 35, T4S, R1E	Clackamas	Private
TAP VALVE				
Molalla Lateral				
Valve #1	3.8	Sec. 35, T4S, R1E	Clackamas	Private
PIG LAUNCHERS AND RECEIVERS				
Cascade Section				
Launcher/Receiver Site	0.0a	Sec. 27, T7S, R15E	Wasco	Private
Willamette Section				
Launcher/Receiver Site	216.9	Sec. 9, T8N, R6W	Clatsop	Private
Molalla Lateral				
Launcher/Receiver Site	0.0	Sec. 13, T5S, R1E	Clackamas	Private
Launcher/Receiver Site	3.8	Sec. 35, T4S, R1E	Clackamas	Private

[a] Locations of aboveground facility sites are preliminary and subject to change.

a = Maupin Waterline Alternative Milepost

TABLE 8-MW-6

Palomar Gas Transmission Project
Land Requirements for Aboveground Facilities Assuming Incorporation of the Maupin Waterline Alternative

Facility	Milepost	Land Disturbed During Construction (acres)	Land Disturbed by Operation (acres)	County
METER STATIONS				
Cascade Section				
Maupin Alternative Meter Station	0.0a	5.7	5.7	Wasco
Willamette Section				
Bradwood Landing Meter Station	216.9	0.3	0.3	Clatsop
Molalla Lateral				
Molalla Meter Station	3.8	0.6	0.6	Clackamas
Subtotal		6.6	6.6	
VALVES AND OTHER FACILITIES				
Cascade Section				
7 Mainline Valve Sites	Various [a]	0.0	0.0	Wasco, Clackamas
1 Pig Launcher/Receiver Site	0.0a [b]	0.0	0.0	Wasco
Willamette Section				
7 Mainline Valve Sites	Various [a]	0.0	0.0	Marion, Yamhill, Washington, Clatsop
1 Pig Launcher/Receiver Site	216.9 [b]	0.0	0.0	Clatsop
Molalla Lateral				
2 Mainline Valve Sites	0.0, 3.8 [a]	0.0	0.0	Clackamas
Tap Valve Site	3.8	0.1	0.1	Clackamas
2 Pig Launcher/Receiver Sites	0.0 [c], 3.8 [b]	0.3	0.3	Clackamas
Subtotal		0.4	0.4	
Project Total		7.0	7.0	

[a] Each mainline valve will be constructed within the 120-foot-wide or 100-foot-wide construction right-of-way and operated within the 50-foot-wide permanent easement or within the area associated with a meter station and will not require any additional land for construction or operation.

[b] These pig launcher/receiver sites will be constructed and operated within the area associated with a meter station and will not require any additional land for construction or operation.

[c] This pig launcher/receiver site will be constructed at the beginning of the Molalla Lateral in an area not associated with a proposed meter station.

a = Maupin Waterline Alternative Milepost

Warm Springs Alternative

If the Warm Springs Alternative were incorporated into the proposed route, several revisions would be required to the project description included in Section 2, Volume I of the ADBA. The information needed to make those revisions is included below along with an index indicating where in the ADBA the revisions are required. In addition, because this alternative crosses suitable northern spotted owl habitat, the analysis included in Section 2.0 of Volume II of the ADBA would also need to be revised. The information needed to revise that section is also provided below. Northern spotted owl overview maps for the Warm Springs Alternative are provided as part of the response to data request #5.

PGT also conducted general biological surveys along this alternative. The Warm Springs Alternative General Biological Survey Report for Sensitive Species and Noxious Weeds is provided under separate cover ("Privileged and Confidential - Do Not Release") as Attachment 8-2 in Volume II of this data request response.

Project Description

INDEX

Warm Springs Alternative

Information Provided in this Response	Information in the current ADBA to be Revised/Replaced
Table 8-WS-1	Replaces table 2.1-1
Table 8-WS-2	Information needed to revise section 2.1.1.2
Table 8-WS-3	Information needed to revise section 2.1.1.3
Figure 8-1 [a]	Replaces figure 2.1.1-1
Table 8-WS-4	Replaces table 2.1.1-1
Table 8-WS-5	Replaces table 2.1.2-1
Table 8-WS-6	Replaces table 2.1.2-2

[a] This is the same figure as that provided for the Maupin Waterline Alternative.

TABLE 8-WS-1

Palomar Gas Transmission Project
Proposed Pipeline Facilities Assuming Incorporation of the Warm Springs Alternative [a]

Facility/County	Pipeline Diameter (inches)	Approximate Mileposts		Length (miles)
		Begin	End	
MAINLINE				
Cascade Section				
Jefferson County	36	0.0	33.2	33.2
Wasco County	36	33.2	54.3	21.0
Clackamas County [b]	36	54.3	111.2	48.5
Cascade Section Subtotal				102.7
Willamette Section				
Clackamas County	36	111.2	118.7	7.5
Marion County	36	118.7	133.4	14.7
Yamhill County	36	133.4	156.3	22.9
Washington County	36	156.3	184.1	27.8
Columbia County	36	184.1	186.1	2.0
Clatsop County	36	186.1	216.9	30.8
Willamette Section Subtotal				105.7
Mainline Subtotal				208.4
MOLALLA LATERAL				
Clackamas County	24	0.0	3.8	3.8
Molalla Lateral Subtotal				3.8
Project Total				212.2

[a] Due to rounding, crossing lengths may not reflect the total obtained by subtracting the end milepost from the beginning milepost.

[b] The Warm Springs Alternative joins the proposed route at milepost 69.0 (i.e., approximately 8.5 miles shorter than corresponding segment). As a result, the crossing length in Clackamas County does not reflect the mileage difference between the beginning and ending milepost.

TABLE 8-WS-2

Palomar Gas Transmission Project
Summary of Land Ownership Assuming Incorporation of the Warm Springs Alternative [a]

Facility/ Ownership	Approximate Crossing Length (miles)	Percent of Total Project Length
MAINLINE		
Cascade Section		
U.S. Forest Service [b]	33.3	15.7
Bureau of Land Management [b]	1.6	0.8
Warm Springs Reservation Lands	36.0	17.0
Oregon Department of Fish and Wildlife	0.0	0.0
Private	31.8	15.0
Subtotal	102.7	48.4
Willamette Section		
Oregon Department of Forestry	23.1	10.9
Private	82.6	38.9
Subtotal	105.7	49.8
MOLALLA LATERAL		
Private	3.8	1.8
Subtotal	3.8	1.8
Project Total	212.2	100

[a] The numbers in this table have been rounded for presentation purposes.
[b] PGT has applied for a right-of-way grant to cross federal lands.

TABLE 8-WS-3

Palomar Gas Transmission Project
Existing Rights-of-Way Paralleled by the Pipeline Assuming Incorporation of the Warm Springs Alternative

Begin Milepost	End Milepost	Length (miles)[a]	Type of Right-of-Way
MAINLINE			
Cascade Section			
0.0a	3.5a	3.5	Pipeline
3.8a	4.5a	0.7	Grimm Drive
5.2a	7.0a	1.8	Cherry Lane
8.0a	8.7a	0.7	Hwy 26
8.9a	9.9a	1.0	Unknown Road east of Columbia Drive
10.4a	10.9a	0.5	Unknown Road east of Deschutes Drive
12.2a	13.0a	0.8	Utility line
19.6a	20.9a	1.3	Tenino Bench-P-210
24.6a	25.7a	1.1	Utility line
43.4a	44.1a	0.7	Unknown Road
46.2a	48.0a	1.8	Badger Creek Access
48.1a	48.3a	0.2	Unknown Road
51.6a	54.6a	3.0	Skyline Road/NF Road 42
54.6a	58.8a	4.2	BPA Utility line
70.2	70.8	0.6	Unknown Road
73.6	74.8	1.2	National Forest Developed Road 5710
75.3	75.5	0.3	National Forest Developed Road 5710
76.9	77.2	0.3	Unknown Road
80.5	81.0	0.4	Unknown Road
81.9	82.1	0.2	National Forest Developed Road 210
82.3	83.2	0.9	Unknown Road
83.6	83.9	0.3	National Forest Developed Road 5420 and Unknown Spur
84.3	84.4	0.1	Spur of National Forest Developed Road 5420
84.7	86.2	1.5	National Forest Developed Road 5440
87.5	87.6	0.1	Unknown Road
88.1	88.8	0.6	National Forest Developed Road 4550
89.8	90.0	0.2	National Forest Developed Road 4540
90.5	90.9	0.4	National Forest Developed Road 4530
91.0	91.1	0.1	National Forest Developed Road 4530
92.2	92.5	0.2	Unknown Road
92.7	93.3	0.5	Unknown Road and Timothy Patch Road
94.6	94.9	0.2	Unknown Road
94.9	95.0	0.1	119th Road
96.2	96.7	0.5	Williams Lake Road
99.9	100.1	0.2	Williams Lake Road
100.2	104.0	2.9	Williams Lake Road and Upper Molalla Forest Road
106.7	107.6	0.9	South Herman Road
	Cascade Section Subtotal	34.0	
Willamette Section			
111.6	112.3	0.7	South Mount Hope Road

TABLE 8-WS-3

Palomar Gas Transmission Project
Existing Rights-of-Way Paralleled by the Pipeline Assuming Incorporation of the Warm Springs Alternative

Begin Milepost	End Milepost	Length (miles)[a]	Type of Right-of-Way
114.7	114.9	0.2	Unknown Road
114.9	115.3	0.4	Unknown Road & Railroad
115.8	117.0	1.2	South Newman Road
141.6	145.3	3.8	Railroad & Transmission Line
145.6	147.6	2.0	Transmission Line
148.5	149.7	1.2	NE Withycomb Road and NE Yamhill Road
151.9	155.1	3.2	Transmission Line
156.2	158.1	2.0	Transmission Line
159.4	160.3	0.9	Unknown Road
160.4	160.9	0.5	Unknown Road
162.1	162.4	0.3	SW Chanterelle Drive
162.8	164.5	1.7	SW Carpenter Creek Road
164.6	166.0	1.3	Unknown Road
166.6	167.1	0.4	Unknown Road
167.4	167.5	0.1	Unknown Road
170.0	171.8	1.7	Transmission Line
172.7	173.0	0.3	Unknown Road
173.1	180.9	7.8	Transmission Line
182.3	182.4	0.2	Wolf Creek Road
182.6	183.8	1.3	Hwy 26 and Sunset Grade Road
184.1	184.6	0.5	Sunset Grade Road
184.9	186.1	1.2	Sunset Grade Road
186.4	188.4	2.1	Nofo Road
189.5	190.1	0.6	Unknown Road
191.2	191.3	0.1	Ginger Creek Mainline
195.0	197.7	2.7	Buster Road and Sager Creek Road
198.2	198.7	0.4	Sager Creek Road
199.2	199.6	0.4	Unknown Road
200.1	200.3	0.2	Spur of East Sager Creek Road
201.4	203.3	1.9	Unknown Road
203.4	204.9	1.6	Unknown Road
205.4	206.2	0.8	Greasy Spoon Road
207.1	207.4	0.3	Greasy Spoon Road
207.7	207.8	0.2	Greasy Spoon Road
210.0	210.4	0.4	Unknown Road
213.9	215.4	1.5	Unknown Road and Transmission Line
	Willamette Section Subtotal	46.1	
	Mainline Subtotal	80.1	
MOLALLA LATERAL			
0.0	0.7	0.7	South Palmer Road
1.0	1.4	0.4	South Palmer Road
	Molalla Lateral Subtotal	1.1	

TABLE 8-WS-3

Palomar Gas Transmission Project
Existing Rights-of-Way Paralleled by the Pipeline Assuming Incorporation of the Warm Springs Alternative

Begin Milepost	End Milepost	Length (miles)[a]	Type of Right-of-Way
Project Total		81.2	

[a] The numbers in this table have been rounded for presentation purposes.

a = Warm Springs Alternative Milepost

TABLE 8-WS-4

Palomar Gas Transmission Project
Summary of Pipeline Facilities Land Requirements Assuming Incorporation of the Warm Springs Alternative

Facility	Approximate Milepost(s)	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Pipeline Right-of-Way			
Cascade Section [a]	0.0 to 111.2	1,389.4	519.1
Willamette Section [a]	111.2 to 216.9	1,490.3	426.0
Molalla Lateral [b]	111.2	45.4	20.1
Pipeline Right-of-Way Subtotal		2,925.1	965.2
Additional Temporary Workspace Areas	Various		
Cascade Section		105.6	0.0
Willamette Section		103.1	0.0
Molalla Lateral		3.2	0.0
Additional Temporary Workspace Subtotal		211.9	0.0
Pipe and Contractor Yards		91.6	0.0
Access Roads		42.9	1.4
Total		3,271.5	966.6

TABLE 8-WS-5

Palomar Gas Transmission Project
Proposed Aboveground Facilities Assuming Incorporation of the Warm Springs Alternative [a]

Facility Name	Approximate Milepost [b]	Location	County	Landowner
COMPRESSOR STATIONS				
Cascade Section				
Warm Springs Alternative Compressor Station	0.0a	Sec. 35, T10S, R14E	Jefferson	USFS
METER STATIONS				
Cascade Section				
Warm Springs Alternative Meter Station	0.0a	Sec. 35, T10S, R14E	Jefferson	USFS
Willamette Section				
Bradwood Landing Meter Station	216.9	Sec.9, T8N, R6W	Clatsop	Private
Molalla Lateral				
Molalla Meter Station	3.8	Sec. 35, T4S, R1E	Clackamas	Private
MAINLINE VALVES (MLV)				
Cascade Section				
MLV #1	0.0a	Sec. 35, T10S, R14E	Jefferson	USFS
MLV #2	17.1a	Sec. 14, T10S, R12E	Jefferson	Tribal
MLV #3	31.6a	Sec. 12, T9S, R10E	Jefferson	Tribal
MLV #4	48.0a	Sec. 7, T7S, R9E	Wasco	Tribal
MLV #5	69.7	Sec. 13, T6S, R7E	Clackamas	USFS
MLV #6	88.8	Sec. 5, T6S, R5E	Clackamas	USFS
MLV #7	109.1	Sec. 20, T5S, R2E	Clackamas	Private
Willamette Section				
MLV #8	123.6	Sec. 24, T5S, R2W	Marion	Private
MLV #9	143.3	Sec. 2, T4S, R4W	Yamhill	Private
MLV #10	156.1	Sec. 2, T2S, R4W	Yamhill	Private
MLV #11	169.6	Sec. 6, T1N, R4W	Washington	Private
MLV #12	182.5	Sec. 9, T3N, R5W	Washington	Private
MLV #13	201.0	Sec. 23, T6N, R6W	Clatsop	Oregon Department of Forestry
MLV #14	216.9	Sec. 9, T8N, R6W	Clatsop	Private
Molalla Lateral				
MLV #15	0.0	Sec. 13, T5S, R1E	Clackamas	Private
MLV #16	3.8	Sec. 35, T4S, R1E	Clackamas	Private
TAP VALVE				
Molalla Lateral				
Valve #1	3.8	Sec. 35, T4S, R1E	Clackamas	Private
PIG LAUNCHERS AND RECEIVERS				
Cascade Section				
Launcher/Receiver Site	0.0a	Sec. 35, T10S, R14E	Jefferson	USFS
Willamette Section				
Launcher/Receiver Site	216.9	Sec. 9, T8N, R6W	Clatsop	Private
Molalla Lateral				

TABLE 8-WS-5

Palomar Gas Transmission Project
Proposed Aboveground Facilities Assuming Incorporation of the Warm Springs Alternative [a]

Facility Name	Approximate Milepost [b]	Location	County	Landowner
Launcher/Receiver Site	0.0	Sec. 13, T5S, R1E	Clackamas	Private
Launcher/Receiver Site	3.8	Sec. 35, T4S, R1E	Clackamas	Private

[a] Locations of aboveground facility sites are preliminary and subject to change.

a = Warm Springs Alternative Milepost

TABLE 8-WS-6

Palomar Gas Transmission Project
Land Requirements for Aboveground Facilities Assuming Incorporation of the Warm Springs Alternative

Facility	Milepost	Land Disturbed During Construction (acres)	Land Disturbed by Operation (acres)	County
COMPRESSOR STATION				
Cascade Section				
Warm Springs Alternative	0.0a	6.4	6.4	Jefferson
Compressor Station				
METER STATIONS				
Cascade Section				
Warm Springs Alternative	0.0a [b]	0.0	0.0	Jefferson
Meter Station				
Willamette Section				
Bradwood Landing Meter Station	216.9	0.3	0.3	Clatsop
Molalla Lateral				
Molalla Meter Station	3.8	0.6	0.6	Clackamas
Subtotal		7.3	7.3	
VALVES AND OTHER FACILITIES				
Cascade Section				
7 Mainline Valve Sites	Various [a]	0.0	0.0	Jefferson, Wasco, Clackamas
1 Pig Launcher/Receiver Site	0.0 [b]	0.0	0.0	Jefferson
Willamette Section				
7 Mainline Valve Sites	Various [a]	0.0	0.0	Marion, Yamhill, Washington, Clatsop
1 Pig Launcher/Receiver Site	216.9 [b]	0.0	0.0	Clatsop
Molalla Lateral				
2 Mainline Valve Sites	0.0, 3.8 [a]	0.0	0.0	Clackamas
Tap Valve Site	3.8	0.1	0.1	Clackamas
2 Pig Launcher/Receiver Sites	0.0 [c], 3.8 [b]	0.3	0.3	Clackamas
Subtotal		0.4	0.4	
Project Total		7.7	7.7	

[a] Each mainline valve will be constructed within the 120-foot-wide or 100-foot-wide construction right-of-way and operated within the 50-foot-wide permanent easement or within the area associated with a meter station and will not require any additional land for construction or operation.

[b] These aboveground facility sites will be constructed and operated within the area associated with a meter station or compressor station and will not require any additional land for construction or operation.

[c] This pig launcher/receiver site will be constructed at the beginning of the Molalla Lateral in an area not associated with a proposed meter station.

a = Warm Springs Alternative Milepost

Northern Spotted Owl *[information needed to revise Section 2, Volume II of June 2009 ADBA]*

The Warm Springs Alternative crosses suitable northern spotted owl habitat from approximately alternative milepost (MP) 37.5 to its junction with the currently proposed pipeline right-of-way at MP 60.3 (MP 69 of the proposed route). No designated critical habitat (as designated in 2008) or Areas of Concern are crossed by the Warm Springs Alternative.[4]

PGT is conducting spotted owl surveys along the Warm Springs Alternative following the 2-year survey protocol outlined in the FWS-endorsed *Protocol for Surveying Proposed Management Activities that May Impact Northern Spotted Owls*. The first year of surveys was completed in 2009. The Warm Springs Alternative Year 1 Northern Spotted Owl Survey Report is provided under separate cover ("Privileged and Confidential - Do Not Release") as Attachment 8-3 in Volume II of this data request response.

The overall analysis and determination of effect for the northern spotted owl (i.e., *likely to adversely affect*), as presented in Section 2, Volume II of the ADBA, would not change if the Warm Springs Alternative was incorporated into the proposed route. However, several tables would need to be revised. The following tables from Section 2.0, Volume II of the ADBA have been included below for the Warm Springs Alternative:

- table 2.2.2-1;
- table 2.2.2-2;
- table 2.3.1-1;
- table 2.3.1-2; and
- table 2.3.1-4.

The construction timeframes (i.e., months within the year) would be the same for the Warm Springs Alternative as for the corresponding segment of the proposed route. Therefore, the information presented in table 2.3.1-3 for the proposed route is still applicable and no revisions are required at this time.

TABLE 2.2.2-1

Palomar Gas Transmission Project
Acres of Northern Spotted Owl Habitat Within the Action Area of the Warm Springs Alternative Segment[a]

	Available Suitable Habitat Within 1 Mile of the Construction Corridor (Acres)		
Physiographic Province/County	Suitable Habitat	Dispersal Only	Non-Suitable Habitat
MAINLINE			
Eastern Cascades (MPs 24.8-44.9) [b]			
Jefferson	34.9	23.1	115.4
Wasco	6,628.02	2,312.53	7,226.92
Western Cascades (MPs 44.9-60.3) [b]			
Wasco	3,534.9	1,233.3	3,854.4
Clackamas	6,105.0	683.5	2,349.1
Total Acres	16,302.9	4,252.4	13,545.7

4 The corresponding segment of the proposed route currently crosses two Areas of Concern (AOC) (see the response to data request #1). If the Warm Springs Alternative was incorporated into the proposed route, all AOCs would be avoided.

TABLE 2.2.2-1

Palomar Gas Transmission Project
Acres of Northern Spotted Owl Habitat Within the Action Area of the Warm Springs Alternative Segment[a]

Physiographic Province/County	Available Suitable Habitat Within 1 Mile of the Construction Corridor (Acres)		
	Suitable Habitat	Dispersal Only	Non-Suitable Habitat

[a] Habitat suitability determined from Biomapper analysis provided by the FWS.
[b] Warm Springs Alternative mileposts.

TABLE 2.2.2-2

Palomar Gas Transmission Project
2009 Northern Spotted Owl Occurrences and Status along the Warm Springs Alternative

Nearest Milepost[a]	Resident Status	Closest Documented Distance from Centerline (feet)	Survey Area (Stations where Detections were noted)	Legal Description of Detections
49	Pair (nesting status unknown)	5,300	Warm Springs River (WSR13)	NW ¼ of Section 11, T7S, R8.5E SW ¼ of Section 11, T7S, R8.5E
53	Pair(nesting status unknown)	275	Warm Springs River (WSR19, WSR23, TL34)	NE ¼ of Section 23, T6S, R8.5E NW ¼ of Section 23, T6S, R8.5E SE ¼ of Section 23, T6S, R8.5E SW ¼ of Section 14, T6S, R8.5E NE ¼ of Section 24, T6S, R8E SE ¼ of Section 24, T6S, R8E
53	Unknown[b]	3,900	Timothy Lake (TL36)	NE ¼ of Section 13, T6S, R8E SE ¼ of Section 13, T6S, R8E
58	Nesting Pair	4,200	Peavine Creek (PC01, PC04, PC08, PC22, PC28)	NW ¼ of Section 18, T6S, R8E SE ¼ of Section 18, T6S, R8E SW ¼ of Section 18, T6S, R8E NE ¼ of Section 7, T6S, R8E SE ¼ of Section 7, T6S, R8E NE ¼ of Section 13, T6S, R7E SE ¼ of Section 12, T6S, R7E
60	Pair (nesting status unknown)	675	Peavine Creek (PC17)	NW ¼ of Section 24, T6S, R7E SE ¼ of Section 14, T6S, R7E NE ¼ of Section 23, T6S, R7E
60	Unknown	6,375	Kink Creek (KC01)	NW ¼ of Section 11, T6S, R7E

[a] Warm Springs Alternative mileposts.
[b] Possibly male from WSR19.

TABLE 2.3.1-1

Palomar Gas Transmission Project
Habitat Removal within the Range of the Northern Spotted Owl Along the Warm Springs Alternative [a]

	Suitable (Nesting, Roosting, and Foraging)					Dispersal Habitat					Capable (Replacement) Habitat				
	USFS				Warm	USFS				Warm	USFS				Warm
Facility/County	LSR [b,c]	LSR/ RR [b,c]	Matrix [c]	Matrix/ RR [b,c]	Springs Reservation	LSR [b,c]	LSR/ RR [b,c]	Matrix [c]	Matrix/ RR [b,c]	Springs Reservation	LSR [b,c]	LSR/ RR [b,c]	Matrix [c]	Matrix/ RR [b,c]	Springs Reservation
Cascade Section															
East Cascades (MPs 24.8-44.9)[d,e]															
Wasco	0.0	0.0	0.0	0.0	17.9	0.0	0.0	0.0	0.0	42.4	0.0	0.0	0.0	0.0	131.9
West Cascades (MPs 44.9-60.3)[e]															
Wasco	0.0	0.0	35.7	0.0	2.9	0.0	0.0	9.3	0.0	0.0	0.0	0.0	23.0	0.0	0.0
Clackamas	0.0	0.0	16.9	0.0	0.0	0.0	0.0	44.2	0.0	0.0	16.2	0.0	54.1	0.0	0.0
Total	0.0	0.0	52.6	0.0	20.7	0.0	0.0	53.5	0.0	42.4	16.2	0.0	77.2	0.0	131.9

[a] All areas are measured in acres to the nearest 0.1. Totals may appear incorrect due to rounding.

[b] Late Successional Reserve (LSR), Riparian Reserve (RR)

[c] Results are mutually exclusive except in columns containing two Land Use Allocations where they contain an overlap between the Land Use Allocations.

[d] NSO habitat suitability begins approximately at MP 37.5. Areas east of this point were not included in this analysis.

[e] Warm Springs Alternative mileposts.

