Attachments: 230 kV transmission line study (modified per FERC comments) 6-28-07.doc

From: David Turner [mailto:David.Turner@ferc.gov]
Sent: Tuesday, July 03, 2007 9:48 AM
To: Shane Bickford
Subject: RE: Updated 230 kV transmission line study plan

Shane,

I have provided comments and suggested revisions in the attached study plan. I used Word's comment feature to insert the comments. Most are editorial and organization in character.

I have one concern about the statement regarding the movement pathways for waterfowl from Rocky Reach. The sentence seems to suggest that Rocky Reach birds are vulnerable to collision with the project transmission line, but not birds originating from the Wells reservoir. While this may be true, the issue is whether the Well's transmission line represents a collision hazard to waterfowl, irrespective of the reservoir they may be flying to or from. If my interpretation of the statement is true, does this affect the number of areas that are likely to represent a collision hazard and the amount of area that needs to be surveyed?

David Turner
202-502-6091

PLANT AND WILDLIFE SURVEYS AND COVER TYPE MAPPING FOR THE WELLS HYDROELECTRIC PROJECT 230 kV TRANSMISSION CORRIDOR (Transmission Line Wildlife and Botanical Study)

WELLS HYDROELECTRIC PROJECT

FERC NO. 2149

June 2007

Prepared by:
Public Utility District No. 1 of Douglas County
East Wenatchee, Washington

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ABSTRACT:

The current Wells Hydroelectric Project (Wells Project) license will expire on May 31, 2012. Public Utility District No. 1 of Douglas County (Douglas PUD) owns and operates the Wells Project and is using the Integrated Licensing Process (ILP) for relicensing as promulgated by Federal Energy Regulatory Commission (FERC) regulations issued July 23, 2003 (18 CFR Part 5). A Terrestrial Resource Work Group (RWG), which is composed of stakeholders and Douglas PUD staff, was formed for the purposes of identifying issues and information gaps that may require study during the relicensing of the Wells Hydroelectric Project. The Terrestrial RWG, through a series of technical meetings, has identified the need for a study to assess the effects of the Project's 230 kV transmission line corridor on wildlife.

This proposed study is intended to fill the gaps in local knowledge of botanical resources, including rare, threatened and endangered (RTE) plants, invasive plant species, and vegetation communities within the 235-foot Wells Project 230 kV transmission line corridor. The study will also provide bird species presence, identify if bird collision with the line and structures is a potential problem, and provide information on the extent of use and dependency on the transmission corridor by sage grouse (*Centrocercus urophasianus)* and sharp-tailed grouse (*Tympanuchus phasianellus*), both RTE species. A literature review will be conducted to identify potential effects of the 230 Kv transmission lines and towers on raptors and prairie grouse. Surveys will also be conducted for RTE mammals and reptiles. The study plan outlines methods that will be used to collect information on these plants and animals.

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1.0 INTRODUCTION

1.1 General Description of the Wells Hydroelectric Project

The Wells Hydroelectric Project (Wells Project) is located at river mile (RM) 515.8 on the Columbia River in the State of Washington. Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (COE), and 42 miles upstream from the Rocky Reach Hydroelectric Project, owned, and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, which is located approximately 8 miles upstream from the Wells Dam.

The Wells Project is the chief generating resource for Public Utility District No. 1 of Douglas County (Douglas PUD). It includes ten generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides the hydrocombine, which is 1,130 feet long, 168 feet wide, with a crest elevation of 795 feet in height.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The normal maximum surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre feet at elevation of 781. The normal maximum water surface elevation of the reservoir is 781 feet (Figure 1.1-1).

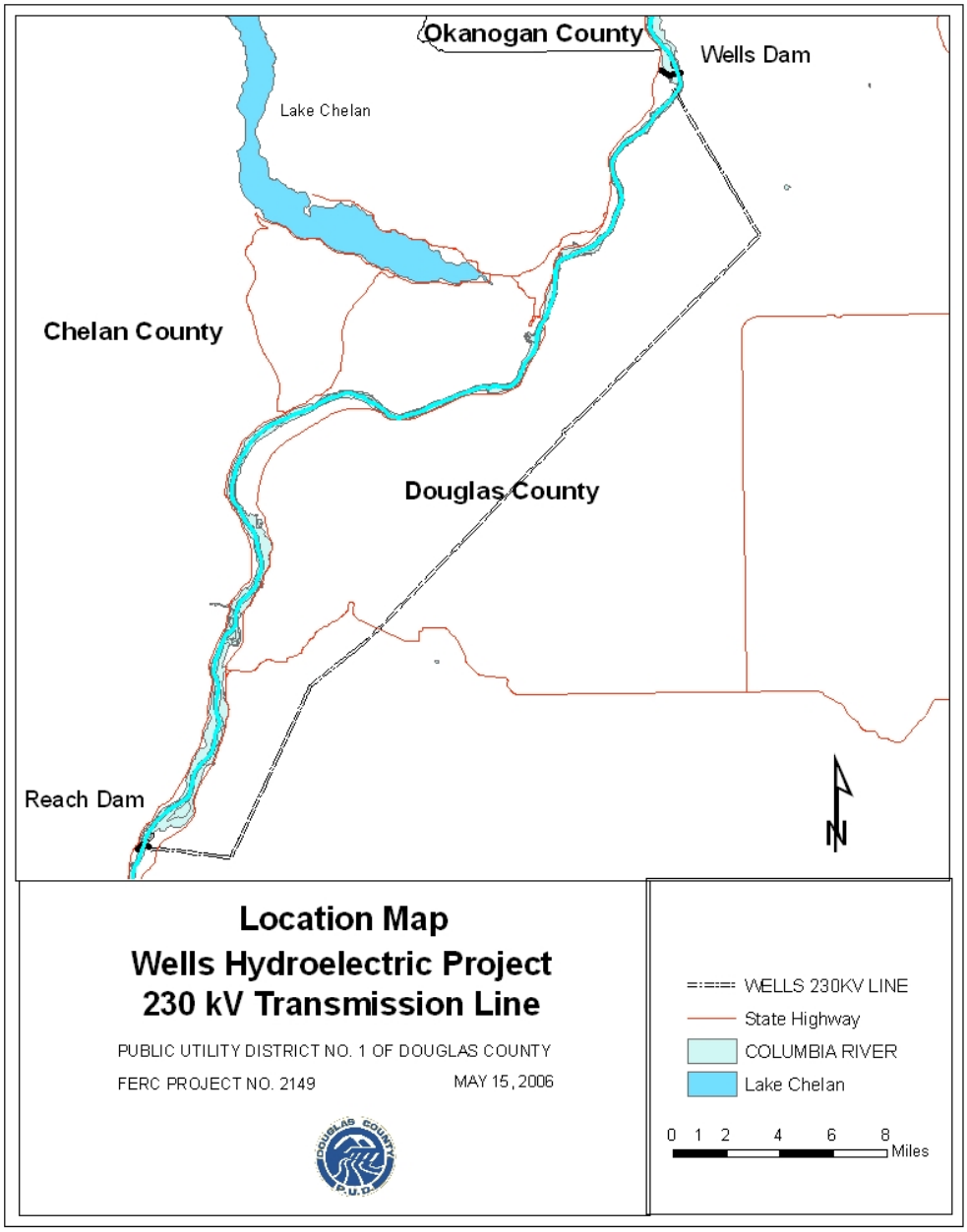

Figure 1.1-1 Location Map – Wells Dam 230 kV Transmission Line Corridor

1.2 Relicensing Process

The current Wells Project license will expire on May 31, 2012. Douglas PUD is using the Integrated Licensing Process (ILP) as promulgated by FERC regulations issued July 23, 2003 (18 CFR Part 5). Various state and federal agencies, tribes, local governments, non-governmental organizations and the general public will participate in the Wells Project ILP. During the ILP, information needs related to the relicensing of the Wells Project will be identified. All study plans intended to meet these information needs will be prepared in a manner that addresses each of the required seven FERC criteria described in 18 CFR § 5.9(b).

18 CFR § 5.9(b) Content of study request. Any information or study request must:

(1) Describe the goals and objectives of each study and the information to be obtained;
(2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;
(3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;
(4) Describe existing information concerning the subject of the study proposal, and the need for additional information;
(5) Explain any nexus between project operation and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements;
(6) Explain how any proposed study methodology is consistent with generally accepted practices in the scientific community or, as appropriate, considers relevant tribal values and knowledge. This includes any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration;
(7) Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.

All study plans submitted to FERC will be reviewed by Douglas PUD and the applicable Resource Work Group(s) to determine if studies proposed will fill the information needs related to the Wells Project Relicensing. Any dispute over alternative study methods, that cannot be reconciled with stakeholders, will be decided by FERC.