TABLE 2.3.1-2

Palomar Gas Transmission Project
Habitat Removal and Effects Determination for Northern Spotted Owl Home Ranges Along the Warm Springs Alternative

Owl Pair	MHNF ID	Milepost (Physiographic Province)	Status	Parameter Evaluated	Suitable (NRF) Habitat (acres)	Dispersal Habitat (acres)	Capable (Replacement) Habitat (acres)	Percent of Owl Circle in Suitable Habitat	Suitable (NRF) Habitat Removed (acres)	Dispersal Habitat Removed (acres)	Capable (Replacement) Habitat Removed (acres)	Total Habitat Removed (acres)	Percent in Suitable (NRF) Habitat, Post-construction	Percent Change in Suitable (NRF) Habitat
H-1	378	50.8 (West Cascades)	Historic	Nest Patch [a]	28.1	0.0	41.7	40%	2.6	0.0	3.6	6.1	37%	-4%
				Core Area[b]	161.1	0.0	341.4	32%	2.8	0.0	9.4	12.2	31%	-1%
				Home Range[c]	1220.2	183.8	1490.0	42%	9.8	5.0	10.1	24.9	42%	0%
H-2	129	53.2 (West Cascades)	Historic	Nest Patch	49.1	0.0	20.7	70%	0.0	0.0	0.0	0.0	70%	0%
				Core Area	265.6	62.1	174.8	53%	6.3	0.0	1.8	8.0	52%	-1%
				Home Range	1139.6	551.5	1202.9	39%	14.2	5.3	13.0	32.6	39%	-1%
H-3	128	54.8 (West Cascades)	Historic	Nest Patch	31.3	23.7	14.8	45%	0.0	0.0	0.0	0.0	45%	0%
				Core Area	227.4	104.3	170.7	45%	3.3	6.1	2.8	12.2	45%	-1%
				Home Range	1377.6	585.1	931.3	48%	12.3	6.8	13.1	32.2	47%	-1%
H-4	193	57.7 (West Cascades)	Historic	Nest Patch	42.1	10.4	17.3	60%	0.0	0.0	0.0	0.0	60%	0%
				Core Area	241.4	104.9	156.1	48%	0.0	0.0	0.0	0.0	48%	0%
				Home Range	808.3	1029.7	1056.0	28%	0.8	26.2	15.5	42.5	28%	0%
H-5	142	57.9 (West Cascades)	Historic	Nest Patch	37.6	22.0	10.2	54%	0.0	0.0	0.0	0.0	54%	0%
				Core Area	153.2	133.0	216.3	30%	0.0	0.0	0.0	0.0	30%	0%
				Home Range	842.8	806.6	1244.6	29%	0.0	20.7	12.5	33.2	29%	0%
H-6	173	58.7 (West Cascades)	Historic	Nest Patch	39.1	0.0	30.7	56%	0.0	0.0	0.0	0.0	56%	0%
				Core Area	120.5	71.4	310.6	24%	0.0	1.8	14.0	15.8	24%	0%
				Home Range	904.0	630.2	1359.8	31%	0.0	14.6	17.1	31.7	31%	0%
S-1	WSR-13	50.2 (West Cascades)	Pair (Status Unknown)	Nest Patch	40.8	0.0	29.0	58%	0.0	0.0	0.0	0.0	58%	0%
				Core Area	312.9	0.0	189.6	62%	0.0	0.0	0.0	0.0	62%	0%
				Home Range	1445.3	206.1	1242.6	50%	0.0	0.0	6.0	6.0	50%	0%

TABLE 2.3.1-2

Palomar Gas Transmission Project
Habitat Removal and Effects Determination for Northern Spotted Owl Home Ranges Along the Warm Springs Alternative

Owl Pair	MHNF ID	Milepost (Physiographic Province)	Status	Parameter Evaluated	Suitable (NRF) Habitat (acres)	Dispersal Habitat (acres)	Capable (Replacement) Habitat (acres)	Percent of Owl Circle in Suitable Habitat	Suitable (NRF) Habitat Removed (acres)	Dispersal Habitat Removed (acres)	Capable (Replacement) Habitat Removed (acres)	Total Habitat Removed (acres)	Percent in Suitable (NRF) Habitat, Post-construction	Percent Change in Suitable (NRF) Habitat
S-2	WSR-19	53.8 (West Cascades)	Pair (Status Unknown)	Nest Patch	25.1	29.4	15.3	36%	0.0	0.0	0.0	0.0	36%	0%
				Core Area	181.9	200.6	120.0	36%	0.0	0.0	0.0	0.0	36%	0%
				Home Range	1264.3	539.0	1090.7	44%	23.8	5.6	9.6	39.0	43%	-1%
S-3	TL-36	54.6 (West Cascades)	Pair (Status Unknown)	Nest Patch	25.3	3.1	41.3	36%	0.0	0.0	0.0	0.0	36%	0%
				Core Area	219.5	51.6	231.5	44%	0.0	0.0	0.0	0.0	44%	0%
				Home Range	1364.0	431.6	1098.4	47%	13.4	6.1	2.9	22.5	47%	0%
S-4	PC-17	60.4 (West Cascades)	Pair (Status Unknown)	Nest Patch	20.7	0.0	49.1	30%	0.0	0.0	0.0	0.0	30%	0%
				Core Area	153.6	11.1	337.9	31%	0.0	0.0	0.0	0.0	31%	0%
				Home Range	916.4	84.1	1893.6	32%	0.0	0.0	8.8	8.8	32%	0%
S-5	PC-28	59.7 (West Cascades)	Pair (Status Unknown)	Nest Patch	23.7	0.0	46.1	34%	0.0	0.0	0.0	0.0	34%	0%
				Core Area	186.9	11.1	304.5	37%	0.0	0.0	0.0	0.0	37%	0%
				Home Range	1160.1	148.1	1585.8	40%	0.0	0.0	18.7	18.7	40%	0%
WS-1	S798-05	47.5 (West Cascades)	Resident Single	Nest Patch	NA	NA	NA	NA	0.0	0.0	0.0	0.0	NA	NA
				Core Area	NA	NA	NA	NA	0.0	0.0	0.0	0.0	NA	NA
				Home Range	543.2	628.1	1722.8	19%	11.8	4.4	0.0	16.2	18%	0%

Likely to Adversely Affect Individual Northern Spotted Owls

Percent suitable habitat is below FWS take threshold for Northern Spotted Owl Circles

TABLE 2.3.1-2

Palomar Gas Transmission Project
Habitat Removal and Effects Determination for Northern Spotted Owl Home Ranges Along the Warm Springs Alternative

Owl Pair	MHNF ID	Milepost (Physiographic Province)	Status	Parameter Evaluated	Suitable (NRF) Habitat (acres)	Dispersal Habitat (acres)	Capable (Replacement) Habitat (acres)	Percent of Owl Circle in Suitable Habitat	Suitable (NRF) Habitat Removed (acres)	Dispersal Habitat Removed (acres)	Capable (Replacement) Habitat Removed (acres)	Total Habitat Removed (acres)	Percent in Suitable (NRF) Habitat, Post-construction	Percent Change in Suitable (NRF) Habitat

[a] The nest patch is the 300-meter-radius circle (69.8 acres) around a known or predicted spotted owl site, where a spotted owl would be likely to select a nesting tree. The take threshold is any removal of suitable habitat.

[b] The core area is a 0.5-mile-radius circle (502.5 acres) around a known or predicted owl site that delineates the area most heavily used by spotted owls during the nesting season. The take threshold is removal of suitable habitat that results in less then 50 percent suitable habitat (250 acres) in the core post-treatment.

[c] The home range area is an estimated area of habitat use by a spotted owl pair. For the Oregon Cascades, this estimate is a 1.2-mile-radius circle (2,894 acres) around a known owl site. For the Oregon Coast Range, this estimate is a 1.5-mile-radius circle (4,521 acres) around a known owl site. The take threshold is removal of suitable habitat that results in less then 40 percent suitable habitat in the home range post-treatment.

TABLE 2.3.1-4

Palomar Gas Transmission Project
Potential Blast Areas Within the Range of the Northern Spotted Owl Along the Warm Springs Alternative

Facility/County	Begin Milepost[a]	End Milepost	Probability that Blasting will be Required (Likely/Possible)
MAINLINE			
Warm Springs Alternative			
Wasco County	34.4	37.1	Possible
	38.5	40.1	Possible
	41.6	41.6	Possible
	43.3	43.3	Possible
	47.0	52.6	Possible
Clackamas County	58.9	58.9	Possible

[a] Potential blast areas were estimated based on the Golder (2010) report. This report was designed to obtain information on potential blasting sites within waterbody crossings on the Warm Springs Alternative. The potential blast areas above are based on this information and an extrapolation of the areas where blasting may be required.

Reference

Golder Associates, Inc. 2010. Technical Memorandum. Re: Response to FERC Information Requests – Anticipated Excavation Methods at Proposed Stream Crossings on the Warm Springs and Maupin Waterline Alternative Routes.

Response by: John Cassady, Palomar Gas Transmission, LLC, (503) 833-4703

9. Identify potential impacts to federally listed fish species and critical habitat resulting from implementation of the Maupin Waterline and the Warm Springs Alternatives. Also provide all information for these alternatives that was provided for the proposed route. Some examples, but not a complete list, are noted below.

a. Summary tables comparable to Table B-1 filed in the response to the Commission's February 27, 2009, data request.

b. Information on potential blasting near streams using the format in Table 14-1 filed in the response to the Commission's August 26, 2009, data request.

c. A description of construction-related impacts from new access road miles by sub-basin similar to Tables 22-2 and 22-3 filed in the response to the Commission's August 26, 2009, data request.

d. Information on riparian areas in the same manner as provided for the proposed route in Table 25-1 filed in the response to the Commission's August 26, 2009, data request.

e. Additional mitigation, such as habitat restorations (location and distance from the crossing), large woody debris (LWD) placement (number and locations), and road improvement or decommissioning. Also describe how these restoration actions mitigate for adverse effects to aquatic habitat function.

f. Information on environmental baseline conditions of any additional fifth field watersheds crossed, similar to the information filed in response to question number 13 of the Commission's August 26, 2009, data request.

RESPONSE:

No new federally listed fish species would be affected by either the Maupin or Warm Springs Alternative. However, there would be some differences to the overall assessment of the already identified fish species affected by the proposed route if either of these two alternatives is incorporated into the proposed route. A specific discussion for each alternative is provided below. In addition, several revisions would be required to the project description included in Section 2, Volume I of the Applicant-prepared Draft Biological Assessment (ADBA) provided in June 2009. Those revisions are identified in the response to data request #8.

Maupin Waterline Alternative

The Maupin Waterline Alternative crosses waterbodies that contain the federally listed bull trout and Middle Columbia River (MCR) steelhead as well as critical habitat for both species. The corresponding segment of the proposed route also crosses waterbodies containing these species but the proposed route does not affect any designated critical habitat for bull trout.

The overall analysis and determination of effect for the bull trout would be the same for the Maupin Waterline Alternative as the corresponding segment of the proposed route (*not likely to adversely affect*). However, Section 4.0 of Volume II of the ADBA would need to be revised to reflect a different crossing location for the Deschutes River as well as the additional crossing of a side channel and designated critical habitat. The information needed to revise Section 4.0 of Volume II of the ADBA is provided below.

The analysis for MCR steelhead currently presented in Section 2.0 of Volume III of the ADBA would need to be revised to reflect the fact that the Maupin Waterline Alternative would only cross one waterbody and associated side channel with this species and designated critical habitat present (Deschutes River), compared with three waterbody crossings along the proposed route (Thorn Hollow Creek, Wood Gulch, and the Deschutes River). The determination of effect for MCR steelhead would change from *likely to adversely affect* to *not likely to adversely affect* if the Maupin Waterline Alternative were selected as the preferred route. The determination for critical habitat (*not likely to adversely affect*) would not change. The information needed to revise Section 2.0 of Volume III of the ADBA is provided below.

In addition to the supplemental information provided for bull trout and MCR steelhead, the specific information requested in items a. through f. are also provided below.

Bull Trout *[revised from June 2009 ADBA, Section 4.0, Volume II]*

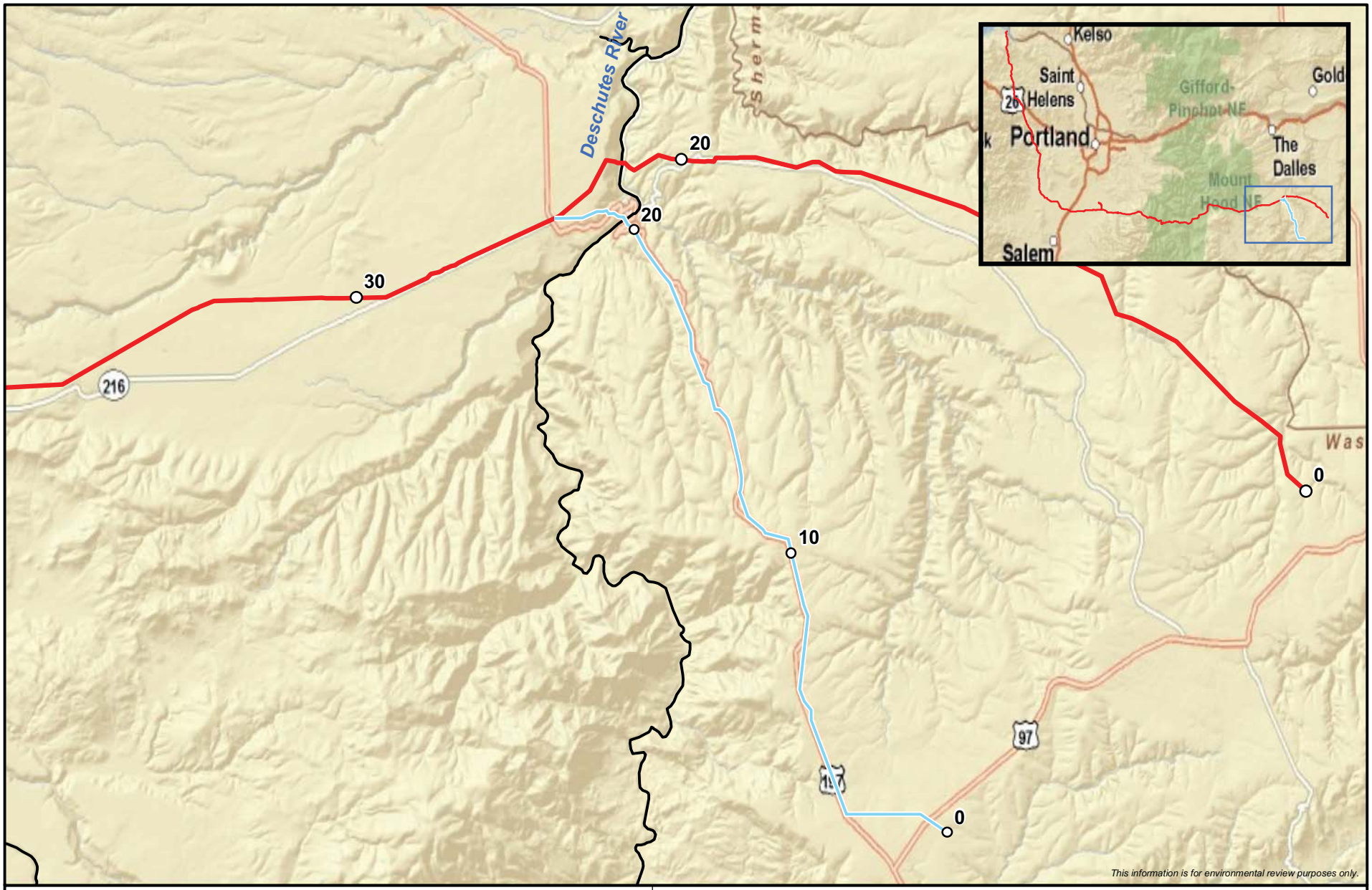
The Maupin Waterline Alternative crosses three fifth field Hydrologic Unit Code (HUC) Watersheds: Antelope Creek, Bakeoven Creek, and Middle Deschutes River. Of these three HUCs, only the Middle Deschutes River HUC has bull trout presence within the action area of the alternative; specifically, bull trout are present in the Deschutes River and an associated side channel (table 9-1 and figure 9-1).

TABLE 9-1

Palomar Gas Transmission Project
Maupin Waterline Alternative
Waterbody Crossings with Bull Trout Present

Waterbody Crossing Name/Unique ID	MP	Crossing Type	Stream Type	Lifestage Present			Habitat Feature		
				Migration	Spawning	Rearing	Riparian forest	Habitat Structure (LWD, boulders)	Substrate
Deschutes River WS-SW57	20.3	Aerial	P	X			Y	Boulders	Gravel, cobbles, boulders
Deschutes River Side Channel WS-SW9M	20.4	Aerial	P	X			Y	Boulders	Gravel, cobbles, boulders

Source: StreamNet, 2009.



Milepost
Mainline Route
Maupin Waterline Alternative
Bull Trout Presence

0 2.5 5 Miles

N

palomar

Figure 9-1
Palomar Gas Transmission Project
Maupin Waterline Alternative
Bull Trout Presence

NATURAL RESOURCE GROUP

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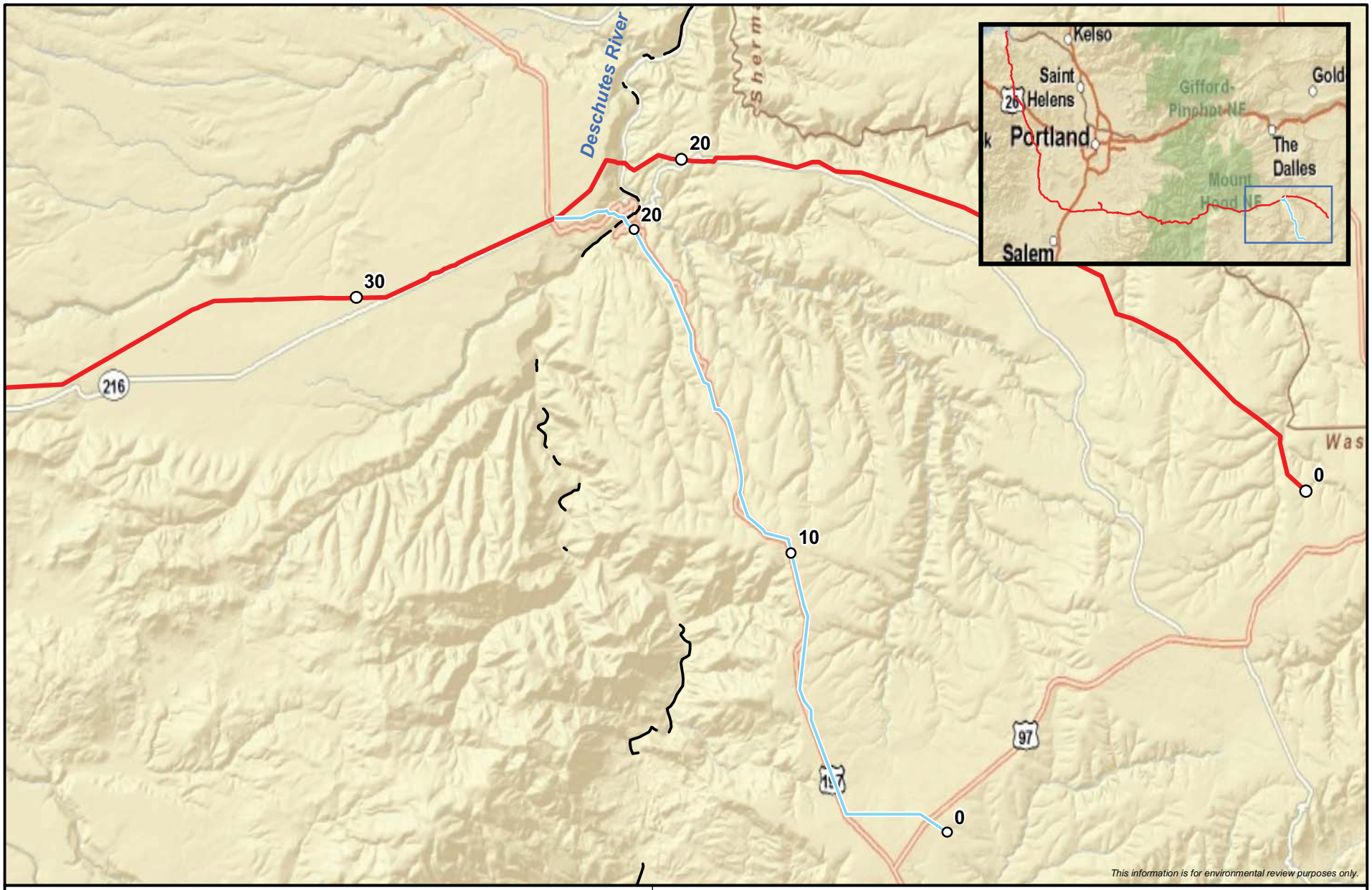
The Maupin Waterline Alternative would cross the Deschutes River and the associated side channel with a single aerial span. This aerial span would be located adjacent to an existing waterline at River Mile (RM) 51.8, approximately 1,535 feet (0.3 mile) upstream of the existing Maupin bridge (US 197). About 0.4 acre of riparian vegetation would be affected by this crossing. Although blasting may be needed to install the bridge pilings, no underwater blasting or other in-stream work is anticipated to occur in order to construct the aerial span. Therefore, the blasting is not likely to adversely affect the fish. No new roads or improvements are planned near the crossing. Since the proposed project's crossing method of the Deschutes River is also an aerial span, the impacts for the Maupin Alternative would be similar to the impacts described for the proposed route in the June 2009 ADBA.

The overall determination of not likely to adversely affect for bull trout will be the same as for the proposed route presented in the June 2009 ADBA. Since there are not anticipated to be any adverse effects to bull trout, no mitigation is proposed beyond the conservation measures described in the ADBA for bull trout.

Critical Habitat

The Deschutes River and side channel at the crossing location associated with the Maupin Waterline Alternative are designated critical habitat for bull trout (see figure 9-2). Migrating bull trout is the only life stage that occurs in the project area (see table 9-1). Spawning and rearing life stages can occur 0.5 mile upstream of the Deschutes River and side channel crossing locations, which is considered outside of the alternative's action area.



Milepost
Mainline Route
Maupin Waterline Alternative
Bull Trout Critical Habitat

0 2.5 5 Miles

N

palomar

Figure 9-2
Palomar Gas Transmission Project
Maupin Waterline Alternative
Bull Trout Critical Habitat

NATURAL RESOURCE GROUP

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As described in the ADBA, the U.S. Fish and Wildlife Service (FWS) identified the following Primary Constituent Elements (PCEs) for bull trout that are considered essential for bull trout conservation (FWS, 2002):

- permanent water with low levels of contaminants;
- water temperatures ranging from 36 °F to 59 °F with adequate thermal refugia for temperatures at the upper end of the range;
- complex stream channels with habitat features such as woody debris, side channels, pools, and undercut banks;
- substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwintering survival, fry emergence, and young-of-the-year and juvenile survival;
- a natural hydrograph, including peak, high, low, and base flows within historic ranges or, in regulated watersheds, a hydrograph that is able to support bull trout populations;
- springs, seeps, groundwater sources, and subsurface water connectivity to contribute to water quality and quantity;
- migratory corridors with minimal physical, biological, or chemical barriers between spawning, rearing, overwintering, and foraging habitats;
- an abundant food base including aquatic macroinvertebrates and forage fish; and
- few or no predatory, interbreeding, or competitive non-native species present.

Since both the Deschutes River and side channel would be crossed by an aerial span with no in-stream construction, no adverse impacts on any of the above PCEs are anticipated to occur. Although 0.4 acre of riparian habitat may be removed to construct the aerial span, the associated impacts would be minimal. The riparian areas are not vegetated with large trees; subsequently, there would be no decrease in LWD recruitment or changes in water temperature due to construction. In addition, PGT would restore the vegetation within the construction area. Therefore, the Maupin Waterline Alternative is *not likely to adversely affect* bull trout critical habitat. Since there would be no anticipated adverse effects to bull trout critical habitat, no additional mitigation would be proposed beyond the conservation measures for bull trout described in the ADBA.

Reference:

U.S. Fish and Wildlife Service (FWS). 2002. Endangered and Threatened Wildlife and Plants: Proposed Designation of Critical Habitat for the Klamath River and Columbia River Distinct Population Segments of Bull Trout. Federal Register, Volume 67, Number 230.

Middle Columbia River Steelhead *[revised from June 2009 ADBA, Section 2.0, Volume III]*

The Maupin Waterline Alternative crosses the MCR steelhead Distinct Population Segment (DPS). This alternative crosses three fifth field HUC Watersheds: Antelope Creek, Bakeoven Creek, and Middle Deschutes River. Of these three HUCs, only the Middle Deschutes River HUC has MCR steelhead presence within the action area of this alternative; specifically, MCR steelhead are present in the Deschutes River and an associated side channel (table 9-2 and figure 9-3). The corresponding segment on the proposed route crosses three waterbodies with MCR steelhead presence: Thorn Hollow Creek; Wood Gulch; and the Deschutes River.