2.0 GOALS AND OBJECTIVES

The overall goal of the wildlife and botanical surveys along the Project transmission lines is to provide information needed to guide land management decisions, avoid damage to valuable habitat during future transmission corridor management activities and minimize the spread of invasive weeds. The study will provide baseline data on birds found near the corridor and information on the presence of rare, threatened and endangered (RTE) plant or animal species in the corridor. In addition, this study will provide information needed to meet the FERC requirements during the Wells ILP. The study objectives are divided into botanical and wildlife resource categories.

Pursuant to CFR 18.5(vii), RTE species in this study plan include:

- Federally listed as threatened, endangered, proposed or candidates under the ESA;
- State listed as threatened or endangered;
- State listed as candidate (wildlife only);
- State listed as sensitive (plants only); or
- State listed as Review List 1 (plants only).

2.1 Botanical Resources

The main objectives of the botanical study are:

(1) Identify and document the location of RTE plant species that occur within the transmission line corridor.

(2) Identify and classify the specific vegetation cover types in the study area.

(3) Generate detailed information on the species composition and classification of these plant communities and their structures.

(4) Create a detailed Geographic Information System (GIS) cover type map of the study area showing the locations of these plant communities, their distribution, areas of coverage (acres), and note locations of habitats of special concern or unique areas observed.

(5) Identify any invasive plant species in the transmission corridor. For this transmission line corridor study, invasive species are Washington State Class A and B-designate noxious weeds.

2.2 Wildlife Resources

2.2.1 Avian

The main objectives of the avian study are:

(1) Identify and document the location of any federal and state RTE avian species that use the study area.

(2) Describe the habitat features used by RTE avian species observed within the corridor.

(3) Document the presence of other avian species and provide relative abundance for birds using the study area.

(4) Document raptor and corvid nesting and sharp-tailed and sage grouse use within the study area.

(5) Document any evidence under the transmission line of avian collisions.

2.2.2 Mammal

The main objectives of the mammal study are:

(1) Identify and document the location of federal and state RTE mammal species that use the study area.

(2) Describe the habitat features used by RTE mammals observed within the corridor.

(3) Document the presence of other mammal species in the study area.

2.2.3 Reptile

The main objectives of the reptile study are:

(1) Identify and document the location of federal and state RTE reptile species that use the study area.

(2) Describe the habitat features used by RTE reptiles observed within the corridor.

(3) Document the presence of other reptile species in the study area.

3.0 STUDY AREA

Two 230 kV transmission lines connect Wells Dam with the Douglas switchyard next to Rocky Reach Dam (Figure 1.1-1). The transmission lines occupy a 235-foot corridor that is 41 miles long. The transmission lines begin at Wells Dam, cross the Columbia River from Carpenter Island in Chelan County to Douglas County. The transmission lines travel southeast to the Boulder Park area then turn southwest across wheat fields, past the town of Waterville and over Badger Mountain. The lines descend the west slope of Badger Mountain and end at Douglas Switchyard. The study area is the 235-foot transmission line corridor, excluding all actively cultivated fields.

4.0 BACKGROUND AND EXISTING INFORMATION

4.1 Botanical Resources

The US Fish and Wildlife Service (FWS) maintains a list of all plants that are listed or proposed as threatened or endangered under the Endangered Species Act. In addition to the federal list, Washington Department of Natural Resource's Natural Heritage Program (WNHP) maintains a database on the known locations of federally listed and proposed, as well as state listed threatened, endangered, sensitive and Review List 1 plants in Washington. Historic rare plant information is also available at both Washington State University and University of Washington.

Invasive plant species potentially occurring in the study transmission line corridor are available from the Washington State Weed Board and Washington State Extension Service.

4.2 Wildlife Resources

The FWS maintains a list of all wildlife listed or proposed as threatened or endangered under the Endangered Species Act. The Washington Department of Fish and Wildlife (WDFW) maintains a list of all wildlife species listed or proposed for listing under the WAC-232-12-297. WDFW also maintains a list of RTE species and a database with locations of all recorded sightings. Cassidy et.al. (1997) also provides species range information for all wildlife that may be found in the transmission line corridor.

4.3 Transmission Corridor Maintenance

Douglas PUD conducts an ongoing maintenance program on the 230 kV transmission corridor. Maintenance activities include noxious weed control at transmission corridor structures and along access roads in the spring and fall. Target weed species are primarily diffuse knapweed (*Centaurea diffusa*) and Dalmatian toadflax (*Linaria dalmatica*). Transline® herbicide is applied in the spring as a contact herbicide with a limited residual and is also used for spot applications in the fall. Transline® is used because it has minimal impacts on native grass species and sagebrush shrub species. Douglas PUD releases the biological control insect *Calophasia lunula* to control Dalmatian toadflax. Weedar-64® and Curtail® are also used to control broadleaf weeds.

The maintenance program also includes an overall inspection for damaged roads or structures. Tower structures are inspected on foot or using a four-wheeled all terrain vehicles (ATV) with low pressure tires. At the request of land owners, maintenance roads were not constructed across approximately 25 miles of wheat fields, on the Waterville Plateau, when the transmission lines were built. Existing roads require periodic maintenance if there is damage to the road from storms or rock falls or if the road requires grading for repairs to the 230 kV lines.

4.4 Terrestrial Resource Work Group

As part of the preparation for the relicensing of the Wells Project, Douglas PUD established a Terrestrial Resource Work Group (RWG) which began meeting informally in November, 2005. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to collaboratively identify potential resource issues related to Project operations and relevant to relicensing, and to develop preliminary study plans to be included in the Wells Pre-Application Document (PAD).

Through a series of meetings, the Terrestrial RWG collaboratively developed a list of Issue Statements, Issue Determination Statements and Agreed Upon Study Plans. An Issue Statement is an agreed upon definition of a resource issue raised by a stakeholder. An Issue Determination Statement reflects the RWG's efforts to review the existing project information and to determine whether an issue matches with FERC's seven criteria and would be useful in making future

relicensing decisions. Agreed Upon Study Plans are the finished products of the informal RWG process.

Based upon these meetings and discussions, the Terrestrial RWG is proposing to conduct a study to collect baseline botanical information for the existing 230 kV transmission line running from Wells Dam to Douglas Switchyard.

This proposed study is intended to fill data gaps in local knowledge of botanical resources including RTE and invasive plant species. This study will also provide information on bird species presence, identify if bird collision is a problem and provide information on the possible use of the transmission corridor by sharp-tailed or sage grouse. The study will also provide information on Washington ground squirrel and striped whipsnake which are both RTE species, which have ranges that overlaps with the study area.

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Electrocution of birds using the 230 kV line for perch and nest sites does not need additional data of analysis of potential project effects. Insulators suspend each conductor eight or more feet from each lattice tower structure and approximately 24 feet between phases. The 230 kV transmission line exceeds the phase to phase and phase to ground separation of 60 inches recommended by the Avian Power Line Interaction Committee (APLIC) (2006) for the protection of raptors found in the vicinity of the transmission line corridor.

Comment [DT1]: SD2 identifies electrocution as an issue, so it will need to be addressed. That said, you can still conclude that no additional study is needed for the reasons cited.

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4.5 Issue Statements

Issue Statement (PAD Section 6.2.3.2)

Presence of the transmission lines could kill or injure birds and the presence of the transmission towers could affect wildlife behavior and use of adjacent habitat.

Issue Determination Statement (PAD Section 6.2.3.2)

The Wells Project license includes two 230 kV single-circuit transmission lines. The lines run 41 miles in length from the switchyard at Wells Dam to the Douglas Switchyard operated by Douglas PUD. The lines run parallel to each other on 45-85 foot steel towers along a common 235-foot wide corridor.

The transmission lines and towers could have impacts on wildlife, including bird collisions and raptor nesting. Baseline studies have not been completed to assess these potential impacts. Wildlife and botanical species inventories have not been completed along the transmission corridor.

The RWG agrees that a study is needed during the two-year ILP study period and is proposing to complete baseline wildlife and RTE inventories along the transmission corridor. In addition to documenting baseline conditions, this study would be used to document presence (whether raptors, corvids and prairie grouse are found within or adjacent to the transmission corridor). A literature review will also be completed to specifically identify potential effects on raptors and prairie grouse.

Issue Statement (PAD Section 6.2.3.3)

Maintenance of the transmission corridor could affect wildlife and/or botanical species (e.g. weed control and road maintenance).

Issue Determination Statement (PAD Section 6.2.3.3)

The Wells Project license includes two 230 kV single-circuit transmission lines. The lines run 41 miles in length from the switchyard at Wells Dam to the Douglas Switchyard operated by Douglas PUD. The lines run parallel to each other on 45-85 foot steel towers along a common 235-foot wide corridor.

Maintenance activities along the transmission corridor could have an impact on wildlife and botanical resources. Wildlife and botanical species inventories have not been completed along the transmission corridor.