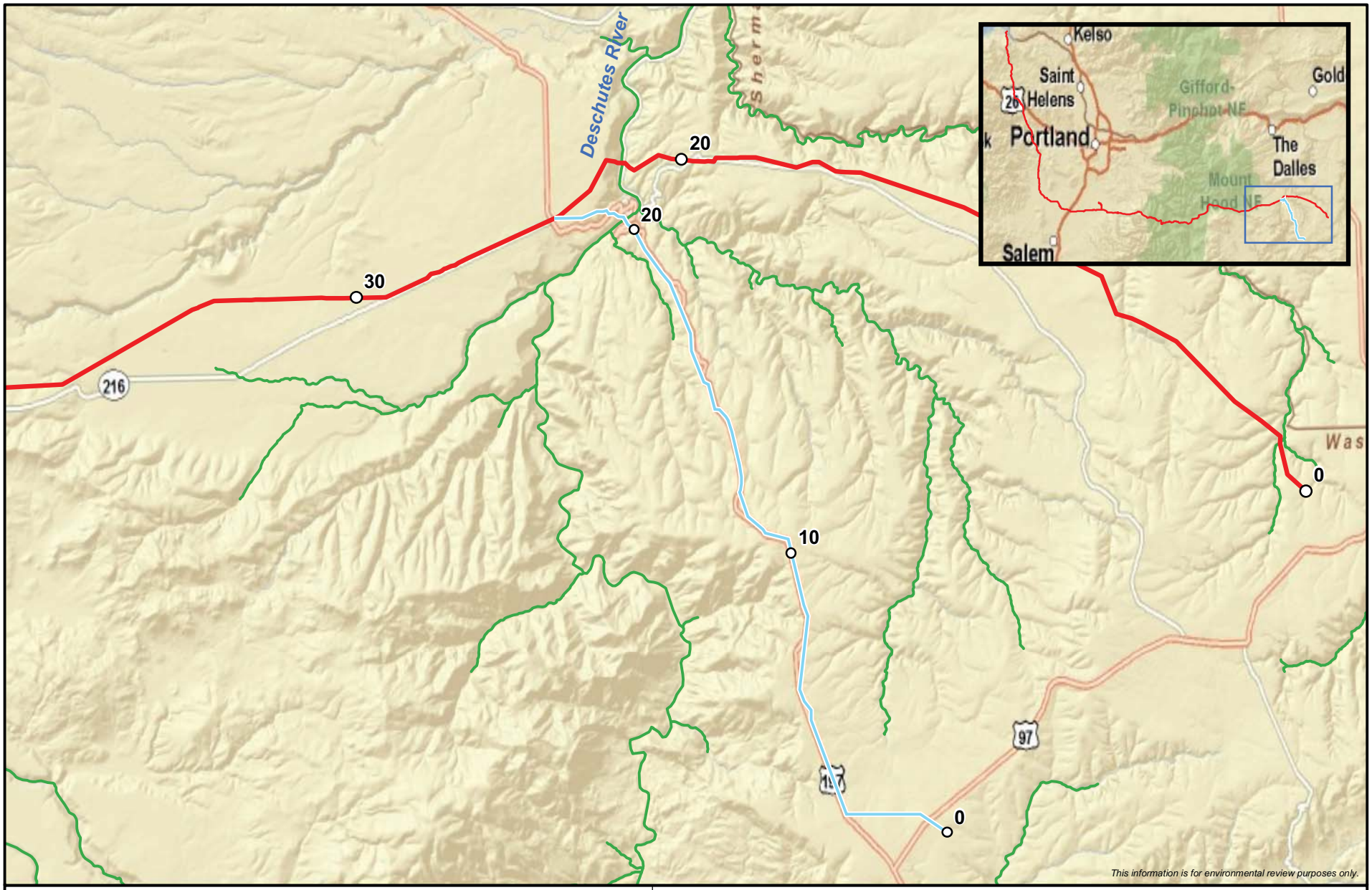
TABLE 9-2

Palomar Gas Transmission Project
Maupin Waterline Alternative
Waterbody Crossings with Middle Columbia River Steelhead Present

					Lifestage Present			Habitat Features[a]		
Waterbody Crossing Name/Unique ID	Run	MP	Crossing Type	Stream Type	Mig-ration	Spawn-ing	Rear-ing	Riparian forest	Habitat Structure (LWD, boulders)	Substrate
Deschutes River WS-SW57	summer	20.3	Aerial	P	X	X	X	Y	Boulders	Gravel, cobbles, boulders
Deschutes River Side Channel WS-SW9M	summer	20.4	Aerial	P	X	X	X	Y	Boulders	Gravel, cobbles, boulders

Source: StreamNet, 2009.
[a] Habitat feature descriptions are provided where survey data are available.

The Maupin Waterline Alternative would cross the Deschutes River and the associated side channel with a single aerial span. This aerial span would be located adjacent to an existing waterline at RM 51.8, approximately 1,535 feet (0.3 mile) upstream of the existing Maupin bridge (US 197). About 0.4 acre of riparian vegetation would be affected by this crossing. Although blasting may be needed to install the bridge pilings, no underwater blasting or other in-stream work is anticipated to occur in order to construct the aerial span. Therefore, the blasting is not likely to adversely affect the fish. No new roads or improvements are planned near the crossing. Since the proposed project's crossing method of the Deschutes River is also an aerial span, the impacts for the Maupin Alternative would be similar to the impacts described for the proposed route in the June 2009 ADBA.



Milepost
Mainline Route
Maupin Waterline Alternative
Middle Columbia DPS Summer Presence

N

0 2.5 5 Miles

Figure 9-3
Palomar Gas Transmission Project
Maupin Waterline Alternative
Middle Columbia River Steelhead DPS Presence

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For the Maupin Waterline Alternative, the overall impacts for MCR steelhead are similar to those for bull trout on the proposed route, because in both cases the only crossing method would be an aerial span. Thus, the overall determination for MCR steelhead on the Maupin Alternative is not *likely to adversely affect*. Since no adverse effects are anticipated for MCR steelhead, no additional mitigation is proposed beyond the conservation measures described in the ADBA for the bull trout at the Deschutes River crossing.

Critical Habitat

The Deschutes River and side channel at the crossing location associated with the Maupin Waterline Alternative are designated critical habitat for MCR steelhead (see figure 9-4). Migration, spawning, and rearing occur within the project area (see table 9-2). Since the river and side channel will be crossed via an aerial span with no in-stream construction, impacts associated with water quality or connectivity are not anticipated to occur. Although 0.4 acre of riparian habitat may be removed to construct the aerial span, the associated impacts would be minimal. The riparian areas are not vegetated with large trees; subsequently, there would be no decrease in LWD recruitment or changes in water temperature due to construction. In addition, PGT would restore the vegetation within the construction area. Therefore, the Maupin Waterline Alternative is *not likely to adversely affect* MCR steelhead critical habitat. Since no adverse effects are anticipated for MCR steelhead critical habitat, no mitigation is proposed beyond the conservation measures described in the ADBA for bull trout at the Deschutes River crossing.

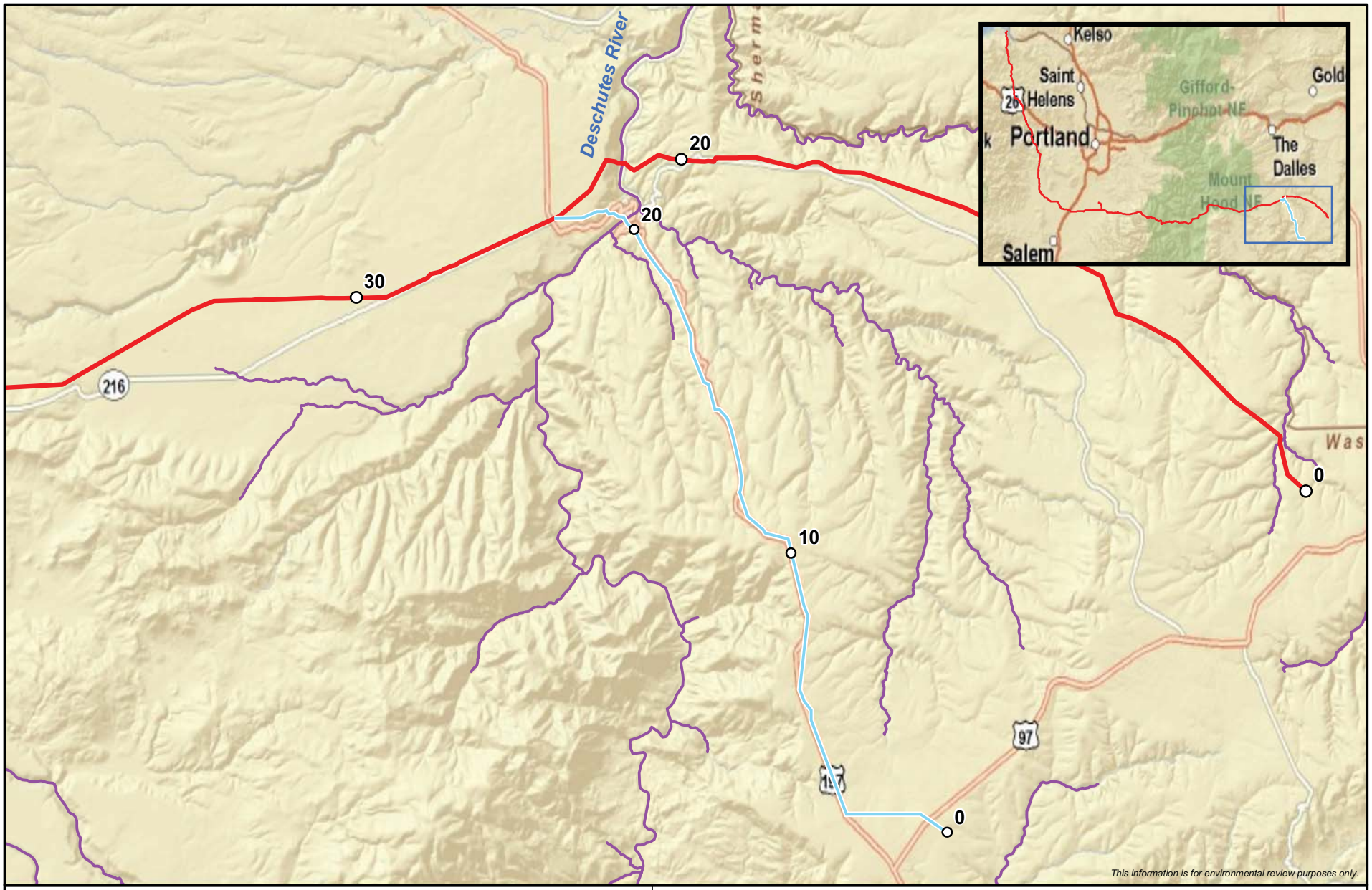

Figure 9-4
Palomar Gas Transmission Project
Maupin Waterline Alternative
Middle Columbia River Steelhead DPS Critical Habitat

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Items a. through f.

a. The requested waterbody crossing table for the Maupin Waterline Alternative is provided as Attachment 9A-1. A revised version of the table from Appendix R of the ADBA is also provided. In addition, Attachment 9A-1 includes photos of the waterbodies collected during field surveys.

b. Information on potential blasting near streams along the Maupin Waterline Alternative is provided as Attachment 9B-1.

c. Information on construction-related impacts from access roads associated with the Maupin Waterline Alternative is provided as Attachment 9C-1. No waterbodies are crossed by the access roads associated with the Maupin Waterline Alternative, and therefore no riparian acres are impacted.

d. Information on riparian areas associated with the Maupin Waterline Alternative is provided as Attachment 9D-1.

e. The Maupin Waterline Alternative is *not likely to adversely affect* bull trout or MCR steelhead or their designated critical habitat. Therefore, no additional mitigation is proposed beyond the conservation measures described in the ADBA.

f. No additional information on environmental baseline conditions of fifth field watersheds is needed for the Maupin Waterline Alternative. The Maupin Waterline Alternative crosses one fifth field watershed with bull trout and MCR steelhead present – the Middle Deschutes. Bull trout and MCR steelhead were also present in the Middle Deschutes Watershed on the proposed route; thus, a description of the environmental baseline conditions for the Middle Deschutes watershed is provided in the June ADBA. In addition, supporting data and determinations of environmental baseline function using NMFS Pathways and Indicators are provided in the response to data request #10.

Warm Springs Alternative

Similar to the proposed route, the Warm Springs Alternative crosses waterbodies that contain the federally listed bull trout and MCR steelhead as well as critical habitat for MCR steelhead. The alternative does not cross any designated critical habitat for bull trout. When compared to the proposed route, the alternative would cross an additional waterbody with bull trout present (Shitike Creek) and different waterbodies with MCR steelhead present.

The overall analysis and determination of effect for the bull trout would change from a *not likely to adversely affect* for the proposed route to a *likely to adversely affect* for the Warm Springs Alternative. The determination for bull trout critical habitat would change from a *not likely to adversely affect* on the proposed route to a *no effect* on the Warm Springs Alternative. If the Warm Springs Alternative was selected as the proposed route, Section 4.0 of Volume II of the ADBA would need to be replaced. The information needed to replace Section 4.0 of Volume II of the ADBA is provided below.

The analysis for MCR steelhead currently presented in Section 2.0 of Volume III of the June 2009 ADBA would need to be revised to reflect the fact that the Warm Springs Alternative crosses Shitike Creek, Mill Creek, South Fork Warm Springs River, and Warm Springs River compared to the proposed route, which crosses Thorn Hollow Creek, Wood Gulch, and the Deschutes River. The determination of effect for MCR steelhead would remain the same if the Warm Springs Alternative were selected as the preferred route (*likely to adversely affect*). The determination for critical habitat would change from *not likely to adversely affect* to *likely to adversely affect*. The information needed to revise Section 2.0 of Volume III of the ADBA is provided below.

The Warm Springs Alternative also crosses the Lower Columbia River (LCR) coho Evolutionarily Significant Unit (ESU). Although the Warm Springs Alternative crosses 6.2 miles of the LCR coho ESU (see figure 9-5), the pipeline footprint does not cross any waterbodies with coho presence or within 0.25 mile of presence. However, there is one access road associated with the Warm Springs Alternative (Nfd 4660) requiring improvements that is 0.1 mile upstream of LCR coho presence on Pot Creek in Mount Hood National Forest. Access road improvements and associated impacts are the same as those discussed in the ADBA submitted in June 2009. For the project as a whole, the overall determination of *likely to adversely affect* for this ESU will be the same as presented in the June 2009 ADBA. Currently critical habitat is not designated for LCR coho.

In addition to the supplemental information provided for bull trout and MCR steelhead, the specific information requested in items a. through f. are also provided below.

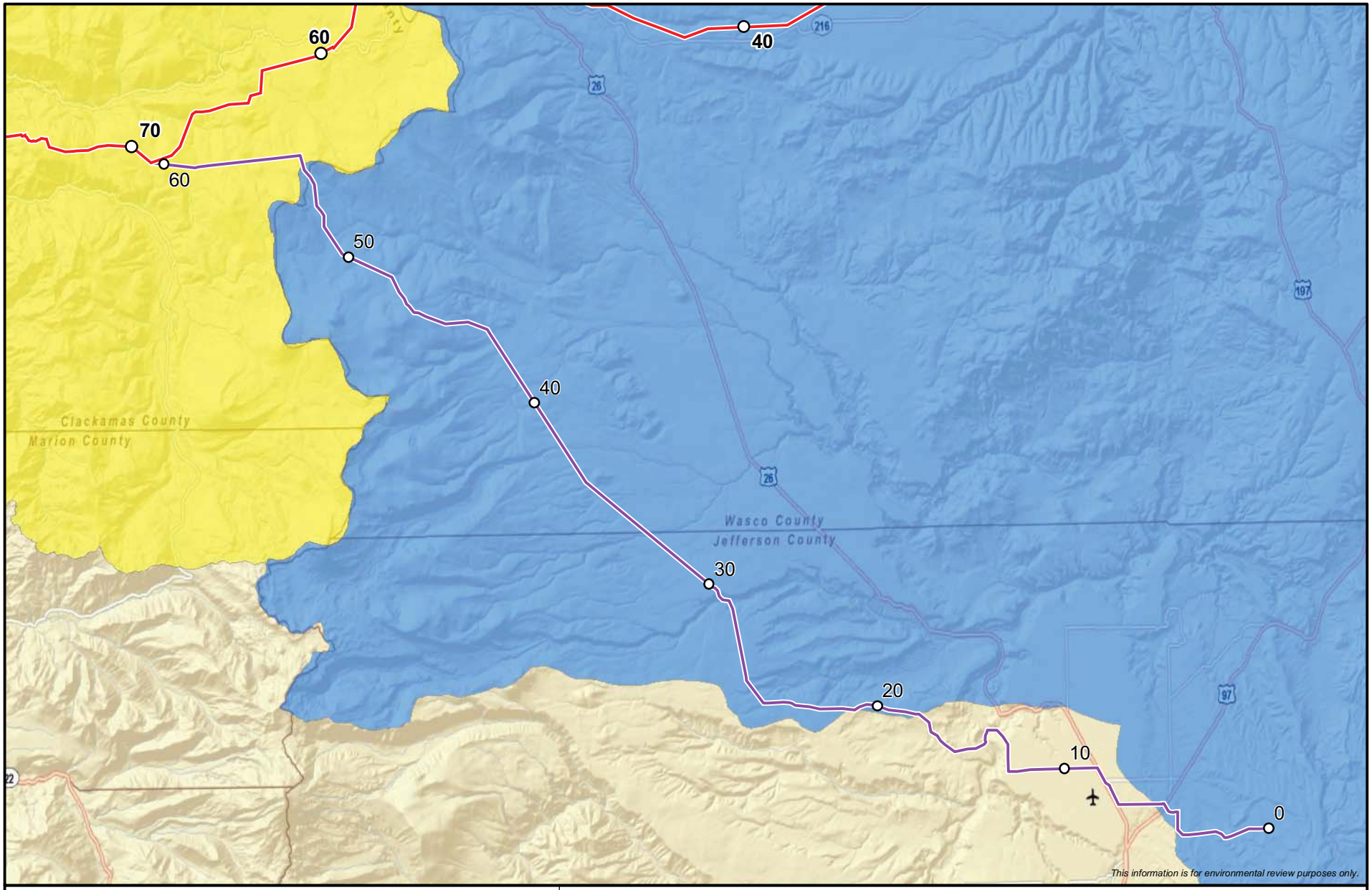

Figure 9-5
Palomar Gas Transmission Project
Pacific Salmon ESU/DPS Locations in Warm Springs Alternative

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Bull Trout *[revised from June 2009 ADBA, Section 4.0, Volume II]*

If the Warm Springs Alternative were selected as the preferred route, the analysis and determination of effect for bull trout would change. Therefore, PGT is providing an entirely revised bull trout section that would replace the current Section 4 in Volume II of the ADBA. The revised Section 4 is provided as Attachment 9-1.

Middle Columbia River Steelhead *[revised from June 2009 ADBA, Section 2.0, Volume III]*

If the Warm Springs Alternative were selected as the preferred route, significant portions of the analysis for the MCR steelhead would change. Therefore, PGT is providing an entirely revised MCR steelhead section that would replace the current Section 2 in Volume III of the ADBA. The revised Section 4 is provided as Attachment 9-2.

Items a. through f.

a. The requested waterbody crossing table for the Warm Springs Alternative is provided as Attachment 9A-2. A revised version of the table from Appendix R of the ADBA is also provided. In addition, Attachment 9A-2 includes photos of the waterbodies collected during field surveys.

b. Information on potential blasting near streams along the Warm Springs Alternative is provided as Attachment 9B-2.

c. Information on construction-related impacts from access roads associated with the Warm Springs Alternative is provided as Attachment 9C-2.

d. Information on riparian areas associated with the Warm Springs Alternative is provided as Attachment 9D-2.

e. The Warm Springs Alternative is *likely to adversely affect* LCR coho, bull trout, and MCR steelhead as well as MCR steelhead critical habitat. Collectively, impacts on these listed fish are anticipated within five waterbodies – the species that may be impacted in each watershed are in parentheses: Deschutes River (bull trout), Shitike Creek (bull trout, MCR steelhead), Mill Creek (MCR steelhead), South Fork Warm Springs River (MCR steelhead), and Warm Springs River (MCR steelhead). All of these waterbody crossings occur within Confederated Tribes of Warm Springs (CTWS) land except for the Warm Springs River crossing, which occurs on Mount Hood National Forest (MHNF). The impacts associated with the Warm Springs River crossing will be covered by implementing compensatory mitigation measures proposed by the U.S. Forest Service as part of the amendments to the forest management plan for MHNF. Specific amounts and locations for each of these types of mitigation measures are still being determined.

The CTWS has identified 11 projects that would offset any impacts on listed fish associated with waterbodies crossed on Reservation lands. These projects include culvert replacement or removal to increase connectivity, road removal, riparian restoration to reduce sediment delivery to the associated waterbody, and placement of large woody debris (LWD) or boulders to increase habitat complexity that is beneficial for spawning and rearing life phases. PGT has committed to work with the CTWS to implement these projects if the Warm Springs Alternative is built. A summary of the 11 projects, as provided by the CTWS, is provided below.

Project 1

Removal of the culvert on the lower portion of Road W-245. In addition, the unnumbered road immediately west of W-245 will be rerouted, reconstructed, and surfaced. This project will benefit fish habitat by providing cold water refugia and reduce sediment delivery to Twinflower Creek and the North Fork Warm Springs River.

The project is located in the northwest portion of the Warm Springs Reservation approximately 2 miles from milepost 48 of the alternative. It is within the Warm Springs River fifth field watershed and will benefit MCR steelhead and associated critical habitat in the Warm Springs River.

Project 2

Resurface the new W-249 road segment near Twinflower Creek. This project will benefit listed fish by reducing sediment delivery to Twinflower Creek.

The project is located within the Warm Springs River fifth field watershed and will benefit MCR steelhead and associated critical habitat in the Warm Springs River.

Project 3

Remove 2 miles of the spur road on the northeast side of the North Fork Warm Springs River near Schoolie Camp to offset the increased road network and heavy traffic that is associated with construction. This spur intersects with the B-200 Road and crosses through a meadow/wetland complex. Removing this road will enhance wildlife values and reconnect a spring and wetland area to the main Warm Springs River. In addition, a portion of this spur road is used by CTWS Fish Resource personnel to access a weir site on the Warm Springs River upstream of Schoolie Camp. This road will be improved (by constructing the road prism with fabric and gravel) to allow personnel to access the weir site during times when the meadow is wet. Currently, another road has been bermed on the northwest end of the meadow and will be reconnected to the W-200.

This project will be approximately 6 miles east of the proposed Warm Springs River crossing location within the Warm Springs River fifth field watershed.

Project 4

Remove 1 mile of the B-200 Road and an associated culvert where the road crosses the South Fork Warm Springs River. The road prism will be removed completely to rehabilitate the site by reconnecting the floodplain and planting of native vegetation. The stream restoration will occur below the removed culvert, and will include engineered log

jams and other methods to aggrade the stream bed and stabilize the banks. This project will improve fish passage and increase habitat complexity within the South Fork Warm Springs River, which will benefit MCR steelhead and critical habitat. This project is within the Warm Springs River fifth field watershed and is approximately 2.5 miles from the proposed crossing location of the South Fork Warm Springs River.

Project 5

Excavate and re-contour 3 miles of the B-260 Road adjacent to Badger Creek in order to relocate the channel to its historic location. Stream bank restoration and LWD will be placed in the stream to reinforce stream channel modifications. This project is within the Warm Springs River fifth field watershed and will benefit MCR steelhead.

Project 6

Block 4.8 miles of road in the South Fork Warm Springs River drainage using a combination of trenches and native materials (rocks, stumps, cull logs). This project is within the Warm Springs River fifth field watershed and will benefit MCR steelhead and critical habitat.

Project 7

Excavate and re-contour 1 mile of an unnumbered road near the B-180 northwest of the South Fork Warm Springs River and build a new road along the pipeline corridor. This will reduce sediment delivery to the upper South Fork. This project is within the Warm Springs River fifth field watershed.

Project 8

A portion of the large trees with intact root wads and boulders (~18-to 36-inches in diameter) removed from the right-of-way will be used for constructing log jams and other in-stream features in the following streams: Shitike Creek, Boulder Creek, Mill Creek, Badger Creek, South Fork Warm Springs River, and North Fork Warm Springs River. The specific locations in each waterbody will be identified by the CWTS' Fish Habitat Program staff. This will create habitat complexity in these streams that will benefit bull trout and MCR steelhead spawning and rearing habitats. These waterbodies are within the Upper Deschutes River, Mill Creek-Warm Springs River, and Warm Springs River fifth field watersheds.

Project 9

Remove a canal head works structure in Shitike Creek that is not being used. This will improve fish passage into upper Shitike Creek, benefiting bull trout and MCR steelhead. This project is within the Upper Deschutes River fifth field watershed.

Project 10

Remove 1 mile of the B-100 Road where it crosses Badger Creek and restore riparian habitat in the road right-of-way. This project will improve fish passage and rearing for MCR steelhead and lamprey. This project is within the Warm Springs River fifth field watershed.

Project 11

Improve fish passage and habitat connectivity through the Badger Creek culvert on Highway 26. This culvert is currently scouring the streambed on the downstream side and may prevent lamprey from migrating into the upper reaches of Badger Creek. This project is within the Warm Springs River fifth field watershed, approximately 8.4 miles downstream of the proposed Badger Creek crossing location.

f. Information on the environmental baseline conditions of the fifth field watersheds within the Warm Springs Alternative has been included in the revised Warm Springs bull trout analyses and MCR steelhead analyses (Attachments 9-1 and 9-2). Watersheds are included only if the alternative crosses a waterbody with bull trout or MCR steelhead within the watershed. Supporting data and determinations of environmental baseline function for these watersheds are provided in the response to data request #10.

Response by: John Cassady, Palomar Gas Transmission, LLC, (503) 833-4703

ATTACHMENT 9-1

4.0 BULL TROUT

4.1 Species Description

4.1.1 Species Biology and Habitat

Bull trout (*Salvelinus confluentus*) are identified by several characteristics: spots never appear on the dorsal (back) fin, and the spots that rest on the fish's olive green to bronze back are pale yellow, orange, or salmon-colored. The bull trout's tail is not deeply forked. Bull trout exhibit two forms: resident and migratory. Resident bull trout spend their entire lives in the same stream/creek (Behnke, 1992). Migratory bull trout move to larger bodies of water to forage, and then migrate back to smaller waters to reproduce. An anadromous form of bull trout also exists in the Coastal-Puget Sound population (Brenkman and Corbett, 2005; FWS, 2008), which spawns in rivers and streams but rears young in the ocean. Resident and juvenile bull trout prey on invertebrates and small fish. Adult migratory bull trout primarily eat fish (Rieman and McIntyre, 1996). Resident bull trout range up to 10 inches long and migratory forms may range up to 35 inches and up to 32 pounds (FWS, 2008; Brenkman and Corbett, 2005). The historic range of bull trout includes major river basins in the Pacific Northwest from Canada to northern California, and inland in the Jarbridge River in Nevada, as well as Puget Sound and the Columbia and Snake River Basins (FWS, 2002a).

Bull trout have several life history variations. Some bull trout migrate to tributary streams to spawn, with the young rearing from 1 to 4 years before migrating to a lake (known as the adfluvial life history type) or large river (known as the fluvial life history type) (Fraley and Shepard, 1989). Migratory forms tend to occur where conditions allow for movement from spawning areas in upper watersheds to lower parts of watersheds where foraging opportunities are more plentiful (Dunham and Rieman, 1999). Bull trout vary in size depending on their life history type. Resident bull trout tend to be smaller, whereas migratory bull trout are generally larger. Bull trout often live to 10 years (McPhail and Baxter, 1996), and typically reach sexual maturity in 4 to 7 years (FWS, 1998b).

Migration is important for the persistence of many local population segments of bull trout. Migratory corridors that allow bull trout to move from spawning and rearing habitat to foraging and overwintering habitat result in larger, more reproductively successful bull trout (McPhail and Baxter, 1996), and also result in increased dispersion, which improves gene flow. Local populations that are extirpated during catastrophic events can be re-established as a result of bull trout movement through migration corridors (Rieman and McIntyre, 1996).

Most bull trout in the lower Deschutes River subbasin exhibit a fluvial life history pattern and are found from Sherars Falls upstream to the Pelton Reregulating Dam (Brun and Dodson, 2001). Spawning for adult bull trout in this area occurs near the headwaters of Warm Springs River and Shitike Creek. Adults migrate upstream from the Deschutes River to tributaries for spawning between early May and mid-June (Brun and Dodson, 2001). Following spawning, in September, they migrate downstream to the Deschutes River. This migration timing appears similar to the nearby Lake Billy Chinook-Metolius populations (Lewis, 2003).

Juvenile rearing in the tributary streams can last up to 3 years, followed by downstream migration to the Deschutes River. The majority of juveniles leave Shitike Creek from early March through mid-June (Brun and Dodson, 2001).

Bull trout occur in the Pacific Northwest in Washington, Oregon, Idaho, Nevada, Montana, and Canada. Compared to other salmonids, bull trout have more specific habitat requirements. They occur in cold water streams, and are rarely found in waters where temperatures exceed 59 to 64 degrees Fahrenheit

(°F) (FWS, No date). They also require stable stream channels, clean spawning and rearing gravel, complex and diverse cover, as well as migration corridors (McPhail and Baxter, 1996). Populations of bull trout are often distributed in watersheds based on available habitat and may not be connected (Rieman and McIntyre, 1995).

4.1.2 Species Rangewide Status and Threats

Bull trout occur in the Warm Springs Alternative action area. Although bull trout have a fairly wide distribution throughout the Columbia River basin, they occur in low numbers, often with patchy distribution, and many of the populations are in decline (FWS, 2002b). Bull trout were listed as threatened under the ESA in 1998 (FWS, 1998c). In the 1999 Final Ruling, the bull trout were listed as threatened throughout their entire range within the coterminous United States (FWS, 1999). In 2005, the FWS assessed bull trout according to 121 core areas for population abundance, distribution, population trend, and threats (FWS, 2005). The FWS (2008i) determined that there has been no change in the distribution of core areas for bull trout since the ESA listing, although there may have been changes at the smaller, local level. In assessing the status of the 121 core areas, the FWS (2005) determined the following:

- 43 core areas at High Risk (extremely limited and/or rapidly declining numbers, range, and/or habitat; core area highly vulnerable to extirpation);
- 44 core areas At Risk (very limited and/or declining numbers, range, and/or habitat; core area vulnerable to extirpation);
- 28 core areas at Potential Risk (limited and/or declining numbers, range, and/or habitat; bull trout may be locally abundant in some portions of the core area);
- 4 core areas at Low Risk (bull trout common or uncommon, but not rare; usually widespread through the core area. Apparently not vulnerable at this time, but there may be cause for long-term concern); and
- 2 core areas at Unknown Risk (core area currently unranked due to lack of information or due to substantially conflicting information about status and trends).

The factors that have contributed to the decline of bull trout include: restriction of migration routes; forest management practices; grazing; agricultural practices; road construction; mining; introduction of non-native species (including brook trout); and residential development contributing to habitat modification. Poaching is also considered a significant threat. The range of the bull trout has decreased compared to the known historic range. Bull trout are now extirpated in northern California. In areas where bull trout populations occur, many are reduced in size, fragmented, or have been eliminated from the main stems of large rivers (FWS, 2002b). Bull trout can no longer be legally harvested in many areas, but misidentification of bull trout as brook trout or lake trout is resulting in some fish being killed accidentally. Illegal poaching of spawning adults is a problem in some areas (FWS, 1999).

4.2 Status in Action Area

4.2.1 Action Area Relevant to the Species

The FWS defines the action area under Section 7 of the ESA as the areas to be affected directly or indirectly by the project (not just the project footprint). The distance within which construction activities could affect bull trout is anticipated to be the distance that noise generated by construction equipment

travels, as well as the potential distance that sediment could travel downstream (expected to be less than 0.25 mile). With the implementation of sediment containment measures, no downstream sediment effects are expected, but for the purposes of evaluating the action area, a conservative distance of 0.25 mile upstream and downstream is assumed (based on potential noise and sediment effects). Thus, for the bull trout, the action area is the crossings at Shitike Creek and the Deschutes River, and 0.25 mile upstream and downstream of these crossings. At the Deschutes crossing, bull trout may exist in the reservoir between the Reregulation and Pelton dams only if they have survived the turbine or spillway passage from upstream. Bull trout are known to occur within the Reregulation reservoir; however, the population size is unknown. Spawning is unlikely to occur in the reservoir (CTWS, 2004). Presence of bull trout in the project area is shown on figure 4.2.1-1. Although spawning and rearing bull trout occur in the Warm Springs River, their extent is only known to occur up to the confluence of Dry Creek, which is 0.9 mile downstream of the crossing of the river on the Warm Springs Alternative. The Warm Springs River is not considered part of the action area for bull trout, but it is within the action area for Middle Columbia River (MCR) steelhead as this species can be present at the crossing location. The action area overlaps the Upper Deschutes fifth field watershed.

4.2.2 Status of Species

The proposed project will affect bull trout populations in the Deschutes River and Shitike Creek within the Middle Deschutes River watershed (see table 4.2.2-1). As described above, the FWS assessed the status of 121 core areas of bull trout (FWS, 2005). The Lower Deschutes River Core Area for bull trout (part of the Middle Deschutes River watershed) is categorized as "potential risk." The population abundance category is 1,000 to 2,500 individuals, with a distribution range rank of 125 to 620 stream length miles. The short-term trend is increasing. The threat rank is "localized, substantial."

TABLE 4.2.2-1

Palomar Gas Transmission Project
Warm Springs Alternative
Waterbody Crossings with Bull Trout Present

Waterbody Crossing Name/Unique ID	MP	Crossing Type	Stream Type	Lifestage Present			Habitat Feature		
				Migration	Spawning	Rearing	Riparian forest	Habitat Structure (LWD, boulders)	Substrate
Deschutes River JE-SW32W	14.2	WOC	P			X[a]	Y	Boulders	Silt, clay, sand, gravel, cobbles, boulders
Shitike Creek JE-SW1W	29.2	DOC	P	X	X	X	Y	LWD, boulders	Gravel, cobbles, boulders

Source: StreamNet, 2009.
[a] CTWS, 2004

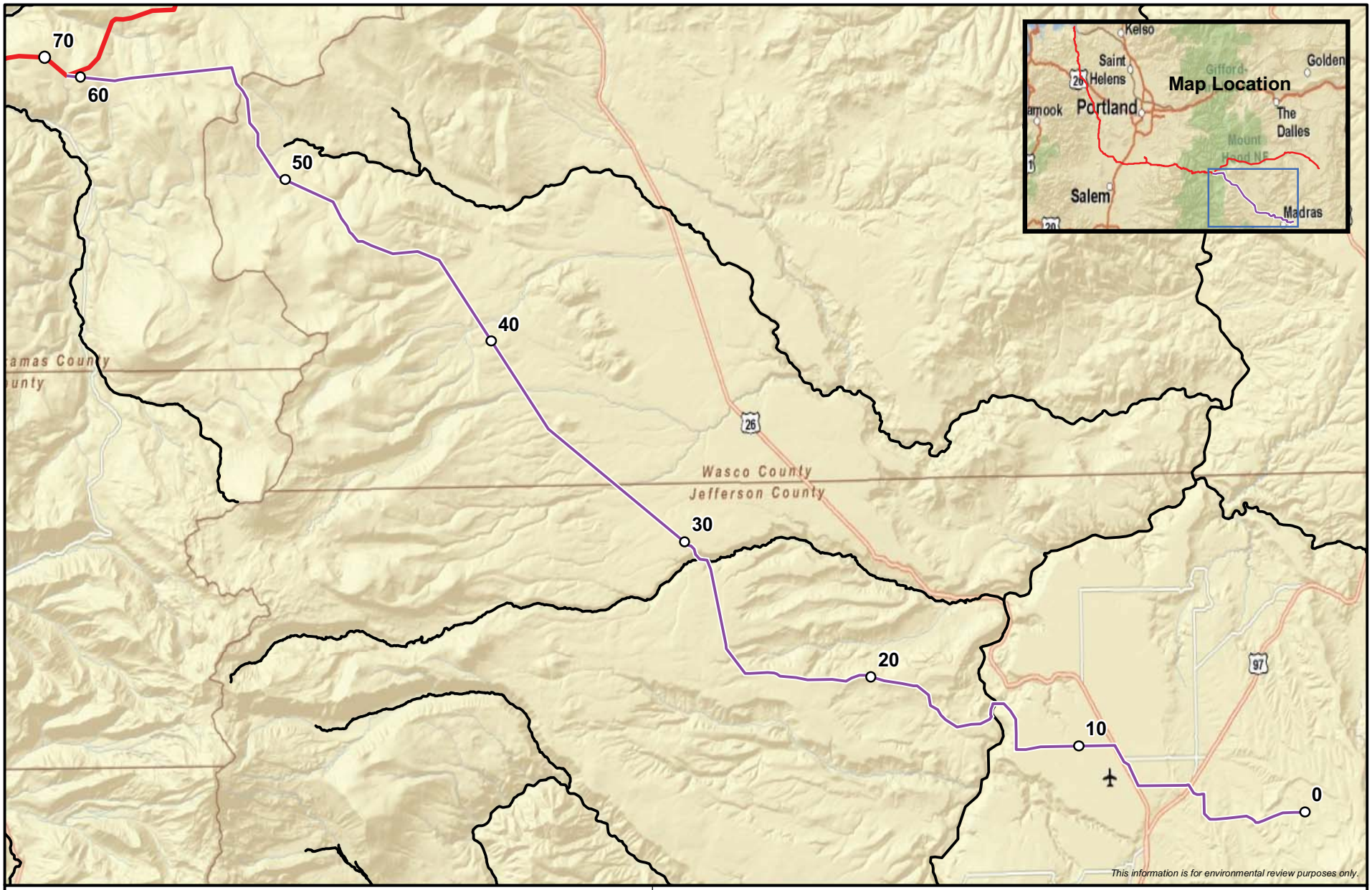

Figure 4.2.1-1
Palomar Gas Transmission Project
Warm Springs Alternative
Bull Trout Presence

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The 2002 Bull Trout Recovery Plan (FWS, 2002a) includes a discussion of the Deschutes River Recovery Unit. The Deschutes Recovery Team identified one core area (i.e., Lower Deschutes Core Area) that consists of the mainstem Deschutes River and its tributaries from Big Falls downstream to the Columbia River. Five local bull trout populations occur in the Lower Deschutes Core Area: Shitike Creek, the Warm Springs River, and three Metolius River population complexes. The upper Deschutes core habitat is generally described as the upper Deschutes River, Little Deschutes River, and other tributaries upstream from Big Falls. The upper Deschutes core habitat does not currently support bull trout populations, but had bull trout historically. The Pelton and Round Butte dams limit gene flow in populations in Shitike Creek, the Warm Springs River, and the Metolius River (FWS, 2002c).

The Warm Springs Alternative will affect the bull trout in the Deschutes River and Shitike Creek. Dams and lack of fish passage greatly restricted and eliminated migrations of upriver groups of bull trout into the lower Deschutes River and tributaries. The population above the Reregulation Dam in the reservoir is unknown, but rearing individuals may occur as they have survived through the turbines and spillway passage from the upstream reservoir (CTWS, 2004). Bull trout abundance has increased in recent years because of restrictive angling regulations and education (Fredenberg and Chan, 2005). Bull trout monitoring studies conducted on the Warm Springs River found that 25 adult bull trout were documented passing the Warm Springs National Fish Hatchery weir in 2001, which has been increasing since 1995 (Brun and Dodson, 2001). An adult trap in Shitike Creek recorded 80 adults in 2001 (Brun and Dodson, 2001).

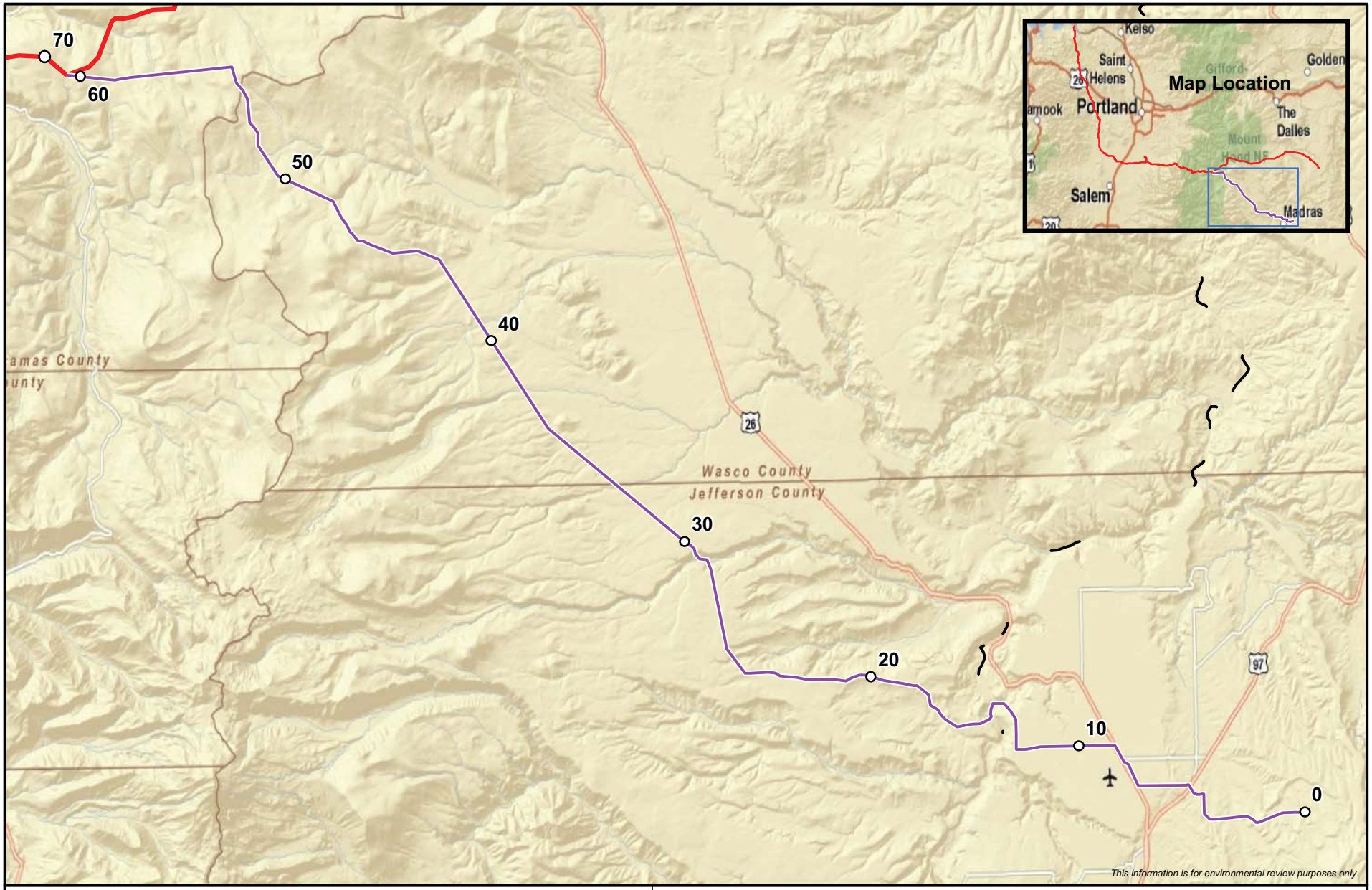
Habitat quality has degraded from historic conditions due to the threats mentioned in previous sections. The greatest habitat quality losses have occurred along lower river/stream reaches. Many Middle Deschutes watershed waterbodies were 303(d) listed for temperature in 2002. Water temperatures of some tributaries can surpass 70 °F in the summer months. Water flows are variable, as they rely heavily on snowmelt. Summer months naturally have lower flows, but these numbers are lowered further by irrigational and recreational water demands (ODFW, 2005b). The mainstream channel of the Deschutes is considered to be very stable; it has not shifted more than 200 feet in the last 90 years (NPCC, 2004b). The proposed project will cross the Deschutes River between the two dams at RM 101.5, where the substrate consists of gravel, cobbles, boulders, and bedrock and the scour hazard level is high when the water level is lower and the historic Deschutes River channel is exposed (MB&G, 2008; Golder, 2009).

4.2.3 Status of Critical Habitat

The Warm Springs Alternative does not cross currently designated bull trout critical habitat (see figure 4.2.3-1). In January 2010, the FWS proposed a new designation of critical habitat for the bull trout (FWS, 2010). If this designation is accepted, Shitike Creek and the Warm Springs River will be designated as critical habitat.

4.2.4 Effect of Past and Ongoing State and Private Actions

PGT's research and agency consultations have not yielded any past or ongoing state or private actions that intersect the Warm Springs Alternative action area and have an effect on this species.



Milepost
Mainline Route
Warm Springs Alternative
Bull Trout Critical Habitat

0 2.5 5 Miles

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palomar

Figure 4.2.3-1
Palomar Gas Transmission Project
Warm Springs Alternative
Bull Trout Critical Habitat

NATURAL RESOURCE GROUP

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4.2.5 Effects of Other Federal Consultations to Date

Built between 1957 and 1964, the Pelton Round Butte Project covers approximately 19,300 acres and physically consists of three developments located on the Deschutes River in central Oregon. The Round Butte Development is the uppermost facility and is situated about 8 miles upstream or south of the Warm Springs Alternative at its nearest point. The Round Butte Dam is a 440-foot-high rock-filled dam along the 4,000-acre Lake Billy Chinook, the project's largest storage reservoir. The Pelton Development consists of a 204-foot-high concrete arch dam on the Deschutes River. The Pelton Dam is located approximately 7 miles downstream from the Round Butte Dam and 1.7 miles upstream or south of the Warm Springs Alternative route. The 540-acre Pelton reservoir, also referred to as Lake Simtustus, originates at the base of the Round Butte Dam. The Reregulating Development is the most downstream development and is located less than 1 mile downstream or north of the Warm Springs Alternative route. The dam consists of an 88-foot-high concrete rock-filled dam and includes a 190-acre reservoir on the Deschutes River that extends approximately 2.5 miles downstream from the tailwater of the Pelton Dam to the Reregulating Dam (FERC, 2004).

This hydroelectric project previously blocked fish passage to and from habitats that were accessible historically. The former license for the Pelton Round Butte Project expired in 2001. Portland General Electric (PGE) and the Confederated Tribes of Warm Springs (CTWS) filed a joint application for a new license for the project in 2001. A consultation process followed that involved a number of other federal, state, and tribal bodies (e.g., ODEQ, Warm Springs Water Control Board, NOAA Fisheries, and BLM). This consultation process included the development of a Biological Opinion (BO) under Section 7 of the ESA for the bull trout. A new 50-year license was issued by FERC on June 21, 2005 (FERC, 2004).

According to the Pelton Round Butte Project's BO, actions addressed in the re-licensing resulted in short-term adverse impacts on bull trout due to construction activities and unforeseen limitations on upstream and downstream fish passage for bull trout. As part of the re-licensing agreement, PGE and the CTWS constructed an underwater tower and fish collection facility approximately 700 feet upstream from Round Butte Dam in order to restore fish passage. The BO concluded that the proposed action is not likely to jeopardize the continued existence of the bull trout. Further, long-term resource protection and enhancement for the bull trout were established through reconnecting bull trout populations via implementing upstream and downstream fish passage, eliminating turbine entrainment at Round Butte Dam, and increasing rearing habitat for bull trout. Overall, these resource protections and enhancements resulted in benefits for the bull trout that were not present prior to re-licensing (FWS, 2004).

4.3 Analysis and Determinations of Effects on the Species

The Warm Springs Alternative could affect bull trout through impacts on water quality, habitat access, habitat elements, stream channel condition, or changes in watershed conditions. Potential effects in these categories are discussed in the sections below. The effects of the Warm Springs Alternative on individual fish are described in the context of the Matrix of Pathways and Indicators (MPI) developed by NMFS (NMFS, 1996a).

The Warm Springs Alternative is *likely to adversely affect* bull trout. The majority of potential impacts on bull trout are summarized in table 4.3-1. Potential impacts that require additional discussion are provided in the sections below, along with action determinations corresponding to the table (i.e., LAA or NLAA). Potential effects listed in table 4.3-1 may have varying degrees of direct and indirect effects on bull trout. Direct effects are those that result in an immediate impact, whereas indirect effects are those that occur later in time. Most of the potential effects on fish associated with the Warm Springs Alternative are associated with waterbody crossings.

The alternative would cross Shitike Creek with a dry open cut method (e.g., flume or dam-and-pump); both of these methods are described in Volume I of the ABDA. PGT will construct the Shitike Creek crossing within the appropriate in-water work window (July 1- August 15) recommended by the CTWS. The Deschutes River will be crossed using a wet open cut method in the Deschutes reservoir within the in-water work window for that waterbody (July 1 – October 31). The Deschutes River valley is bounded on both the east and west sides by relatively flat uplands underlain by basalt bedrock. Blasting may be required along the mid to upper portion of the valley slopes where surface and near-surface hard bedrock may be present and at scattered locations along the lower portions of the valley wall slopes. The Deschutes Reservoir downstream of the Pelton dam is suitable for crossing using the wet, open-cut trench method. The variable nature of the reservoir pool levels may require either additional pipe burial depth or minimal depth with armoring to protect the pipeline at locations where the bottom of the reservoir is exposed during operating cycles and at the location of the old Deschutes River channel. However, in areas that remain permanently inundated and are not effected by scour, burial of the pipeline may not be required. The dam operating procedures and historic reservoir levels will be reviewed along with a detailed topographic and bathymetric survey along the proposed reservoir crossing alignment before completing the final crossing design.

4.3.1 Disturbance

The Warm Springs Alternative is likely to adversely affect individual fish in the bull trout DPS through noise generated by project construction, as well as from construction equipment in and/or near waterbodies. Activities associated with construction of the pipeline could result in increased ambient noise from construction equipment, as well as physical disruption due to disturbance in waterbodies (e.g., during installation of temporary bridges, or during the single pass through a waterbody to set up crossings for construction equipment). Blasting and general construction activities could generate noise that could adversely affect bull trout; however, by implementing conservation measures described below, any effects would be expected to be minimal.

Blasting of the pipeline trench in areas near waterbodies could generate sufficient noise to disturb salmonids in the area, causing them to temporarily move away from the construction area. Attachment 9B-2 of the February 12, 2010 data request response lists the waterbody crossings that could require blasting to excavate the trench (e.g., blasting is either likely to be required or is considered possibly required). For this DPS, the Deschutes River could require blasting, but not Shitike Creek. Because the crossing at the Deschutes Reservoir will be a wet open cut, there is the potential that underwater blasting may be required. Additional effects analysis of underwater blasting in the Deschutes reservoir will be provided, as necessary. The Shitike Creek valley may require blasting in some areas; however, the waterbody crossing may only require ripping due to the substrate composition of gravel, cobbles, and boulders (Golder, 2009; Golder, 2010).

Individual adult and juvenile bull trout may also be affected by construction activities related to waterbody crossings. For the proposed wet open cut crossing at the Deschutes River, impacts could depend on the water level at the time of construction. For the dry crossing method (i.e., flume and dam-and-pump) at Shitike Creek, a fish salvage operation will be implemented prior to completion of dewatering the site and beginning excavation. Qualified fisheries biologists will remove any fish trapped in water remaining in the work area between the dams and release the fish upstream or downstream. Seines and dip nets will be used first to collect fish. Electrofishing equipment will be utilized after seining to maximize the effectiveness of the fish salvage effort. Captured fish will be transported and released downstream from the flume or downstream of the dam. It is unlikely that any adult bull trout will be affected by the waterbody crossings because of the timing of construction and the adherence to in-water work windows, but juveniles may be present year-round. Fisheries biologists conducting the fish salvage operation will be required to have a Section 10 permit under the ESA; therefore, adverse impacts

on juvenile bull trout associated with handling during the fish salvage operation will be addressed separately through the Section 10 process.

Water diversion for hydrostatic testing will comply with all federal and state requirements for water withdrawal and fish screening, which will avoid impacts on bull trout.

4.3.2 Water Quality

Construction of the Warm Springs Alternative could affect bull trout through chemical contamination, water temperature changes, or changes in sediment and turbidity; however, with the implementation of conservation measures, any adverse effects would be reduced. Through implementation of PGT's Plan and Procedures (see Appendices E and G of the ADBA filed in June 2009) and the SPCC Plan (see Appendix I of the ADBA filed in June 2009), chemical contaminants such as fuel spills will not be expected to have an adverse impact on bull trout. Potential contamination impacts associated with hydrostatic testing will be avoided by returning water used for testing to the same water basin it is drawn from. Water withdrawals would be appropriately screened to avoid fish entrainment. No chemicals will be added to the water during hydrostatic testing.

TABLE 4.3-1

Palomar Gas Transmission Project
Bull Trout Effects Analysis

Project Elements			Environmental Impacts	Life Stage Exposed	Length of Exposure	Conservation Measure	Species Habitat Response	Species Response (Individual)	Determination
Pipeline Construction	General/Cross-Action Activities	Human presence, vehicle traffic, & equipment on ROW	Noise, vibration, trash	All life stages	During all construction activities (Timber Removal: September - March; General Pipeline Construction: May - November)	• Noise Compliance in Wetland and Waterbody Construction and Mitigation Procedures.	N/A	Possible temporary dispersal from construction site (away from noise)[a].	NLAA
		Refueling	Spills	All life stages	N/A	• Prohibit refueling within occupied sites. • Clean up contaminated soils as described in the Spill Prevention, Containment, and Control Plan (SPCC Plan).	No response.	No response.	NE
	Timber Removal	Timber removal	Timber removal	All life stages	Life of the project in permanent ROW (50 years)	• Planting trees (Revegetation and Restoration Plan). • Placement of LWD in streams and on streambanks. • Revegetation with native species. • Soil stabilization (Plan and Procedures).	Reduced LWD recruitment to stream.	No measurable response.	LAA
		Timber mat roads	No aquatic impacts	N/A	N/A	N/A	N/A	N/A	NE
		Equipment wash stations	Water quality	Adults, juveniles	During active construction	• Spill prevention methods and precautions will be implemented (SPCC). • Designated wash stations (Plan and Procedures).	No response.	No response.	NE
		Chainsawing	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA
		Helicopter tree cutting (in steep terrain)							
			Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA
		Drag line removal	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA
			Soil disturbance	All life stages	Until stabilized	• Planting trees (Revegetation and Restoration Plan). • Revegetation with native species. • Soil stabilization (Plan and Procedures).	No measurable response.	No measurable response.	NLAA
		Stump grinding	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA
		Burning chip piles	Smoke	N/A	N/A	N/A	N/A	N/A	NE
	Clearing & Grading	Vegetation clearing	Loss of riparian vegetation	All life stages	Until restored in temporary ROW (2+ years), for the life of the project in permanent ROW (50 years)	• Planting trees (Revegetation and Restoration Plan). • Placement of LWD in streams and on streambanks. • Revegetation with native species. • Soil stabilization in Upland Erosion Control, Revegetation, and Maintenance Plan.	No measurable response.	Possible temporary dispersal upstream/downstream until revegetation is complete. [a]	NLAA
		Topsoil & subsoil removal	Erosion by wind/water of piles	All life stages	During active construction	• Install and maintain/monitor erosion control measures in Upland Erosion Control, Revegetation, and Maintenance Plan).	No measurable response.	No response.	NLAA
		Grading	Erosion	Adults, juveniles	During active construction	• Install and maintain/monitor erosion control measures in Upland Erosion Control, Revegetation, and Maintenance Plan.	No measurable response.	No response.	NLAA
		Stump grinding & grubbing	Noise	Adults, juveniles	During active construction	• Noise Compliance in Wetland and Waterbody Construction and Mitigation Procedures.	N/A	Possible temporary dispersal from construction site (away from noise). [a]	NLAA
		Clearspan or rockfill bridge construction (over waterbodies)	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA
			Erosion	Adults, juveniles	During active construction	• Install and maintain/monitor erosion control measures (Plan and Procedures).	No measurable response.	No response.	NLAA

TABLE 4.3-1

Palomar Gas Transmission Project
Bull Trout Effects Analysis

Project Elements			Environmental Impacts	Life Stage Exposed	Length of Exposure	Conservation Measure	Species Habitat Response	Species Response (Individual)	Determination
			Disturbance	All life stages	During active construction	• Install appropriate culverts and/or fish passage components. • Obtain any permits needed, minimize number of equipment crossings.	Potential decreased connectivity between available habitats, changes in flow and water levels, siltation.	Possible impacts on individuals; potential reduced rearing and migration success.	LAA
		Temporary gates and fences installed	N/A	N/A	N/A	N/A	N/A	N/A	NE
	Trenching	Trenching	Erosion	Adults, juveniles	During active construction	• Install and maintain/monitor erosion control measures in Upland Erosion Control, Revegetation, and Maintenance Plan.	No Response.	No Response.	NLAA
		Dewatering	Water quality	All life stages		• All dewatering equipment will be contained and set up at an adequate distance from any waterbody in accordance with the projects Upland Erosion Control, Revegetation, and Maintenance Plan.	No Response.	No Response.	NLAA
		Rock fracturing	Noise	Adults, juveniles		• Noise Compliance in Wetland and Waterbody Construction and Mitigation Procedures.	N/A	Possible temporary dispersal from construction site. [a]	NLAA
		Blasting	Noise	Adults, juveniles	During active construction	• Noise Compliance in Blasting Plan	N/A	Possible temporary dispersal from construction site. [a]	LAA
			Vibration	All life stages	During active construction	• Blasting will occur during in-water work windows in accordance with the project Blasting Plan.	Siltation (risk increased in areas of possible liquefaction), rock and other larger materials introduced to waterbody.	Possible temporary dispersal from construction site (away from noise). [a]	LAA
		Open trench [b]	N/A	N/A	N/A	N/A	N/A	N/A	NE
	Pipe Stringing, Bending, Welding, & Tie-In	Pipe transport along ROW	Noise	Adults, juveniles	During active construction	• Noise Compliance in Wetland and Waterbody Construction and Mitigation Procedures.	N/A	Possible temporary dispersal from construction site (away from noise).[a]	NLAA
		Pipe storage on ROW (skids)							
		Pipe bending							
		Pipe welding							
		Pipe joint coating							
		Pipe jeeping							
	Lowering-in & Backfilling	Dewatering	Water quality	All life stages	During active construction	• All dewatering equipment will be contained and set up at an adequate distance from any waterbody in accordance with PGT's Plan and Procedures.	No response.	No response.	NE
		Placement of padding material	N/A	N/A	N/A	N/A	N/A	N/A	NE
		Pipeline lowering	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA
		Installation of trench breakers	N/A	N/A	N/A	N/A	N/A	Possible temporary dispersal from construction site. [a]	NLAA
		Backfilling	Noise	Adults, juveniles	During active construction	•Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site .[a]	NLAA
	Pressure testing	Water withdrawal	Water depletion	All life stages	During active construction	• Return testing water to source waterbody (Deschutes River and Columbia River). • Obtain any needed permits for water diversion.	No measurable response.	No measurable response.	NLAA
		Fuel storage	Spills	All life stages	N/A	• Prohibit fuel storage within occupied sites. • Clean up contaminated soils as described in the Spill Prevention, Containment, and Control Plan).	No response.	No response.	NE
		Water discharge	Water quality	All life stages	During active construction	• Obtain any need permits for water discharge. • Discharge testing water away from stream (upland location).	No measurable response.	No measurable response.	NLAA
		Pipeline cleaning/drying (pigs)	N/A	N/A	N/A	N/A	N/A	N/A	NE
	Cleanup & Restoration	Construction debris clean-up	Noise	Adults, juveniles	During active construction	• Noise Compliance in Wetland and Waterbody Construction and Mitigation Procedures.	N/A	Possible temporary dispersal from construction site (away from noise). [a]	NLAA
		Removal of timber mats & span bridges	Disturbance	All life stages	During active construction	• No construction equipment will be used in-stream in the process of removing clearspan bridges or timber mats. • Install erosion control devices and restore area to preconstruction conditions (Plan and Procedures).	No measurable response.	No measurable response.	NLAA
		Contouring	Noise	Adults, juveniles	During active	• Noise Compliance in Wetland and Waterbody Construction and Mitigation	N/A	Possible temporary dispersal from	NLAA

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Palomar Gas Transmission Project
Bull Trout Effects Analysis

Project Elements			Environmental Impacts	Life Stage Exposed	Length of Exposure	Conservation Measure	Species Habitat Response	Species Response (Individual)	Determination
					construction	Procedures.		construction site (away from noise). [a]	
		Installation of permanent erosion control devices	N/A	N/A	N/A	N/A	N/A	N/A	NE
		Seeding/ mulching/ reforestation	Noise	Adults, juveniles	During active construction	• Noise Compliance in Wetland and Waterbody Construction and Mitigation Procedures	N/A	Possible temporary dispersal from construction site (away from noise). [a]	NLAA
	Final tie-in	Construction debris clean-up	Noise	Adults, juveniles	During active construction	• Noise Compliance in Wetland and Waterbody Construction and Mitigation Procedures.	N/A	Possible temporary dispersal from construction site (away from noise). [a]	NLAA
		Removal of timber mats & span bridges	Disturbance	All life stages	During active construction	• No construction equipment will be used in-stream in the process of removing clearspan bridges or timber mats. • Install erosion control devices and restore area to preconstruction conditions (Plan and Procedures).	No measurable response.	No measurable response.	NLAA
		Contouring	Noise	Adults, juveniles	During active construction	• Noise Compliance in Wetland and Waterbody Construction and Mitigation Procedures.	N/A	Possible temporary dispersal from construction site (away from noise). [a]	NLAA
		Installation of permanent erosion control devices	N/A	N/A	N/A	N/A	N/A	N/A	NE
		Seeding/ mulching/ reforestation	Noise	Adults, juveniles	During active construction	• Noise Compliance in Wetland and Waterbody Construction and Mitigation Procedures.	N/A	Possible temporary dispersal from construction site (away from noise). [a]	NLAA
	Wetland crossing	Timber mat roads	Sediment	Adults, juveniles	During length of wetland crossing	• Minimize number of equipment crossings. • Install and maintain erosion control measures in accordance with project Upland Erosion Control, Revegetation, and Maintenance Plan.	No measurable response.	No measurable response.	NLAA
			Compaction	N/A	N/A	N/A	N/A	N/A	NE
		Dewatering [b]	Water quality	Adults, juveniles	During length of wetland crossing	•All dewatering equipment will be contained and set up at an adequate distance from any waterbody in accordance with the projects Upland Erosion Control, Revegetation, and Maintenance Plan.	No measurable response.	No measurable response.	NE
		Dewatering equipment off ROW [b]	Spills	All life stages	During length of wetland crossing	• Spill prevention methods in accordance with PGT's SPCC Plan.	No measurable response.	No measurable response.	NLAA
	Waterbody crossing - Dry open cut		Noise	Adults, juveniles	During length of waterbody construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA
			Vibration	Adults, juveniles	During length of waterbody construction	• Limit size of the workspace at the waterbody crossing. • Locate all extra work areas at least 50 feet from waterbody. • Limit time of in-stream disturbance to 24 hours when possible. • Comply with timing restrictions, minimize to the maximum extent possible the number of equipment crossings at each waterbody. • Store hazardous materials at least 150 feet from waterbody. • Restore stream banks and riparian areas to pre-construction conditions.	N/A	Possible temporary dispersal from construction site. [a]	NLAA
			Sediment	Adults, juveniles	During length of waterbody construction		Potential temporary decrease in water quality	Possible impacts on individuals.	LAA
			Waterbody disturbance	Adults, juveniles	During length of waterbody construction		Potential temporary reduction in spawning/rearing/migration habitat.	Possible impacts on individuals; potential reduced rearing and migration success.	LAA
	Waterbody crossing - Wet open cut		Waterbody Disturbance	Adults,	During length of waterbody construction		Potential temporary decrease in water quality	Potential impacts on individuals. Possible temporary dispersal from construction site.	LAA
			Noise	Adults, juveniles	During length of waterbody construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	LAA
			Vibration	Adults, juveniles	During length of waterbody construction	• Limit size of the workspace at the waterbody crossing. • Locate all extra work areas at least 50 feet from waterbody. • Limit time of in-stream disturbance to 24 hours when possible. • Comply with timing restrictions, minimize to the maximum extent possible the number of equipment crossings at each waterbody. • Store hazardous materials at least 150 feet from waterbody. • Restore stream banks and riparian areas to pre-construction conditions.	N/A	Possible temporary dispersal from construction site. [a]	LAA

TABLE 4.3-1

Palomar Gas Transmission Project
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Project Elements			Environmental Impacts	Life Stage Exposed	Length of Exposure	Conservation Measure	Species Habitat Response	Species Response (Individual)	Determination
			Sediment	Adults, juveniles	During length of waterbody construction		Potential temporary decrease in water quality	Possible impacts on individuals.	LAA
Construction of Aboveground Facilities	General/Cross-Action Activities	Human presence, vehicle traffic, & equipment on ROW	N/A	N/A	N/A	N/A	N/A	N/A	NE
		Refueling							
	Meter station	Permanent structures	N/A	N/A	N/A	N/A	N/A	N/A	NE
	Mainline valves	Permanent structures							
	Pig launcher/ receiver	Permanent structures							
Pipe Storage & Contractor Yards	General/Cross-Action Activities	Human presence, vehicle traffic, & equipment in yards	N/A	N/A	N/A	N/A	N/A	N/A	NE
		Refueling	N/A	N/A	N/A	N/A	N/A	N/A	NE
	Yard Preparation	Grading, leveling, & filling	N/A	N/A	N/A	N/A	N/A	N/A	NE
			N/A	N/A	N/A	N/A	N/A	N/A	NE
		Earthen berms	N/A	N/A	N/A	N/A	N/A	N/A	NE
	Materials storage (e.g., pipe, skids, straw bales)	Fuel & lubricant storage	N/A	N/A	N/A	N/A	N/A	N/A	NE
		Pipe storage	N/A	N/A	N/A	N/A	N/A	N/A	NE
	Equipment trailer, & vehicle maintenance	Generators	N/A	N/A	N/A	N/A	N/A	N/A	NE
		Parking	N/A	N/A	N/A	N/A	N/A	N/A	NE
		Repair	N/A	N/A	N/A	N/A	N/A	N/A	NE
Access Roads	General/Cross-Action Activities	Human presence, vehicle traffic, & equipment on ROW	Noise	Adults, juveniles	Length of use of access road	• Noise Compliance in Wetland and Waterbody Construction and Mitigation Procedures.	N/A	No measurable response.	NLAA
			Vibration	Adults, juveniles	Length of use of access road	• Noise Compliance in Wetland and Waterbody Construction and Mitigation Procedures. • Minimize traffic near waterbody.	N/A	No measurable response.	NLAA
			Trash	N/A	N/A	N/A	N/A	N/A	NE
		Refueling	Spills	All life stages	N/A	• Prohibit refueling within occupied sites. • Clean up contaminated soils as described in the Spill Prevention, Containment, and Control Plan.	No response.	No response.	NE
	Road improvements	Grading, graveling, cutting, & filling [b]	Noise	Adults, juveniles	Length of use of access road	• Noise Compliance in Wetland and Waterbody Construction and Mitigation Procedures.	N/A	No measurable response.	NLAA
			Vibration	All life stages	Length of use of access road	• Noise Compliance in Wetland and Waterbody Construction and Mitigation Procedures. • Install and maintain proper erosion control devices in Upland Erosion Control, Revegetation, and Maintenance Plan	No measurable response.	No measurable response.	NLAA
		Installation of culverts [b]	Noise	Adults, juveniles	Length of use of access road	• Noise Compliance in Wetland and Waterbody Construction and Mitigation Procedures.	N/A	No measurable response.	NLAA
			Vibration	All life stages	Length of use of access road	• Minimize traffic near waterbody. • Install and maintain proper erosion control devices in Upland Erosion Control, Revegetation, and Maintenance Plan.	No measurable response.	No measurable response.	NLAA

TABLE 4.3-1

Palomar Gas Transmission Project
Bull Trout Effects Analysis

Project Elements			Environmental Impacts	Life Stage Exposed	Length of Exposure	Conservation Measure	Species Habitat Response	Species Response (Individual)	Determination
		Installation of clearspan bridges	Disturbance	Adults, juveniles	During active construction	• Install erosion control devices and restore area to preconstruction conditions (Plan and Procedures). • No construction equipment will be used in-stream in the process of removing clearspan bridges or timber mats.	No measurable response.	No measurable response.	NLAA
		Chainsawing	Noise	Adults, juveniles	During active construction	• Install erosion control devices and restore area to preconstruction conditions (Plan and Procedures).	N/A	No measurable response.	NLAA
		Tree clearing	Noise	Adults, juveniles	During construction activity	• All personnel will comply with project specific Plan and Procedures. • Minimize traffic near waterbody.	N/A	No measurable response.	NLAA
			Tree removal	All life stages	Until stabilized	• Planting trees (Revegetation and Restoration Plan). • Placement of LWD in streams. • Revegetation with native species. • Soil stabilization (Plan and Procedures).	Reduced LWD recruitment to stream.	Potential reduced rearing and migration success.	LAA
Operation & Maintenance	General/Cross-Action Activities	Human presence, vehicle traffic, & equipment on ROW	Noise	Adults, juveniles	During maintenance activities	• Noise Compliance in Wetland and Waterbody Construction and Mitigation Procedures.	N/A	No measurable response.	NLAA
			Vibration	All life stages	During maintenance activities	• Noise Compliance in Wetland and Waterbody Construction and Mitigation Procedures. • Minimize traffic near waterbody.	N/A	No measurable response.	NLAA
			Trash	N/A	N/A	N/A	N/A	N/A	NE
		Refueling	Spills	All life stages	N/A	• Prohibit refueling within occupied sites. • Clean up contaminated soils as described in the Spill Prevention, Containment, and Control Plan.	No response.	No response.	NE
	Operational safety	Aerial surveys	Noise	Adults, juveniles	During aerial survey	• Conduct aerial surveys during proper timing windows.	N/A	No measurable response.	NLAA
		Pedestrian surveys	N/A	N/A	N/A	N/A	N/A	N/A	NE
	Maintenance	Vegetation clearing	Vegetation removal	All life stages	During maintenance activities	• Revegetation with native species. • Soil stabilization in Upland Erosion Control, Revegetation, and Maintenance Plan.	No measurable response.	No measurable response.	NLAA
		Tree/brush clearing	Vegetation removal	All life stages	During maintenance activities	• Revegetation with native species. • Soil stabilization in Upland Erosion Control, Revegetation, and Maintenance Plan.	No measurable response.	No measurable response.	NLAA
		Upkeep of erosion control devices	N/A	N/A	N/A	N/A	N/A	N/A	NE

[a] This response will not result in a detectable or measureable effect on the individual's survivorship or fitness.

[b] If necessary

NE = No Effect

NLAA = Not Likely To Adversely Affect

LAA = Likely to Adversely Affect

N/A = Not Applicable

Temperature changes associated with removal of riparian vegetation are expected to be negligible, because in areas where riparian vegetation is cleared for the construction right-of-way crossing, there will typically be vegetation upstream and downstream of the crossing site that will continue to provide canopy cover for the stream. During construction across two coldwater, fish-bearing streams in Alberta, Canada where riparian vegetation was removed, water temperatures at the pipeline crossing sites and downstream did not increase above water temperatures at undisturbed sites upstream from the crossings (Brown et al., 2002). Similarly, studies at four coldwater streams in New York before and during pipeline construction and for 3 years following construction showed that the pipeline crossings had no short- or long-term effect on water quality parameters, including water temperature (Blais and Simpson, 1997). If an increase in stream temperature were to occur, the increase will be expected to return to the ambient temperature of the stream within 500 to 1,000 feet downstream (Zwieniecki and Newton, 1999).

Changes to sediment in the stream or increases in turbidity could occur from tree removal, clearing and grading, access road construction and maintenance, upland disturbance of soils or construction equipment operating in or near the waterbody. To prevent sedimentation caused by construction and vehicular traffic crossing waterbodies, PGT will install temporary equipment bridges. Staging areas and additional spoil storage areas will be located at least 50 feet away from the edges of waterbodies not adjacent to actively cultivated or rotated cropland or other disturbed land, unless a specific variance has been requested and approved. Trench spoil excavated from within the waterbody will be placed at least 10 feet from the edge of the waterbody. Sediment control devices (e.g., silt fences, straw bales) will be placed around the spoil piles to keep sediment from entering the waterbody. Sediment travel distance can vary depending on the site-specific condition, but is not expected to travel further than 0.25 mile.

Tree removal and clearing and grading activities associated with the construction right-of-way could disturb soils and increase the potential for erosion and sediment input to waterbodies in the area. Disturbance due to tree removal is primarily associated with heavy equipment during ground-based felling and yarding of logs, and dragging logs during skyline yarding. Typically, helicopter logging does not cause as much soil disturbance as mechanical clearing. Steep, forested portions of the right-of-way that require tree removal will be cleared with the use of helicopter logging. PGT's Timber Removal Plan (see Appendix C of the ADBA filed in June 2009) includes the following conservation measures to reduce potential impacts:

- logs and slash will not be yarded across perennial streams unless fully suspended;
- logs firmly embedded in the bed or bank of waterbodies that are in place prior to felling and yarding of timber will not be disturbed unless they prevent trenching or fluming operations; and
- any existing logs that are removed from waterbodies to construct the pipeline crossing will be returned to the waterbody after the pipeline has been installed, backfilling is complete, and during the time the streambanks are being restored.

Construction or improvements of access roads for timber removal and pipeline construction activities could result in impacts on salmonid habitat by increasing sediment load to the stream, changing the stream channel morphology, destabilizing streambanks, or restricting fish passage. Impacts associated with access roads will be reduced by using existing roads and limiting improvements of roads to previously disturbed areas, to the extent possible. Access roads used for construction will either have a paved surface (some of the existing roads are paved), or will be maintained with crushed aggregate material that is sourced from excavation of the project.

An increase in turbidity in a stream can impact fish and macroinvertebrates. At moderate levels, turbidity can interfere with productivity of the stream; at higher levels, turbidity can cause direct effects by interfering with feeding and gill function (Berg and Northcote, 1985). Sediment input to a stream that exceeds the transport capacity can cause stream channel instability or aggradation, widening, loss of pools, and decrease in gravel quality (Cederholm and Reid, 1987; Swanston, 1991). These impacts can reduce salmon spawning and rearing success by reducing food abundance, over-wintering habitat, and negatively affecting spawning redds (Cederholm and Reid, 1987). By implementing the sediment containment measures contained in PGT's Plan and Procedures and Timber Removal Plan, potential adverse effects on bull trout would be minimized.

4.3.3 Habitat Access

The Warm Springs Alternative is not likely to adversely affect individual bull trout in terms of habitat access. The Warm Springs Alternative will not create any long-term barriers to migration or access to migration, spawning, rearing, or foraging habitat; therefore, adverse effects on bull trout associated with habitat access are not expected to occur. Waterbody crossings will be restored to their pre-construction condition following completion of the crossing, and any constructed access roads will be maintained, including any needed culverts, to preserve fish passage in waterbodies in the project area. The wet open cut method on the Deschutes River is not anticipated to create habitat access issues for bull trout because the population within the reservoir is not migratory due to their containment. PGT will construct the Shitike Creek crossing within the appropriate in-water work window (July 1- August 15) recommended by the CTWS. Construction in Shitike Creek (e.g., flumed or dam-and-pump crossing) could temporarily interfere with use of the habitat in the immediate vicinity of the crossing, but construction will not affect adults because migration does not take place during the in-water work window.

4.3.4 Habitat Elements

The Warm Springs Alternative is likely to adversely affect individual bull trout in terms of habitat elements. Habitat elements potentially affected by the project include temporary removal of LWD and large trees near the waterbody, which represent future recruitment of LWD. Clearing the construction right-of-way for waterbody crossings will include temporary removal of obstructions such as large logs, particularly at the Shitike Creek crossing. These materials will be retained on-site to the extent possible and replaced at the completion of construction. Timber removal will include clearing trees within 75 to 120 feet of the waterbody (i.e., the construction right-of-way will typically be 120 feet wide, but will be reduced to 75 feet at waterbody crossings). Vegetation removal would include 3.0 acres of riparian habitat near waterbodies (i.e., within a site potential tree distance) with bull trout present (Deschutes River and Shitike Creek). Attachment 9D-2 of the February 12, 2010 data request response lists all of the waterbodies that are within a site-potential tree height of the construction footprint, as well as additional details on the riparian vegetation present (the table lists all waterbodies within a site-potential tree height, whether or not there are anadromous salmonids present in the waterbody).

Removal of trees within the site-potential tree height of the waterbody (e.g., a distance equal to the potential height of a tree in the surrounding habitat) can reduce future recruitment of LWD to the stream; thereby reducing future habitat structures for salmonids. To offset potential net loss of LWD in waterbodies, as well as the reduced future recruitment of LWD due to timber removal along the construction right-of-way, additional LWD will be placed in waterbodies at appropriate locations at the completion of construction. Pieces of LWD will be sourced from conifers removed as part of clearing the right-of-way. LWD structures will be naturally anchored to the streambank by placing the majority of the log length on the floodplain, keying the log into streamside trees, or connecting the log to other log structures nearby in the waterbody. The number and frequency of structures placed at waterbody

crossings will be consistent with the upstream and downstream conditions prior to construction.

Implementation of PGT's Revegetation and Restoration Plan (see Appendix D of the ADBA filed in June 2009) will reduce the potential impacts on salmonids from reduced recruitment of future LWD into waterbodies. Because replanted trees will in some cases take many years to reach a similar age class, and because LWD recruitment is currently limited in many watersheds due to past logging and land management practices (Swanston, 1991), removal of large trees within a site-potential tree distance of waterbodies, including Shitike Creek, may have an adverse effect on bull trout.

4.3.5 Channel Condition

With the implementation of conservation measures, the Warm Springs Alternative is not likely to adversely affect bull trout with respect to channel conditions. Evaluation of channel condition effects includes potential effects on streambanks and waterbody channels. Implementation of PGT's Plan and Procedures, including restoring the waterbody channel to pre-construction conditions will reduce the potential for impacts. After the pipe has been installed in a waterbody, the trench will be backfilled with the native material that was excavated from the trench. Larger rock and or boulders will be replaced in the stream channel within the construction area if they were removed prior to construction. The streambed profile will be restored to pre-existing contours and grade conditions to prevent scouring. Once the streambed is restored, the stream banks will be restored as near as possible to pre-existing conditions and grade; stabilized; and either seeded, planted with trees, and/or rip-rapped as necessary to stabilize the slope. Permanent erosion control devices such as rock riprap or gabion baskets (rock enclosed in wire bins) may be installed as necessary on steep waterbody banks. Temporary erosion controls will be installed immediately following in-water construction, and will be inspected and maintained until vegetation restoration is complete. Additional details regarding the analysis and design of waterbody crossings is provided in section 2.3.12 of Volume I of the ADBA filed in June 2009.

4.3.6 Watershed Conditions

The Warm Springs Alternative is not likely to adversely affect individual bull trout in terms of changes to watershed conditions. The Columbia River DPS crosses one Hydrologic Unit Code (HUC) 5 watershed within the proposed action area with fish presence: the Upper Deschutes River. Waterbodies crossed within this watershed include irrigation ditches, canals, ephemeral or intermittent tributaries, one perennial stream (Shitike Creek), and the Reregulating Reservoir along the Deschutes River.

The Upper Deschutes River watershed was listed on the 303(d) list for temperature (year round and seasonal) and for dissolved oxygen (ODEQ, 2006). However, in 2004 the parameters for temperature (year round) for bull trout and dissolved oxygen for salmonid spawning were removed from the 303(d) list. Under the 2004/2006 303(d) list the only parameter is temperature from September 1 through June 30 for salmonid spawning (ODEQ, 2006). The water quality limited segment includes the Deschutes River up to the Reregulating Dam within this HUC 5 boundary. The crossing location is at the Reregulating Reservoir, which already experiences significant water level and temperature changes due to seasonal storage and withdrawals.

The watershed is known to have a variety of streambank conditions ranging from a deep, narrow valley with rimrock along the Deschutes River to channel instability along Deschutes tributaries (DBCG, 2004). Land use practices (including road crossings) have reduced habitat complexity and riparian areas impacting the floodplain. Snowmelt creates flashy flows within the watershed (DBCG, 2004). The turbidity created from the unstable channel banks and land use practices are amplified by these flashy flows. However, with implementation of erosion control and streambank stabilization measures during construction, the proposed project is not likely to affect watershed turbidity levels. The presence of

LWD, pools, and off-channel habitat have been greatly diminished from the watershed's historical levels due to land use practices and man-made barriers including the Pelton Round Butte Complex (DBCG, 2004 and NWPCC, 2004)). Placement of additional LWD in Shitike Creek as part of the proposed project's conservation measures could increase the overall amount of LWD available as in-stream habitat in the watershed.

4.4 Mitigation

Adverse impacts on bull trout may not be completely preventable through the avoidance and minimization measures incorporated into the proposed action by PGT ((e.g., construction timing, isolating work areas, fish salvage, revegetation)). PGT proposes compensatory mitigation actions to offset unavoidable, adverse impacts that the Warm Springs Alternative would have on these species. Mitigation would include road decommissioning, side channel habitat restoration, LWD placement, and riparian restoration. A description of the compensatory mitigation actions proposed for the Warm Springs Alternative is provided in the response to number 9e of the February 12, 2010 data request.

4.5 Cumulative Effects

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA. There are no known state, tribal, local or private actions that are reasonably certain to occur in the action area for the Warm Springs Alternative.

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ATTACHMENT 9-2

2.0 MIDDLE COLUMBIA RIVER STEELHEAD AND CRITICAL HABITAT

2.1 Species and Critical Habitat Description

2.1.1 Species Biology and Habitat

Adult steelhead can weigh as much as 55 pounds and can reach lengths of up to 45 inches, however, the average size is much smaller. Steelhead are dark olive with white or silver undersides. Their bodies are thickly speckled and have a red/pink stripe along the length of their sides. Steelhead that migrate to the ocean develop a pointier head, are more silver in color, and grow to be larger than steelhead that remain in freshwater all their lives (NMFS, 2008b).

In freshwater and estuarine habitats, steelhead feed on small crustaceans, insects, and small fishes. Once in the ocean, steelhead eat a range of prey items including other fish, crustaceans, and squid (Behnke, 2002).

Steelhead distribution ranges from Alaska to southern California. Steelhead can be either anadromous or resident (staying in fresh water), and accordingly, have one of the most complex life history types of any of the Pacific salmonids. Resident forms are referred to as rainbow or redband trout. Those that are anadromous can spend up to 7 years in fresh water prior to migrating to sea, and spend up to 3 years in salt water before returning to spawn. Another life history variation is the ability of this species to spawn more than once, whereas most other species of Pacific salmon spawn once and then die (NMFS, 1996b). In the Pacific Northwest, steelhead that enter fresh water between May and October are considered summer steelhead, and steelhead that enter fresh water between November and April are considered winter steelhead. Variations in migration timing exist between populations, although there is considerable overlap. Some river basins have both summer and winter steelhead; others have only one type (PFMC, 1996). The most widespread run type of steelhead is the winter steelhead. Winter steelhead occur in most coastal rivers of Washington, Oregon, and California. Steelhead in the inland Columbia River Basin are mostly summer steelhead (NMFS, 1996b).

According to the Conservation and Recovery Plan for Oregon Steelhead Populations in the Middle Columbia River (MCR) Steelhead DPS (Carmichael, 2008), steelhead enter the Columbia River from June to August and ascend rivers and tributaries throughout the winter months. Steelhead spend up to a year in freshwater before spawning in late winter to early spring. Emergence occurs between May and the end of June, and steelhead spend between 1 and 4 years in freshwater before heading to the ocean. Smolting usually occurs at age two. Steelhead spend 1 to 2 years in saltwater before returning to their natal streams.

2.1.2 Species Rangewide Status and Threats

The MCR steelhead DPS includes all steelhead in the Columbia River Basin upstream of the Wind River in Washington and the Hood River in Oregon to the Yakima River in Washington. The Hood River basin and Snake River basin are not included in this DPS (NMFS, 1996b). The Deschutes steelhead hatchery programs are included in the ESA-listed DPS (Good et al., 2005). The MCR steelhead DPS includes the only populations of inland winter steelhead in the United States, which are present in the Klickitat River, White Salmon River, and Fifteenmile Creek (NMFS, 2008c).

The historical abundance of this DPS may have been higher than 300,000 fish (NMFS, 1996b). The total abundance was estimated around 200,000 by the early 1980s, and by the early 1990s the average abundance was around 142,000, of which 39,000 were naturally produced. Total steelhead abundance in the DPS appears to have been increasing recently, and the naturally produced component

has been relatively stable. However, the majority of the natural stocks in the DPS are declining, including those in the John Day River, which is the largest producer of natural-origin steelhead in the DPS. Total run size for the John Day River may be higher than 5,000 fish (NMFS, 1996b). Since 1998, total run size to the John Day River has increased from 6,300 to over 24,000 in 2002. There is particular concern about Yakima River and winter steelhead stocks. Winter steelhead are reported within this DPS only in the Klickitat River, Rock Creek, and Fifteenmile Creek, and therefore represent an important, unique life history form. They may be extirpated from the White Salmon River (NMFS, 2008c).

Current population sizes in this DPS are substantially lower than historic levels, especially in the rivers with the largest MCR steelhead runs in the ESU: the John Day, Deschutes, and Yakima Rivers. The John Day may be the most robust of these three populations (NMFS, 1996b). At least two extinctions of native wild steelhead runs in the ESU have occurred, the Crooked and Metolius Rivers, both in the Deschutes River basin (NMFS, 1999a). The loss of these runs is due primarily to blockage of the migration corridor by the Pelton-Round Butte Project (NMFS, 1999a).

MCR steelhead are divided into two categories; Deschutes River East and Deschutes River West. Threats associated with the Deschutes River East population affect all life stages of MCR steelhead, and include reduced habitat quality and quantity, reduced water quality and quantity, and impaired fish passage (Carmichael, 2008). Loss of habitat quality and quantity can be attributed to various factors. Poor floodplain conditions and reduction in beaver populations in this area have reduced the amount of available off-channel habitat for juvenile rearing. Past and present land management practices are also a contributor. Agriculture, urbanization, and road construction all lead to vegetation removal and the reduction of available large wood (Carmichael, 2008). Land management practices have also reduced the amount of water in eastside streams for irrigation and urbanization (Northwest Power and Conservation Council (NPCC), 2004b). Fish passage for Deschutes River Eastside populations is impaired by road crossings and push-up dams (during irrigation season). Many road culverts still have barriers in place. Storage reservoirs may also prevent passage (Carmichael, 2008).

Threats associated with the Deschutes River Westside population affect all life stages of MCR steelhead. These threats include reduced habitat quality and quantity, reduced water quality and quantity, and impaired fish passage (Carmichael, 2008). Loss of habitat quantity and quality is more apparent on the lower reaches of the Deschutes River (NPCC, 2004b). Off-channel habitats provide important steelhead spawning habitat for the Westside population; however, losses of channel connectivity due to land management practices (especially road construction) has reduced the availability of these habitats. Agriculture, urbanization, and road construction have all lead to decreased amount of large wood available for habitat (Carmichael, 2008).

The majority of natural MCR steelhead populations are considered at moderate risk for abundance and productivity, but low to moderate risk for spatial structure and diversity. The MCR steelhead DPS has one highly viable population (North Fork John Day River), two viable populations (Fifteenmile Creek and Deschutes River Eastside), five at high risk of extinction within 100 years (Deschutes Westside, Upper Yakima mainstem, Naches River, Rock Creek, and Touchet), with the rest of the populations considered moderate risk (NMFS, 2008c).

The MCR steelhead DPS was listed under the ESA as threatened in 1999; this listing status was reaffirmed in 2006 (NMFS, 1999a; NMFS, 2006a).

2.1.3 Critical Habitat PCEs

In the proposed critical habitat designation for steelhead, NMFS identified the following primary constituent elements (PCEs) (NMFS, 2004a):

- freshwater spawning sites with adequate water quality for spawning, egg incubation, and development of larvae;
- freshwater rearing sites with sufficient water quantity, floodplain connectivity, and physical habitat structure (e.g., LWD, boulders) to support juvenile development;
- freshwater migratory corridors free of obstruction, with water quality and physical habitat structure to support juvenile and adult movement and survival;
- estuarine areas free of obstructions, with water quantity and quality to support adult and juvenile physiological transitions between fresh and saltwater, as well as growth and maturation of juveniles;
- nearshore marine areas free of obstruction, with water quantity and quality, as well as foraging (including aquatic invertebrates and fishes) to support growth and maturation; and
- offshore marine areas with water quality conditions and foraging that supports growth and maturation.

Designated critical habitat for MCR steelhead includes all Columbia River estuarine areas and river reaches in the following sub-basins: Upper Yakima, Naches, Lower Yakima, Middle Columbia/Lake Wallula, Walla Walla, Umatilla, Middle Columbia/Hood, Klickitat, Upper John Day, North Fork John Day, Middle Fork John Day, Lower John Day, Lower Deschutes, Trout, and Upper Columbia/Priest Rapids (NMFS, 2005b). There are 114 watersheds within the range of this DPS.

2.2 Status in Action Area

2.2.1 Action Area Relevant to the Species and its Critical Habitat

The action area under Section 7 of the ESA consists of the areas to be affected directly or indirectly by the project (not just the project footprint). For the potential effects of the project on MCR steelhead, the area potentially affected includes the waterbodies crossed within the ESU (described below) at the crossing locations, and the distance upstream and downstream that could potentially be affected. The distance within which construction activities could affect MCR steelhead is anticipated to be the distance that noise generated by construction equipment travels, as well as the potential distance that sediment could travel downstream (expected to be less than 0.25 mile). With the implementation of sediment containment measures, no downstream sediment effects are expected, but for the purposes of evaluating the action area, a conservative distance of 0.25 mile upstream or downstream is assumed (based on potential noise and sediment effects). Presence of MCR steelhead in the project area is shown on figure 2.2.1-1.

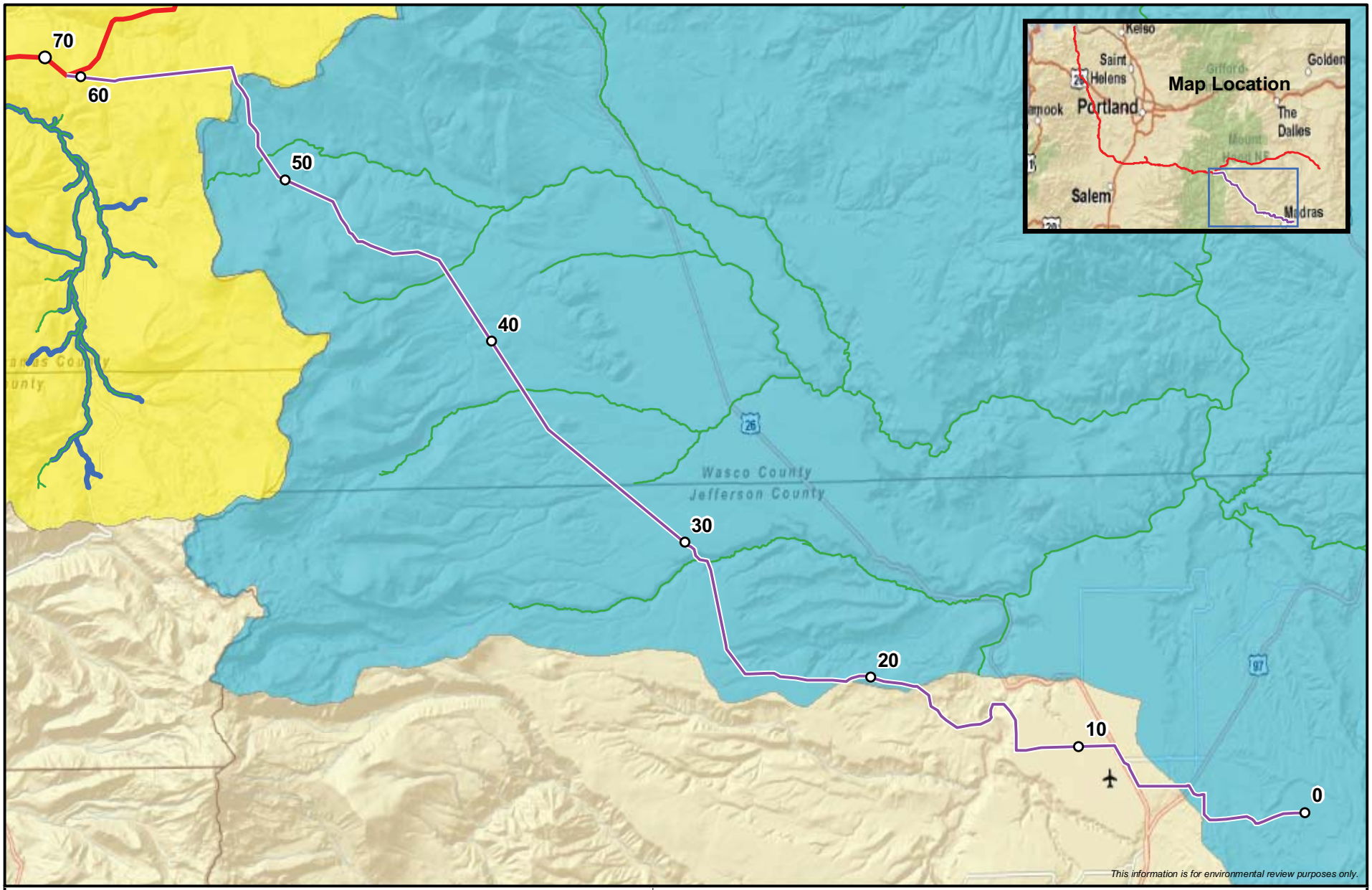

Figure 2.2.2-1
Palomar Gas Transmission Project
Warm Springs Alternative
Middle Columbia River Steelhead DPS Presence

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2.2.1 Status of Species

The Warm Springs Alternative will affect the Deschutes River West population as described in the MCR Recovery plan (NMFS, 2008c). The Deschutes River West Population is present within Shitike Creek (Upper Deschutes River watershed); Mill Creek (Mill Creek-Warm Springs River watershed); and South Fork Warm Springs River and Warm Springs River (Warm Springs River Watershed) (see table 2.2.2-1).

TABLE 2.2.2-1

Palomar Gas Transmission Project
Warm Springs Alternative
Waterbody Crossings with Middle Columbia River Steelhead Present

					Lifestage Present			Habitat Features		
Waterbody Crossing Name/Unique ID	Run	MP	Crossing Type	Stream Type	Migration	Spawning	Rearing	Riparian forest	Habitat Structure (LWD, boulders)	Substrate
Shitike Creek JE-SW1W	summer	29.2	DOC	P	X	X	X	Y	LWD, boulders	Gravel, cobbles, boulders
Mill Creek WS-SW5W	summer	38.0	DOC	P	X	X	X	Y	LWD, boulders	Gravel, cobbles, boulders
South Fork Warm Springs River WS-SW13W	summer	42.9	DOC	P	X	X	X	Y	LWD	Silt, cobbles
Warm Springs River WS-SW22W	summer	51.1	WOC	I	X	X	X	Y	LWD	Silt, clay, gravel,cobbles

Source: StreamNet, 2009.

The Deschutes River West population can be classified as large to intermediate, depending on the amount of currently accessible habitat and historically accessible habitat. A large size classification indicates that the population requires a threshold of 1,500 natural spawners with sufficient productivity to maintain a 95 percent chance of avoiding extirpation in a 100-year timeframe (ODFW, 2006a). Based on adult spawning steelhead in natural production areas, abundance from 1978 through 2005 was estimated to range from 157 (1996) to 1,605 (2003) (ODFW, 2006a). This estimate was based on spawning data for wild fish upstream of the Warm Springs fish hatchery barrier in the Warm Springs River; wild and hatchery fish in Shitike Creek; and wild and hatchery fish that remain in the mainstem Deschutes River between the mouth of Trout Creek and the Pelton Re-regulation Dam (ODFW, 2006a).

Habitat quality has degraded from historic conditions due to threats mentioned in section 2.1.2. The greatest habitat quality losses have occurred along lower river/stream reaches. Many Westside Deschutes waterbodies were 303(d) listed for temperature in 2002. Water temperatures of some tributaries can surpass 70 °F in the summer months. Water flows are variable in westside tributaries, as they rely heavily on snowmelt. Summer months naturally have lower flows, but these numbers are lowered further by irrigational and recreational water demands. The mainstream channel of the Deschutes is considered to be very stable; it has not shifted more than 200 feet in the last 90 years (NPCC, 2004b).

Portland General Electric (PGE) and the Confederated Tribes of Warm Springs (CWTS) are currently working on a project to restore anadromous fish passage around Pelton Dam and Round Butte Dam, which is upstream of the project action area (FERC, 2004; FWS, 2004)). This project could

potentially expand available habitat in the Deschutes River for this DPS of steelhead through a fish passage program. Additional information will be provided to address this steelhead presence above the dams, as necessary. For additional information, see the Federal Consultations to Date section in the bull trout analysis for the Warm Springs alternative.

2.2.3 Status of Critical Habitat

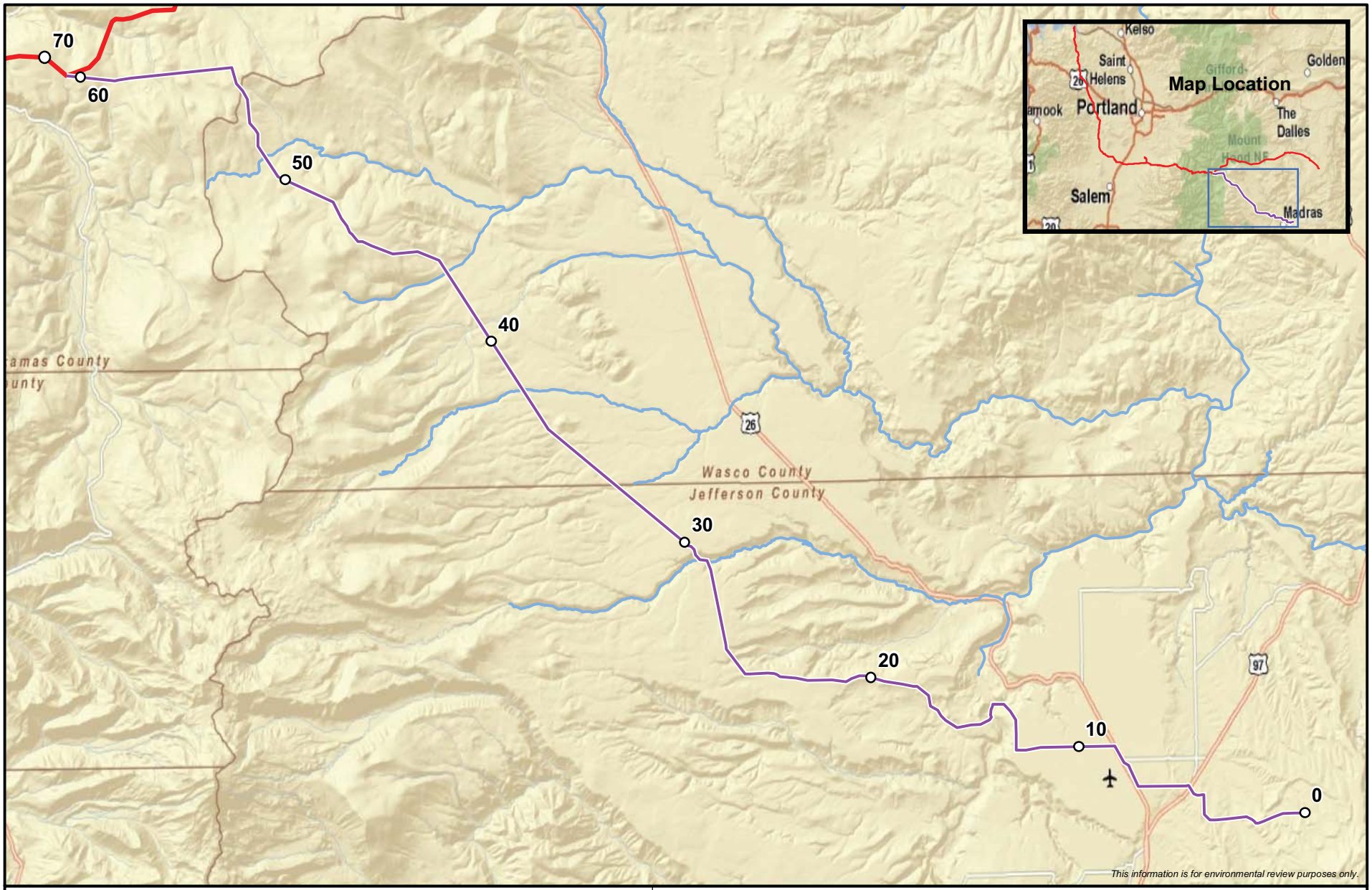
MCR steelhead can be found in the proposed waterbody crossings within the action area: Shitike Creek, Mill Creek, South Fork Warm Springs River, and Warm Springs River. All of these waterbodies have been designated as critical habitat (NMFS, 2005b). Critical habitat for MCR steelhead in the project area is shown on figure 2.2.3-1. Of the six PCEs used to designated critical habitat for the MCR steelhead DPS, only three are included within this action area: freshwater spawning, freshwater rearing, and freshwater migratory habitat. There are no estuarine, nearshore, or offshore habitats affected by the action area.

2.2.4 Effect of Past and Ongoing State and Private Actions

PGT's research and agency consultations have not yielded any past or ongoing state or private actions that intersect the Palomar Project action area and have an effect on this species.

2.2.5 Effects of Other Federal Consultations to Date

The Pelton Round Butte Project is relevant to MCR steelhead in that restoration of upstream and downstream fish passage will also be targeted at MCR steelhead (FERC, 2004; FWS, 2004). Details on the project are provided in the bull trout analysis for the Warm Springs Alternative. Additional analysis of effects on the MCR steelhead that includes additional waterbodies above the dams will be provided, as necessary.



Milepost
Mainline Route
Warm Springs Alternative
Middle Columbia DPS Critical Habitat

0 2.5 5 Miles

N

Figure 2.2.3-1
Palomar Gas Transmission Project
Warm Springs Alternative
Middle Columbia River Steelhead DPS Critical Habitat

palomar

NATURAL RESOURCE GROUP

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2.3 Analysis and Determinations of Effects on the Species and Critical Habitat

The Warm Springs Alternative could affect MCR steelhead through impacts on water quality, habitat access, habitat elements, stream channel condition, flow/hydrology, or changes in watershed conditions. Potential effects in these categories are discussed in the sections below. The effects of the Warm Springs Alternative on individual fish and their critical habitat are described in the context of the MPI developed by NMFS (NMFS, 1996a).

The majority of potential impacts on MCR steelhead are summarized in table 2.3-1. Potential impacts that require additional discussion are provided in the sections below, along with action determinations corresponding to the table (i.e., *likely to adversely affect* or *not likely to adversely affect*). Potential effects listed in table 2.3-1 may have varying degrees of direct and indirect effects on ESA-listed salmonids and their critical habitat. Direct effects are those that result in an immediate impact, whereas indirect effects are those that occur later in time. Most of the potential effects on fish associated with the proposed project are associated with waterbody crossings. Attachment 9A-2 of the February 12, 2010 data request response (revised Appendix R) provides a list of waterbody crossings and crossing type by ESU/DPS, including waterbodies with salmonids present and tributaries that will be crossed within 0.25 mile of waterbodies with salmonids present. Attachment 9D-2 of the February 12, 2010 data request response contains a list of waterbodies that are within a site-potential tree height of the construction footprint, as well as additional details on the riparian vegetation present (the table lists all waterbodies within a site-potential tree height, whether or not there are anadromous salmonids present in the waterbody).

The Warm Springs Alternative is *likely to adversely affect* MCR steelhead, and is *likely to adversely affect* steelhead critical habitat. Components of the proposed project that could result in adverse effects on these species and their critical habitat include timber removal (e.g., LWD recruitment) and in-stream equipment to install temporary equipment bridges and isolate work areas for waterbody crossings. These potential impacts are described below in additional detail consistent with the MPI developed by NMFS.

TABLE 2.3-1

Palomar Gas Transmission Project
MCR Steelhead Effects Analysis

Project Elements			Environmental Impacts	Life Stage Exposed	Length of Exposure	Conservation Measure	Species Habitat Response	Species Response (Individual)	Determination	Critical Habitat Response	Determination
Pipeline Construction	General/Cross-Action Activities	Human presence, vehicle traffic, & equipment on ROW	Noise, vibration, trash	All life stages	During all construction activities (Timber Removal: June - December; General Pipeline Construction: May - November)	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA	N/A	NE
		Refueling	Spills	All life stages	N/A	• Prohibit refueling within occupied sites. • Clean up contaminated soils as described in the Spill Prevention, Containment, and Control Plan (SPCC Plan).	No response.	No response.	NE	No response.	NE
	Timber Removal	Timber removal	Timber removal	All life stages	Life of the project in permanent ROW (50 years)	• Planting trees (Revegetation and Restoration Plan). • Placement of LWD in streams and on streambanks. • Revegetation with native species. • Soil stabilization (Plan and Procedures).	Reduced LWD recruitment to stream.	No measurable response.	LAA	Reduced freshwater habitat structure.	LAA
		Timber mat roads	No aquatic impacts	N/A	N/A	N/A	N/A	N/A	NE	N/A	NE
		Equipment wash stations	Water quality	Adults, juveniles	During active construction	• Spill prevention methods and precautions will be implemented (SPCC). • Designated wash stations (Plan and Procedures).	No response.	No response.	NE	No response.	NE
		Chainsawing	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA	N/A	NE
		Helicopter tree cutting (in steep terrain)	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA	N/A	NE
		Drag line removal	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA	N/A	NE
			Soil disturbance	All life stages	Until stabilized	• Planting trees (Revegetation and Restoration Plan). • Revegetation with native species. • Soil stabilization (Plan and Procedures).	No measurable response.	No measurable response.	NLAA	No measurable response.	NLAA
		Stump grinding	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA	N/A	NE
		Burning chip piles	Smoke	N/A	N/A	N/A	N/A	N/A	NE	N/A	NE
	Clearing & Grading	Vegetation clearing	Loss of riparian vegetation	All life stages	Until restored in temporary ROW (2+ years), for the life of the project in permanent ROW (50 years)	• Planting trees (Revegetation and Restoration Plan). • Placement of LWD in streams and on stream banks. • Revegetation with native species. • Soil stabilization (Plan and Procedures).	No measurable response.	Possible temporary dispersal upstream/downstream until revegetation is complete. [a]	NLAA	No measurable response.	NLAA
		Topsoil & subsoil removal	Erosion by wind/water of piles	All life stages	During active construction	• Install and maintain/monitor erosion control measures (Plan and Procedures).	No measurable response.	No response.	NLAA	No measurable response.	NLAA
		Grading	Erosion	Adults, juveniles	During active construction	• Install and maintain/monitor erosion control measures (Plan and Procedures).	No measurable response.	No response.	NLAA	No measurable response.	NLAA
		Stump grinding & grubbing	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA	N/A	NE
		Clearspan or rockfill bridge construction (over waterbodies)	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA	N/A	NE
			Erosion	Adults, juveniles	During active construction	• Install and maintain/monitor erosion control measures (Plan and Procedures).	No measurable response.	No response.	NLAA	No measurable response.	NLAA
			Disturbance	All life stages	During active construction	• Install appropriate culverts and/or fish passage components. • Obtain any permits needed, minimize number of equipment crossings.	Potential decreased connectivity between available habitats, changes in flow and water levels, siltation.	Possible impacts on individuals; potential reduced rearing and migration success.	LAA	Potential disruption of freshwater spawning, rearing, and migration habitat.	LAA
		Temporary gates and fences installed	N/A	N/A	N/A	N/A	N/A	N/A	NE	N/A	NE
	Trenching	Trenching	Erosion	Adults, juveniles	During active construction	• Install and maintain/monitor proper control measures (Plan and Procedures).	No response.	No response.	NE	No response.	NE
		Dewatering	Water Quality	All life stages		• All dewatering equipment will be contained and set up at an adequate distance from any waterbody in accordance with PGT's Plan and Procedures.	No response.	No response.	NE	No response.	NE
		Rockfracturing	Noise	Adults, juveniles		• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA	N/A	NE

TABLE 2.3-1

Palomar Gas Transmission Project
MCR Steelhead Effects Analysis

Project Elements			Environmental Impacts	Life Stage Exposed	Length of Exposure	Conservation Measure	Species Habitat Response	Species Response (Individual)	Determination	Critical Habitat Response	Determination
		Blasting	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible impacts on individuals; potential reduced rearing and migration success.	LAA	N/A	NE
			Vibration	All life stages	During active construction	• Blasting will occur during in-water work windows in accordance with PGT's Blasting Plan.	Siltation (risk increased in areas of possible liquefaction), rock and other larger materials introduced to waterbody.	Possible impacts on individuals; potential reduced rearing and migration success.	LAA	Potential disruption of freshwater spawning, rearing, and migration habitat.	LAA
		Open trench [b]	N/A	N/A	N/A	N/A	N/A	N/A	NE	N/A	NE
	Pipe Stringing, Bending, Welding, & Tie-In	Pipe transport along ROW	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site .[a]	NLAA	N/A	NE
		Pipe storage on ROW (skids)									
		Pipe bending									
		Pipe welding									
		Pipe joint coating									
		Pipe jeeping									
	Lowering-in & Backfilling	Dewatering	Water quality	All life stages	During active construction	• All dewatering equipment will be contained and set up at an adequate distance from any waterbody in accordance with PGT's Plan and Procedures.	No response.	No response.	NE	No response.	NE
		Placement of padding material	N/A	N/A	N/A	N/A	N/A	N/A	NE	N/A	NE
		Pipeline lowering	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA	N/A	NE
		Installation of trench breakers	N/A	N/A	N/A	N/A	N/A	Possible temporary dispersal from construction site. [a]	NLAA	N/A	NE
		Backfilling	Noise	Adults, juveniles	During active construction	•Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site .[a]	NLAA	N/A	NE
	Pressure testing	Water withdrawal	Water depletion	All life stages	During active construction	• Return testing water to source waterbody (Deschutes River and Columbia River). • Obtain any needed permits for water diversion.	No measurable response.	No measurable response.	NLAA	No measurable response.	NLAA
		Fuel storage	Spills	All life stages	N/A	• Prohibit fuel storage within occupied sites. • Clean up contaminated soils as described in the SPCC Plan.	No response.	No response.	NE	No response.	NE
		Water discharge	Water depletion	All life stages	During active construction	• Obtain any need permits for water diversion. • Discharge testing water away from stream (upland location).	No measurable response.	No measurable response.	NLAA	No measurable response.	NLAA
		Pipeline cleaning/drying (pigs)	N/A	N/A	N/A	N/A	N/A	N/A	NE	N/A	NE
	Cleanup & Restoration	Construction debris clean-up	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA	N/A	NE
		Removal of timber mats & span bridges	Disturbance	All life stages	During active construction	• No construction equipment will be used in-stream in the process of removing clearspan bridges or timber mats. • Install erosion control devices and restore area to preconstruction conditions (Plan and Procedures).	No measurable response.	No measurable response.	NLAA	No measurable response.	NLAA
		Contouring	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA	N/A	NE
		Installation of permanent erosion control devices	N/A	N/A	N/A	N/A	N/A	N/A	NE	N/A	NE
		Seeding/ mulching/ reforestation	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA	N/A	NE
	Final tie-in	Construction debris clean-up	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA	N/A	NE
		Removal of timber mats & span bridges	Disturbance	All life stages	During active construction	• No construction equipment will be used in-stream in the process of removing clearspan bridges or timber mats. • Install erosion control devices and restore area to preconstruction conditions (Plan and Procedures).	No measurable response.	No measurable response.	NLAA	No measurable response.	NLAA

TABLE 2.3-1

Palomar Gas Transmission Project
MCR Steelhead Effects Analysis

Project Elements			Environmental Impacts	Life Stage Exposed	Length of Exposure	Conservation Measure	Species Habitat Response	Species Response (Individual)	Determination	Critical Habitat Response	Determination
		Contouring	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA	N/A	NLAA
		Installation of permanent erosion control devices	N/A	N/A	N/A	N/A	N/A	N/A	NE	N/A	NE
		Seeding/ mulching/ reforestation	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA	N/A	NE
	Wetland crossing	Timber mat roads	Sediment	Adults, juveniles	During length of wetland crossing	• Minimize number of equipment crossings. • Install and maintain erosion control measures in accordance with project Plan and Procedures.	No measurable response.	No measurable response.	NLAA	No measurable response.	NLAA
			Compaction	N/A	N/A	N/A	N/A	N/A	NE	N/A	NE
		Dewatering [b]	Water quality	Adults, juveniles	During length of wetland crossing	•All dewatering equipment will be contained and set up at an adequate distance from any waterbody in accordance with the projects Plan and Procedures.	No response.	No response.	NE	No response.	NE
		Dewatering equipment off ROW [b]	Spills	All life stages	During length of wetland crossing	• Spill prevention methods in accordance with PGT's SPCC Plan.	No measurable response.	No measurable response.	NLAA	No measurable response.	NLAA
	Waterbody crossing - Dry open cut		Noise	Adults, juveniles	During length of waterbody construction	• Noise Compliance (Plan and Procedures).	N/A	Possible temporary dispersal from construction site. [a]	NLAA	N/A	
			Vibration	Adults, juveniles	During length of waterbody construction	• Limit size of the workspace at the waterbody crossing. • Locate all extra work areas at least 50 feet from waterbody. • Limit time of in-stream disturbance to 24 hours when possible. • Comply with timing restrictions; minimize to the maximum extent possible the number of equipment crossings at each waterbody. • Store hazardous materials at least 150 feet from waterbody. • Restore stream banks and riparian areas to pre-construction conditions.	N/A	Possible temporary dispersal from construction site. [a]	NLAA	N/A	
			Sediment	Adults, juveniles	During length of waterbody construction		Potential temporary decrease in water quality	Possible impacts on individuals.	LAA	Potential temporary disruption of freshwater spawning, rearing, and migration habitat.	LAA
			Waterbody disturbance	Adults, juveniles	During length of waterbody construction		Potential temporary reduction in spawning/rearing/migration habitat.	Possible impacts on individuals; potential reduced rearing and migration success.	LAA	Potential disruption of freshwater spawning, rearing, and migration habitat.	LAA
Construction of Aboveground Facilities	General/Cross-Action Activities	Human presence, vehicle traffic, & equipment on ROW	N/A	N/A	N/A	N/A	N/A	N/A	NE	N/A	NE
		Refueling									
	Meter station	Permanent structures	N/A	N/A	N/A	N/A	N/A	N/A	NE	N/A	NE
	Mainline valves	Permanent structures									
	Pig launcher/ receiver	Permanent structures									
Pipe Storage & Contractor Yards	General/Cross-Action Activities	Human presence, vehicle traffic, & equipment in yards	Noise	All life stages	During active construction	• Noise Compliance (Plan and Procedures).	N/A	No measurable response.	NLAA	N/A	NE

TABLE 2.3-1

Palomar Gas Transmission Project
MCR Steelhead Effects Analysis

Project Elements			Environmental Impacts	Life Stage Exposed	Length of Exposure	Conservation Measure	Species Habitat Response	Species Response (Individual)	Determination	Critical Habitat Response	Determination
		Refueling	Spills	All life stages	N/A	• Prohibit refueling within occupied sites. • Clean up contaminated soils as described in the SPCC Plan.	No response.	No response.	NE	No response.	NE
	Yard Preparation	Grading, leveling, & filling	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures). • Minimize traffic near waterbody.	N/A	No measurable response.	NLAA	N/A	NE
			Ground disturbance	All life stages	During active construction	• Install and maintain erosion control devices in accordance with project Plan and Procedures.	Siltation, decrease in water quality.	No measurable response.	NLAA	No measurable response.	NLAA
		Earthen berms	N/A	N/A	N/A	N/A	N/A	N/A	NE	N/A	NE
	Materials storage (e.g., pipe, skids, straw bales)	Fuel & lubricant storage	Potential spills	All life stages	N/A	• Prohibit fuel and lubricant storage within occupied sites. • Clean up contaminated soils as described in the SPCC Plan.	No response.	No response.	NE	No response.	NE
		Pipe storage	N/A	N/A	N/A	N/A	N/A	N/A	NE	N/A	NE
	Equipment trailer, & vehicle maintenance	Generators	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures). • Keep generators away from waterbodies.	N/A	No measurable response.	NLAA	N/A	NE
		Parking	N/A	N/A	N/A	N/A	N/A	N/A	NE	N/A	NE
		Repair	N/A	N/A	N/A	N/A	N/A	N/A	NE	N/A	NE
Access Roads	General/Cross-Action Activities	Human presence, vehicle traffic, & equipment on ROW	Noise, Vibration, Trash	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	No measurable response.	NLAA	N/A	NE
		Refueling	Spills	All life stages	N/A	• Prohibit refueling within occupied sites. • Clean up contaminated soils as described in the SPCC Plan	No response.	No response.	NE	No response.	NE
	Road improvements	Grading, graveling, cutting, & filling [b]	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	No measurable response.	NLAA	N/A	NE
			Vibration	All life stages	During active construction	• Noise Compliance (Plan and Procedures). • Install and maintain proper erosion control devices (Plan and Procedures).	No measurable response.	No measurable response.	NLAA	N/A	NE
		Installation of culverts [b]	Noise	Adults, juveniles	During active construction	• Noise Compliance (Plan and Procedures).	N/A	No measurable response.	NLAA	N/A	NE
			Vibration	All life stages	During active construction	• Minimize traffic near waterbody. • Install and maintain proper erosion control devices (Plan and Procedures).	No measurable response.	No measurable response.	NLAA	No measurable response.	NLAA
		Installation of clearspan bridges [b]	Disturbance	Adults, juveniles	During active construction	• Install erosion control devices and restore area to preconstruction conditions (Plan and Procedures). • No construction equipment will be used in-stream in the process of removing clearspan bridges or timber mats.	No measurable response.	No measurable response.	NLAA	No measurable response.	NLAA
		Chainsawing [b]	Noise	Adults, juveniles	During active construction	• Install erosion control devices and restore area to preconstruction conditions (Plan and Procedures).	N/A	No measurable response.	NLAA	N/A	NE
		Tree clearing [b]	Noise	Adults, juveniles	During construction activity	• All personnel will comply with project specific Plan and Procedures. • Minimize traffic near waterbody.	N/A	No measurable response.	NLAA	N/A	NE
			Tree removal	All life stages	Until stabilized	• Planting trees (Revegetation and Restoration Plan). • Placement of LWD in streams. • Revegetation with native species. • Soil stabilization (Plan and Procedures).	Reduced LWD recruitment to stream.	Potential reduced rearing and migration success.	LAA	Reduced freshwater habitat structure.	LAA
Operation & Maintenance	General/Cross-Action Activities	Human presence, vehicle traffic, & equipment on ROW	Noise	Adults, juveniles	During maintenance activities	• Noise Compliance (Plan and Procedures).	N/A	No measurable response.	NLAA	N/A	NE
			Vibration	All life stages	During maintenance activities	• Noise Compliance (Plan and Procedures). • Minimize traffic near waterbody.	N/A	No measurable response.	NLAA	N/A	NE
			Trash	N/A	N/A	N/A	N/A	N/A	NE	N/A	NE
		Refueling	Spills	All life stages	N/A	• Prohibit refueling within occupied sites. • Clean up contaminated soils as described in the SPCC Plan.	No response.	No response.	NE	No response.	NE
	Operational safety	Aerial surveys	Noise	Adults, juveniles	During aerial survey	• Conduct aerial surveys during proper timing windows.	N/A	No measurable response.	NLAA	N/A	NE
		Pedestrian surveys	N/A	N/A	N/A	N/A	N/A	N/A	NE	N/A	NE
	Maintenance	Vegetation clearing	Vegetation removal	All life stages	During maintenance activities	• Revegetation with native species. • Soil stabilization (Plan and Procedures).	No measurable response.	No measurable response.	NLAA	No measurable response.	NLAA
		Tree/brush clearing	Vegetation removal	All life stages	During maintenance activities	• Revegetation with native species. • Soil stabilization (Plan and Procedures).	No measurable response.	No measurable response.	NLAA	No measurable response.	NLAA
		Upkeep of erosion	N/A	N/A	N/A	N/A	N/A	N/A	NE	N/A	NE

TABLE 2.3-1

Palomar Gas Transmission Project
MCR Steelhead Effects Analysis

Project Elements	Environmental Impacts	Life Stage Exposed	Length of Exposure	Conservation Measure	Species Habitat Response	Species Response (Individual)	Determination	Critical Habitat Response	Determination
control devices									

[a] This response will not result in a detectable or measureable effect on the individual's survivorship or fitness.

[b] If necessary.

NE = No Effect

NLAA = Not Likely To Adversely Affect

LAA = Likely to Adversely Affect

N/A = Not Applicable

2.3.1 Disturbance

The Warm Springs Alternative is likely to adversely affect individual fish in the MCR steelhead DPS through noise generated by project construction, as well as from construction equipment in and/or near waterbodies. Critical habitat for the MCR steelhead will not be adversely affected. Activities associated with construction of the pipeline could result in increased ambient noise from construction equipment, as well as physical disruption due to disturbance in waterbodies (e.g., during installation of temporary bridges, or during the single pass through a waterbody to set up crossings for construction equipment). Blasting and general construction activities could generate noise that could adversely affect MCR steelhead; however, any effects would be expected to be minimal.

Although underwater blasting is not anticipated to occur in any waterbodies with MCR steelhead presence, blasting of the pipeline trench in areas near waterbodies could generate sufficient noise to disturb salmonids in the area, causing them to temporarily move away from the construction area. Attachment 9B-2 of the February 12, 2010 data request response lists the waterbody crossings that could require blasting to excavate the trench (e.g., blasting is either likely to be required or is considered possibly required). In the vicinity of the MCR steelhead DPS, Warm Springs River could require blasting. The Warm Springs River is planned for crossing by the flume or dam-and-pump method. This will avoid the need for underwater blasting, as the trench will be excavated after isolation of the work area from the waterbody.

Individual MCR steelhead juveniles could also be affected by construction activities related to waterbody crossings. For dry crossing methods (i.e., flume and dam-and-pump), a fish salvage operation will be implemented prior to completion of dewatering the site and beginning excavation. Qualified fisheries biologists will remove any fish trapped in water remaining in the work area between the dams and release the fish upstream or downstream. Seines and dip nets will be used first to collect fish. Electrofishing equipment will be utilized after seining to maximize the effectiveness of the fish salvage effort. Captured fish will be transported and released downstream from the flume or downstream of the dam. Fisheries biologists conducting the fish salvage operation will be required to have a Section 10 permit under the ESA; therefore, adverse impacts on juvenile steelhead associated with handling during the fish salvage operation will be addressed separately through the Section 10 process. In this DPS vicinity, timber removal activities are scheduled to occur between May and September of the first year of construction. With regard to the timing of pipeline construction, PGT currently plans to perform all construction activities at flowing waterbody crossings within the designated in-water work windows, minimizing the potential for disturbance impacts during sensitive spawning and/or migration periods. The Warm Springs River is classified as intermittent at the proposed crossing location. If it is dry at the time of construction, it may be crossed outside of the designated in-water work window. If water is present, it will be crossed during the in-water work window to minimize impacts on fish. Construction activities during July and August could affect rearing juveniles, but activities during other months of the year could have increased effects on spawning adults and young-of-the-year fry.

2.2.3 Water Quality

Construction of the Warm Springs Alternative could affect MCR steelhead through chemical contamination, water temperature changes, or changes in sediment and turbidity; however, with the implementation of conservation measures, any adverse effects would be reduced. Through implementation of PGT's Plan and Procedures and the SPCC Plan, chemical contaminants such as fuel spills or debris from construction equipment will not be expected to have an adverse impact on salmonids or their critical habitat. Potential contamination impacts associated with hydrostatic testing will be avoided by returning water used for testing to the same source it is drawn from. Water withdrawals will

be appropriately screened to avoid fish entrainment. No chemicals will be added to the water during testing.

Temperature changes associated with removal of riparian vegetation are expected to be negligible, because in areas where riparian vegetation is cleared for the construction right-of-way crossing, there will typically be vegetation upstream and downstream of the crossing site that will continue to provide canopy cover for the stream. During construction across two coldwater, fish-bearing streams in Alberta, Canada where riparian vegetation was removed, water temperatures at the pipeline crossing sites and downstream did not increase above water temperatures at undisturbed sites upstream from the crossings (Brown et al., 2002). Similarly, studies at four coldwater streams in New York before and during pipeline construction and for 3 years following construction showed that the pipeline crossings had no short- or long-term effect on water quality parameters, including water temperature (Blais and Simpson, 1997). If an increase in stream temperature were to occur, the increase will be expected to return to the ambient temperature of the stream within 500 to 1,000 feet downstream (Zwieniecki and Newton, 1999).

Changes to sediment in the stream or increases in turbidity could occur from tree removal, clearing and grading, access road construction and maintenance, upland disturbance of soils, or construction equipment operating in or near the waterbody. To prevent sedimentation caused by construction and vehicular traffic crossing waterbodies, PGT will install temporary equipment bridges. Staging areas and additional spoil storage areas will be located at least 50 feet away from the edges of waterbodies not adjacent to actively cultivated or rotated cropland or other disturbed land, unless a specific variance has been requested and approved. Trench spoil excavated from within the waterbody will be placed at least 10 feet from the edge of the waterbody. Sediment control devices (e.g., silt fences, straw bales) will be placed around the spoil piles to keep sediment from entering the waterbody. Sediment travel distance can vary depending on the site-specific condition, but is not expected to travel further than 0.25 mile.

Tree removal and clearing and grading activities associated with the construction right-of-way could disturb soils and increase the potential for erosion and sediment input to waterbodies in the area. Disturbance due to tree removal is primarily associated with heavy equipment during ground-based felling and yarding of logs, and dragging logs during skyline yarding. Typically, helicopter logging does not cause as much soil disturbance as mechanical clearing. Steep, forested portions of the right-of-way that require tree removal will be cleared with the use of helicopter logging. PGT's Timber Removal Plan (see Appendix C of the ADBA filed in June 2009) includes the following conservation measures to reduce potential impacts:

- logs and slash will not be yarded across perennial streams unless fully suspended;
- logs firmly embedded in the bed or bank of waterbodies that are in place prior to felling and yarding of timber will not be disturbed unless they prevent trenching or fluming operations; and
- any existing logs that are removed from waterbodies to construct the pipeline crossing will be returned to the waterbody after the pipeline has been installed, backfilling is complete, and during the time the streambanks are being restored.

Construction or improvements of access roads for timber removal and pipeline construction activities could result in impacts on salmonid habitat by increasing sediment load to the stream, changing the stream channel morphology, destabilizing streambanks, or restricting fish passage. Impacts associated with access roads will be reduced by using existing roads and limiting improvements of roads to

previously disturbed areas, to the extent possible. Access roads used for construction will either have a paved surface (some of the existing roads are paved), or will be maintained with crushed aggregate material that is sourced from excavation of the project.

An increase in turbidity in a stream can impact fish and macroinvertebrates. At moderate levels, turbidity can interfere with productivity of the stream; at higher levels, turbidity can cause direct effects by interfering with feeding and gill function (Berg and Northcote, 1985). Sediment input to a stream that exceeds the transport capacity can cause stream channel instability or aggradation, widening, loss of pools, and decrease in gravel quality (Cederholm and Reid, 1987; Swanston, 1991). These impacts can reduce salmon spawning and rearing success by reducing food abundance, over-wintering habitat, and negatively affecting spawning redds (Cederholm and Reid, 1987). By implementing the sediment containment measures contained in PGT's Plan and Procedures and Timber Removal Plan, potential adverse effects on MCR steelhead and MCR steelhead critical habitat would be minimized.

Decreases in water quality have occurred along the lower river/stream reaches of the Deschutes River and its tributaries. Water temperatures of some tributaries can exceed 70 degrees Fahrenheit (°F) in the summer months. Water flows are heavily influenced by snowmelt in westside tributaries and are highly variable. Summer months naturally have lower flows, but additional decreases in flow occur due to irrigational and recreational water demands (NPCC, 2004).

2.3.3 Habitat Access

Access to the upper Deschutes River and other tributaries was eliminated with the construction of Pelton Dam. Steelhead have unrestricted access to the major and minor tributaries to the lower Deschutes River, such as Shitike Creek, Warm Springs River, Trout Creek, Bakeoven Creek, and Buck Hollow Creeks (NPCC, 2004). The Warm Springs Alternative crosses Shitike Creek, Mill Creek, South Fork Warm Springs River, and Warm Springs River.

The PCEs for all Pacific salmon species include adequate access to freshwater migration, spawning, and rearing habitat. The proposed project will not create any long-term barriers to migration or access to spawning and rearing habitat; therefore, adverse effects on MCR steelhead and steelhead critical habitat associated with habitat access are not expected to occur. Waterbody crossings will be restored to their pre-construction condition following completion of the crossing, and any constructed access roads will be maintained, including any needed culverts, to preserve fish passage in waterbodies in the project area. During construction, dry crossing methods across waterbodies (i.e., flumed crossings or dam-and-pump crossings) and temporary access bridges for construction equipment could temporarily impede passage or interfere with use of the habitat in the immediate vicinity of the crossing. Waterbodies with MCR steelhead presence will be constructed within the appropriate in-water work window. All other waterbodies without listed salmonids within 0.25 mile of the crossing will be constructed between early June and late October. The earlier and later part of this timeframe (June, September, and October) will overlap with spawning and rearing of these species, but barriers to migration due to waterbody crossings due to construction would be short-term.

2.3.4 Habitat Elements

The draft recovery plan for MCR steelhead (National Marine Fisheries Service (NMFS), 2008c) lists degraded tributary habitat, including channel structure and complexity, as a primary limiting factor for MCR steelhead in the Deschutes area. The lower Deschutes River and tributaries have been affected by riparian vegetation loss, reduced habitat complexity, reduced large woody debris habitat, and fine sediment deposition on spawning substrates in the tributaries.

The Warm Springs Alternative is not likely to adversely affect individual MCR steelhead in terms of habitat elements, but is likely to adversely affect critical habitat for MCR steelhead. Habitat elements potentially affected by the project include habitat structures such as LWD. Clearing the construction right-of-way for waterbody crossings will include temporary removal of obstructions such as large logs. These materials will be retained on-site to the extent possible and replaced at the completion of construction. Timber removal will include clearing trees within 75 to 120 feet of the waterbody (i.e., the construction right-of-way will typically be 120 feet wide, but will be reduced to 75 feet at waterbody crossings). Vegetation removal would include 4.7 acres of riparian habitat near waterbodies (i.e., within a site potential tree distance) with MCR steelhead present. Attachment 9D-2 of the February 12, 2010 data request response lists all of the waterbodies that are within a site-potential tree height of the construction footprint, as well as additional details on the riparian vegetation present (the table lists all waterbodies within a site-potential tree height, whether or not there are anadromous salmonids present in the waterbody).

Removal of trees within the site-potential tree height of the waterbody (e.g., a distance equal to the potential height of a tree in the surrounding habitat) can reduce future recruitment of LWD to the stream; thereby reducing future habitat structures for salmonids. To offset any potential net loss of LWD in waterbodies, as well as the reduced future recruitment of LWD due to timber removal along the construction right-of-way, additional LWD will be placed in waterbodies at appropriate locations at the completion of construction. Pieces of LWD will be sourced from conifers removed as part of clearing the right-of-way. LWD structures will be naturally anchored to the streambank by placing the majority of the log length on the floodplain, keying the log into streamside trees, or connecting the log to other log structures nearby in the waterbody. The number and frequency of structures placed at waterbody crossings will be consistent with the upstream and downstream conditions prior to construction.

Implementation of PGT's Revegetation and Restoration Plan (see Appendix D of the ADBA filed in June 2009) will reduce the potential impacts on salmonids from reduced recruitment of future LWD into waterbodies. Because replanted trees will in some cases take many years to reach a similar age class, and because LWD recruitment is currently limited in many watersheds due to past logging and land management practices (Swanston, 1991), removal of large trees within a site-potential tree distance of waterbodies may have an adverse effect on MCR steelhead, as well as an adverse effect on MCR steelhead critical habitat.

2.3.5 Channel Condition

Streams in the Deschutes River area historically contained complex channel habitat with off-channel habitat and wet meadows. Grazing impacts on riparian habitat and streambanks has affected stream channels and floodplain connectivity, and flashy flows in the tributaries have contributed to scour and channel instability in several tributaries (NMFS, 2008c).

With the implementation of conservation measures, the project is not expected to adversely affect MCR steelhead or its critical habitat with respect to channel conditions. Evaluation of channel condition effects includes potential effects on streambanks and waterbody channels. Implementation of PGT's Plan and Procedures, including restoring the waterbody channel to pre-construction conditions will reduce the potential for impacts. After the pipe has been installed in a waterbody, the trench will be backfilled with the native material that was excavated from the trench. Larger rock and or boulders will be replaced in the stream channel within the construction area if they were removed prior to construction. The streambed profile will be restored to pre-existing contours and grade conditions to prevent scouring. Once the streambed is restored, the stream banks will be restored as near as possible to pre-existing conditions and grade; stabilized; and either seeded, planted with trees, and/or rip-rapped as necessary to stabilize the slope. Permanent erosion control devices such as rock riprap or gabion baskets (rock

enclosed in wire bins) may be installed as necessary on steep waterbody banks. Temporary erosion controls will be installed immediately following bank restoration and inspected and maintained until vegetation restoration is complete. Additional details regarding the analysis and design of waterbody crossings is provided in section 2.3.12 of Volume I of the ADBA.

2.3.6 Watershed Conditions

The Deschutes watershed includes approximately 760 miles of perennial streams and 1,440 miles of intermittent streams. Major tributaries entering the Deschutes River from the west side include Shitike Creek, White River, and Warm Springs River. These streams drain the eastern slopes of the Cascade Mountains. Major tributaries entering the lower Deschutes River from the east include Trout, Bakeoven, and Buck Hollow creeks. These tributaries drain the Ochoco Mountains and high Columbia plateau (NPCC, 2004).

The Deschutes watershed contains several large parcels of public land. The USFS manages 235 square miles in the White River watershed, or 11 percent of the lower Deschutes River watershed. The Ochoco National Forest manages 27 square miles of land in the headwaters of the Trout Creek drainage. The USFS also manages about 23 square miles of the Crooked River National Grasslands in the Trout Creek drainage. The Bureau of Land Management (BLM) manages about 4 percent of the watershed, mostly along the lower 20 miles of Deschutes River and along the White River. Major land uses on federal lands are timber management, livestock grazing, and recreation. The State of Oregon manages approximately 2 percent of the lower Deschutes River watershed. State lands are managed for recreation, fish and wildlife needs, and livestock grazing (NPCC, 2004).

Private lands make up 62 percent of the lower watershed, mostly in the middle and lower drainage. These lands are generally managed for agricultural and range use. Several small irrigated areas border the Deschutes River between North Junction and the Reregulating Dam. Livestock grazing is common in the lower Deschutes River canyon above River Mile (RM) 20 and in tributaries (NPCC, 2004).

Combined riparian and upland habitat degradation has resulted in a modified flow regime in which there are higher peak flows and lower base flows. Flows now fluctuate more than they did historically. Reduced stream flows are considered a major limiting factor for the Deschutes area populations of MCR steelhead (NMFS, 2008c).

The Warm Springs Alternative is not likely to adversely affect individual MCR steelhead or adversely affect steelhead critical habitat in terms of changes to watershed conditions. The Middle Columbia River DPS crosses seven Hydrologic Unit Code (HUC) 5 watersheds within the Warm Springs Alternative action area: Mud Springs Creek, Willow Creek, Upper Deschutes River, Mill Creek-Warm Springs River, Warm Springs River, Oak Grove Fork Clackamas River, and Upper Clackamas River. Of these HUC 5 watersheds crossed, only Upper Deschutes River, Mill Creek-Warm Springs River, and Warm Springs River have fish presence at or within 0.25 mile of a waterbody crossing.

Waterbodies crossed within the Upper Deschutes River watershed include irrigation ditches, canals, ephemeral or intermittent tributaries, one perennial stream (Shitike Creek) and the Reregulating Reservoir along the Deschutes River. The Upper Deschutes River watershed was listed on the 303(d) list for temperature (year round and seasonal) and for dissolved oxygen (ODEQ, 2006). However, in 2004 the parameters for temperature (year round) for bull trout and dissolved oxygen for salmonid spawning were removed from the 303(d) list. Under the 2004/2006 303(d) list, the only parameter is temperature from September 1 through June 30 for salmonid spawning (ODEQ, 2006). The water quality limited segment includes the Deschutes River up to the Reregulating Dam within this HUC 5 boundary. The

crossing location is at the Reregulating Reservoir, which already experiences significant water level change and temperature change due to seasonal storage and withdrawals. The watershed is known to have a variety of streambank conditions ranging from a deep, narrow valley with rimrock along the Deschutes River to channel instability along Deschutes tributaries (DBCG, 2004). Land use practices (including road crossings) have reduced habitat complexity and riparian areas impacting the floodplain.

Snowmelt creates flashy flows within the watershed (DBCG, 2004). The turbidity created from the unstable channel banks and land use practices are amplified by these flashy flows. However, with implementation of erosion control and streambank stabilization measures during construction, the proposed project is not likely to affect watershed turbidity levels. The presence of LWD, pools, and off-channel habitat have been greatly diminished from the watershed's historical levels due to land use practices and man-made barriers including the Pelton Round Butte Complex (DBCG, 2004 and NWPCC, 2004)). Placement of additional LWD in the Shitike Creek as part of the proposed project's conservation measures could increase the overall amount of LWD available as in-stream habitat in the watershed.

The Mill Creek-Warm Springs River watershed does have water quality issues with temperature. Portions of Mill Creek were placed on the 303(d) list due to temperature (DBCG, 2004). Timber removal and vegetation clearing could temporarily increase temperature at the waterbody crossing site until streambanks are revegetated, but will not be expected to affect water temperature at a larger scale (see discussion on temperature in the Water Quality section above). Upper portions of Mill Creek are still recovering from the Hash Rock forest fire, which also limits riparian recruitment downstream. Mill Creek has poor streambank conditions including channel bank stability and lack of riparian areas; however, restoration projects are present within the watershed to aid in the return of LWD along with riparian plantings (DBCG, 2004). With implementation of erosion control and streambank stabilization measures during construction, the proposed project is not likely to affect watershed turbidity levels. Also, placement of additional LWD in the stream as part of the proposed project's conservation measures could increase the overall amount of LWD available as in-stream habitat in the watershed.

The Warm Springs River watershed has portions of streams with temperatures exceeding 70°F in mid-to-late summer. Timber removal and vegetation clearing could temporarily increase temperature at the waterbody crossing sites until streambanks are revegetated, but will not be expected to affect water temperature at a larger scale (see discussion on temperature in the Water Quality section above). The Warm Springs River drainages have suffered small to moderate loss of riparian vegetation and overall floodplain connectivity (DBCG, 2004). Streams in the watershed are known to have fairly stable streambank conditions; however, flashy flows from snowmelt have accelerated floodplain scouring and removal of LWD reducing the number of pools within the watershed. The few remaining pools exist in the upper reaches of streams (DBCG, 2004). Placement of additional LWD in the streams as part of the proposed project's conservation measures could increase the overall amount of LWD available as in-stream habitat in the watershed.

2.4 Compensatory Mitigation

Adverse impacts on MCR steelhead may not be completely preventable through avoidance and minimization measures incorporated into the proposed action by PGT (e.g., construction timing, isolating work areas, fish salvage, revegetation). PGT proposes compensatory mitigation actions to offset unavoidable, adverse impacts that the Warm Springs Alternative would have on these species. Mitigation would include road decommissioning, side channel habitat restoration, LWD placement, and riparian restoration. A description of the compensatory mitigation actions proposed for the Warm Springs Alternative is provided in the response to number 9E of the February 12, 2010 data request.

2.5 Cumulative Effects

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA. There are no known state, tribal, local or private actions that are reasonably certain to occur in the action area for the Warm Springs Alternative.

Additional References Cited

Oregon Department of Environmental Quality (ODEQ). 2006. Water Quality Assessment Database. Available online at http://www.deq.state.or.us/wq/assessment/rpt0406/results.asp. Accessed February 2010.

Deschutes Basin Coordinating Group (DBCG). 2004. Deschutes Subbasin Plan. Redmond, Oregon.

Northwest Power and Conservation Council (NWPCC). 2004. Supplement Deschutes Subbasin Management Plan. Available online at http://www.nwcouncil.org/fw/subbasinplanning/deschutes/plan/Supplement.pdf. Accessed February 2010.

ATTACHMENT 9A-1

ATTACHMENT 9A-1
Palomar Gas Transmission Project
Waterbodies Crossed by the Maupin Waterline Alternative Pipeline Route
March 1, 2010

Waterbody[1]	County	Project Tract No.	Unique ID	Begin MP	Survey Date	Section Township Range	1/4, 1/4 Section	Longitude (DD.DDDD)	Latitude (DD.DDDD)	County Tax Lot ID	Sub-Basin	5th Level Watershed Name	5th Level Watershed Number	River Mile	Approx. Elevation (feet)	FEMA 100-year Floodplain	Flow*	Approx. Temp. Acreage Impacted [3]	Approx. top of bank to top of bank (feet)*	Approx. OHWM (feet)*	Approx. Water Depth (feet)*	Approx. Water Velocity (fps) *	Discharge ft³/sec [2]	Scour Hazard [4]	Substrate*	Unique Features*	Soil Map Unit Symbol	Adjacent Riparian Vegetation*	Invasive Species*	Adjacent Riparian Forest*	Adjacent Wetlands	Field Remarks	Associated Habitats*	Associated Species*	(Draft) Proposed Crossing Method [5]	Figure Number	ODF Beneficial Use Class.	303(d) Listed	National River Inventory	In-water Work Window	Resident Fish Present	Anadro-mous Rearing	Anadro-mous Spawn-ing	Fed. ESA Status	Desig-nated Critical Habitat	Oregon Essential Salmonid Habitat	Distance to nearest anadromous salmon presence (miles)	Waterbody Sensitivity Assessment
PRIVATE LAND																																																	
Deep Creek	Wasco	20000	1159	1.3		T 7 S, R 15 E, Sec. 21	SE 1/4, NW 1/4	-120.939878	44.941559	7S 15E 0 1500	Lower Deschutes	Bakeoven Creek	1707030608		3121.2									TBD							No[6]					Wet Open cut	1.2.3-5				7/1-10/31								2.28	TBD
Tributary to Deep Creek	Wasco	20010	WS-SW8M	2.4	8/31/2009	T 7 S, R15 E, Sec. 20	SE 1/4, NE 1/4	-120.961189	44.941932	7S 15E 0 2101	Lower Deschutes	Bakeoven Creek	1707030608		3189.1		E	0.01	9	6	0	0	Low	GR, CO		BcC	sagebrush, cheatgrass, bitterbrush, commea, juniper	cheatgrass	No		N/A			Wet Open cut	1.2.3-5		Unknown		7/1-10/31								2.24	Low
Boardtree Canyon	Wasco	20080	1163	6.5		T 7 S, R 14 E, Sec 1	NW 1/4, SE 1/4	-120.993569	44.991784	7S 14E 0 100	Lower Deschutes	Bakeoven Creek	1707030608		3276.9									TBD							No[6]					Wet Open cut	1.2.3-5				7/1-10/31								2.67	TBD
White Door Canyon	Wasco	20100	1167	7.4		T 6 S, R 15 E, Sec. 31	SW 1/4, NW 1/4	-120.990876	45.005902	6S 15E 0 1800	Lower Deschutes	Bakeoven Creek	1707030608		3157.9									TBD							No[6]					Wet Open cut	1.2.3-5				7/1-10/31								2.38	TBD
Unnamed	Wasco	20140	WS-SW2M	11.5	8/25/2009	T 6 S, R 14 E, Sec. 11	SE 1/4, SW 1/4	-121.017109	45.054849	6S 14E 0 100	Lower Deschutes	Bakeoven Creek	1707030608		3035.3		E	0.01	14	6	0	0	Medium	SI, CL, SA, GR, CO		BcC	cheatgrass, squirreltail, bitterbrush, rabbitbrush, dwarf sagebrush	cheatgrass	No		culvert present at road crossing, erosion present	Loggerhead Shrike and Western Bluebird		Wet Open cut	1.2.3-5		Unknown		7/1-10/31								3.01	Medium
Unnamed	Wasco	20192	WS-SW3M	13.8	8/24/2009	T 5 S, R 14 E, Sec. 35	SW 1/4, SE 1/4	-121.026376	45.086571	5S 14E 0 1600	Lower Deschutes	Bakeoven Creek	1707030608		2634.4		E	0.01	6	5.5	0	0	Low	SI, CL, SA, GR, CO		BcC	bluebunch wheatgrass, cheatgrass, rabbitbrush, sagebrush, juniper	cheatgrass	No		culvert present at road crossing, erosion present	Loggerhead Shrike and Western Bluebird		Wet Open cut	1.2.3-5		Unknown		7/1-10/31								3.59	Medium (blasting likely)
Unnamed	Wasco	20200	WS-SW4M	14.3	8/24/2009	T 5 S, R 14 E, Sec. 35	NW 1/4, SW 1/4	-121.029167	45.093651	5S 14E 0 400	Lower Deschutes	Bakeoven Creek	1707030608		2541.4		E	0.01	3.5	5	0	0	Low	SI, CL, SA, GR, CO		BcC	cheatgrass, bluebunch wheatgrass, sagebrush, rabbitbrush	cheatgrass	No		culvert present at road crossing, erosion present	Loggerhead Shrike and Western Bluebird		Wet Open cut	1.2.3-5		Unknown		7/1-10/31								3.26	Medium (blasting likely)
Unnamed	Wasco	20200	WS-SW5M	14.6	8/24/2009	T 5 S, R 14 E, Sec. 34	NE 1/4, NE 1/4	-121.033860	45.09740903	5S 14E 0 400	Lower Deschutes	Bakeoven Creek	1707030608		2462.9		E	0.01	5	4	0	0	Low	SI, CL, SA, GR, CO		BcC	cheatgrass, rabbitbrush, sagebrush, bluebunch wheatgrass, yarrow	cheatgrass	No		culvert present at road crossing	Loggerhead Shrike and Western Bluebird		Wet Open cut	1.2.3-5		Unknown		7/1-10/31								2.77	Medium (blasting likely)
Tributary to Stag Canyon	Wasco	20200	WS-SW6M	15.3	8/24/2009	T 5 S, R 14 E, Sec. 27	SE 1/4, NE 1,4	-121.038512	45.105261	5S 14E 0 400	Lower Deschutes	Middle Deschutes	1707030607		2326.4		E	0.01	7.5	5	0	0	Low	SI, CL, SA, GR, CO	GB	BaC and BcC	cheatgrass, rabbitbrush, bluebunch wheatgrass, yarrow	cheatgrass	No		erosion present	Loggerhead Shrike and Western Bluebird		Wet Open cut	1.2.3-5		Unknown		7/1-10/31								1.95	Low
Tributary to Stag Canyon	Wasco	20200	WS-SW7M	15.5	8/24/2009	T 5 S, R 14 E, Sec. 27	NE 1/4, SW 1/4	-121.040087	45.107484	5S 14E 0 400	Lower Deschutes	Middle Deschutes	1707030607		2269.4		E	0.01	3.5	3	0	0	Low	SI, CL, SA, GR, CO		BaC	cheatgrass, bluebunch wheatgrass, rabbitbrush, yarrow	cheatgrass	No		erosion present	Loggerhead Shrike and Western Bluebird		Wet Open cut	1.2.3-5		Unknown		7/1-10/31								1.78	Low
Unnamed	Wasco	20200	WS-SW1M	19.4	8/21/2009	T 5 S, R 14 E, Sec. 4	SW 1/4, SW 1/4	-121.071595	45.158281	5S 14E 0 400	Lower Deschutes	Middle Deschutes	1707030607		1352.0		E	0.00	5	3	0	0	Low	SI, SA, GR, CO, BO, BD		BcC	western juniper, cheatgrass, bluebunch wheatgrass, squirreltail, rabbitbrush	cheatgrass	No		stream only covers the western 2/3 of corridor	Loggerhead Shrike and Western Bluebird		Wet Open cut	1.2.3-5		Unknown		7/1-10/31								0.27	Medium (blasting likely)
Deschutes River	Wasco	23140	57	20.3		T 5 S, R 14 E, Sec. 5	NE 1/4, NW 1/4	-121.081827	45.170698	5S 14E 5 AB 100	Lower Deschutes	Middle Deschutes	1707030607	51.8	836.8	X	P						High			W			Yes[6]	WS-WL1M				Aerial Span: Bridge	TBD	F	pH, temp	S, R, G, F	2/1-3/15	Y	ST	ST		yes		0	High
Deschutes River (side channel)	Wasco	23140	WS-SW9M	20.4	11/12/2009	T 5 S, R 14 E, Sec. 5	NE 1/4, NW 1/4	-121.082043	45.17096473	5S 14E 5 100	Lower Deschutes	Middle Deschutes	1707030607	51.8	841.1	X	P	0.08	50	35	3	2	Medium	GR, CO, BO	GB, RI	40E	rubus armeniacus, alnus rubra, phalarius arundmacea		Yes	WS-WL1M	steep side slopes, railroad bed north side. Channel straddles tract boundary between RR-20323 and WS-23140			Aerial Span: Bridge	TBD	F	pH, temp	S, R, G, F	2/1-3/15	Y	ST	ST		yes		0	High
																	Total Acreage:	0.15																																	

* Data were all taken on the date of survey shown in table.

= no survey access

[1] Waterbodies not yet field surveyed are represented by ODF's StreamNet Data.

[2] USGS Data: Based on yearly averages from available data.

[3] StreamNet waterbodies were not caluclated for acreage impacts.

[4] Scour hazard analysis was completed by Golder and Associates.

[5] Proposed Crossing Method column identifies anticipated crossing method. PGT will use conventional upland crossing techniques if a waterbody is dry at the time of crossing.

[6] Results are based on aerial photo review.

[7] Preliminary - proposed method pending field review.

Cells in the table that are blank indicate no information is available.

Distance to nearest anadromous salmon presence:

The distance to the nearest salmon presence was estimated by measuring, on a GIS topographical map, the distance between the waterbody crossing and the nearest documented salmon presence (based on GIS data available from StreamNet).

ODF Beneficial Use Classification:
F: Fish
Unknown: Not yet assigned

Substrate Data Key:
SI: Silt
CL: Clay
SA: Sand
GR: Gravel
CO: Cobble
BO: Boulders
BD: Bedrock
SL: Slate

Fish Presence Key:
CHF: chinook, fall
CHS: chinook, summer
CO: coho
STS: steelhead, summer
STW: steelhead, winter
BUT: bull trout

National River Inventory:
S: Scenic
R: Recreational
G: Geology
F: Fishery

Unique Features Key:
PO: Pools
RI: Riffles
LWD: Large Woody Debris
GB: Gravel Bars/Islands
ER: Erosion
RO: Rock Outcrop

Scour Hazard Classification:

LOW –Small sized streams and channels, little evidence of erosion or disturbance, significant vegetation stabilizing channels, typically intermittent or ephemeral channels.

MEDIUM – medium to small sized active river and stream crossings, evidence of lateral erosion and potential for vertical scour, channel more defined and/or limited floodplain complexity, typically perennial and/or intermittent channels.

HIGH – large to small sized, dynamic river and stream crossings, evidence of lateral erosion and/or vertical scour issues, complex channel and floodplain areas, active floodplain areas, typically perennial and/or intermittent channels.

ATTACHMENT 9A-1
APPENDIX R *Revised March 2010*

Palomar Gas Transmission Project
Salmonid ESU-DPS

Waterbody Crossing Name/Unique ID	5th Field Watershed	MP	Coordinates	Scour Hazard	Designated Critical Habitat	Riparian Forest Habitat Affected (acres)	Affected ESUs/DPSs Crossing Method, Distance to fish presence (miles)		Affected Population
							Bull Trout	MCR Steelhead	
Deschutes River- 57	Middle Deschutes	20.3	45.171 - 121.082	High	present	0.14	Aerial- 0.00	Aerial- 0.00	Deschutes Population (bull trout) Deschutes River West Population (MCR)
Deschutes River Side Channel-WS-SW9M	Middle Deschutes	20.4	45.171 - 121.082	Medium	present	0.22	Aerial- 0.00	Aerial- 0.00	Deschutes Population (bull trout) Deschutes River West Population (MCR)

Crossing Type			Population	Crossings
Aerial (bridge)	2	2	Deschutes River	2
Total Crossings	2	2	Deschutes River West	2
Riparian Habitat Affected (acres)	0.36	0.36	0.36	

* No waterbodies with known salmonid presence are proposed for wet open cut crossings. The WOC crossings shown are those that are 0.25 miles or less from know salmonid presence.

n/a = not available

Palomar Gas Transmission Project – Waterbody Survey
Waterbody ID: WS-SW8M

Photo Direction:	Description/Notes:
North	View of ephemeral stream channel.

Photo Direction:	Description/Notes:
East	View of eroded streambank.

Photo Direction:	Description/Notes:
West	View of adjacent vegetation.

Photo Direction:	Description/Notes:
N/A	View of ephemeral channel substrate.

Palomar Gas Transmission Project – Waterbody Survey
Waterbody ID: WS-SW2M

Photo Direction:	Description/Notes:
West	Upstream view of channel and Highway 197.

Photo Direction:	Description/Notes:
East	Downstream view of ephemeral channel.

Photo Direction:	Description/Notes:
South	View of bank incision and vegetation.

Photo Direction:	Description/Notes:
N/A	Channel substrate.

Palomar Gas Transmission Project – Waterbody Survey
Waterbody ID: WS-SW3M

Photo Direction:	Description/Notes:
East	View of upstream ephemeral channel.

Photo Direction:	Description/Notes:
West	View of downstream ephemeral channel.

Photo Direction:	Description/Notes:
N/A	Channel substrate.

Photo Direction:	Description/Notes:
South	View of bank vegetation.

Palomar Gas Transmission Project – Waterbody Survey
Waterbody ID: WS-SW4M

Photo Direction:	Description/Notes:
East	View of downstream ephemeral channel.

Photo Direction:	Description/Notes:
N/A	View of channel substrate.

Photo Direction:	Description/Notes:
South	View of bank vegetation.

Photo Direction:	Description/Notes:
West	View of upstream ephemeral channel.

Palomar Gas Transmission Project – Waterbody Survey
Waterbody ID: WS-SW5M

Photo Direction:	Description/Notes:
East	View of downstream ephemeral channel.

Photo Direction:	Description/Notes:
N/A	Channel substrate.

Photo Direction:	Description/Notes:
South	Bank vegetation.

Photo Direction:	Description/Notes:
West	View of upstream ephemeral channel.

Palomar Gas Transmission Project – Waterbody Survey
Waterbody ID: WS-SW6M

Photo Direction:	Description/Notes:
East	Upstream view of ephemeral channel.

Photo Direction:	Description/Notes:
N/A	Channel substrate.

Photo Direction:	Description/Notes:
South	Bank vegetation.

Photo Direction:	Description/Notes:
West	Downstream view of channel.

Palomar Gas Transmission Project – Waterbody Survey
Waterbody ID: WS-SW7M

Photo Direction:	Description/Notes:
West	View of downstream ephemeral channel.

Photo Direction:	Description/Notes:
N/A	Channel substrate.

Photo Direction:	Description/Notes:
East	View of upstream ephemeral channel.

Photo Direction:	Description/Notes:
West	View of adjacent landscape.