The resource work group agrees that a study is needed during the two-year ILP study period and is proposing to complete baseline wildlife, botanical and RTE inventories along the transmission corridor.

There is some existing information on botanical and avian resources in the study area as described below.

5.0 PROJECT NEXUS

The two Wells 230 kV transmission lines were included in the FERC order issuing the Wells Project license (issued: July 12, 1962). Exhibit K maps of the transmission line corridor transmitted copies of as build Exhibits J and K showing the route of the transmission line of the Wells Project 2149. FERC approved the Exhibit J and K drawings and amended the license by order (issued: January 5, 1979).

The results of the RTE botanical and wildlife surveys will be used for Section 7 consultation under the ESA. Direct effects of the transmission corridor and/or maintenance of the corridor on RTE species or habitats are unknown. Ongoing maintenance of the transmission corridor could adversely affect RTE plants or wildlife, if any are present. The avian and botanical surveys will also be used to help guide future corridor management activities and to determine whether additional measures are needed to reduce the spread of noxious weeds and bird collisions.

6.0 METHODOLOGY

The methods for conducting the botanical and terrestrial surveys described in the goals and objectives are each described below.

6.1 Botanical

6.1.1 RTE Plant Surveys

The surveys for RTE plants will comprise the following tasks: (1) pre-field review; (2) field surveys; and (3) documentation and mapping of results. Each task is described below.

The pre-field review task consists of developing a "target" list of RTE plant species to guide field surveys. The pre-field review task will be initiated by sending letters to the FWS and WNHP requesting the latest information on RTE plant species known to occur or potentially occurring in or near the Wells Project area. The target list of RTE species potentially occurring in the Wells Project area will be developed based on input from the FWS and WNHP. Information on habitat requirements, such as elevation, soils, and associated vegetation community, will be used to refine the list to those species most likely to be found in or near the Project area. This information will also be used to identify the habitats to be surveyed, with an emphasis on those that support RTE species with federal or state status as threatened or endangered. Botanists from the WNHP will also be asked for any additional information related to RTE species that may occur in the area.

Prior to beginning field surveys, project botanists will review the morphological characteristics of target RTE plant species to develop a search image, which improves detection and recognition abilities. This process will include reviewing herbarium specimens and collecting information on vegetative, floral, and fruit characteristics for each target species and other species that are closely related or otherwise difficult to distinguish from the target RTE species.

Surveys for RTE plants in the transmission line corridor will involve visually searching suitable habitat. RTE plant surveys will be conducted on foot using a random meander approach described in Nelson (1985). Surveys will be conducted by botanists experienced in conducting RTE plant surveys.

The habitat requirements of RTE species will be used to refine survey efforts. Habitats with a high probability of supporting one or more RTE plants will receive thorough coverage. Habitats with a lower likelihood of supporting these species will be surveyed less intensively. Actively cultivated fields will not be surveyed. RTE species will be recorded and mapped when encountered and habitats will be described.

The timing of RTE plant surveys is critical to the success and validity of the survey. The number of surveys to be conducted in 2008 will be determined by the blooming period of each RTE plant species. Surveys are expected to be conducted in early May, mid to late June and early August.

RTE plants will be identified in the field using the Flora of the Pacific Northwest (Hitchcock and Cronquist 1973) and the Field Guide to Selected Rare Plants of Washington (WNHP 2004). A variety of sources will be utilized to verify tentative species identification including other floras, published papers, herbarium specimens, and consultation with appropriate taxonomic specialists. A list of all plant species identified during field surveys will be compiled and provided in the final report.

WNHP sighting forms will be completed for each RTE plant population found in the transmission line corridor. Data collected will include population size and area, phenology, habitat, slope, aspect, elevation, soils, and associated species. Factors affecting survival of RTE species (e.g., deer browse, disturbance, etc.) will be noted if applicable. The population locations will be mapped on survey maps and Global Positioning System (GPS) coordinates will be collected to verify the mapped location. Photographs will be taken of the RTE plants and habitats where they are growing.
Population size for RTE species will be visually estimated (for large populations) or counted (for small populations). For large RTE plant populations (and with agency permission), a voucher specimen will be collected, pressed, and dried for deposition at the University of Washington Herbarium. Where collection poses a risk to the population, photographs will aid in verification by taxonomic specialists.

6.1.2 Invasive Species Surveys

The surveys for invasive plants will comprise the following tasks: (1) pre-field review; (2) field surveys; and (3) documentation and mapping of results. Each task is described below.

Invasive species surveys will be focused on plants listed in Washington State as Class A and Class B Designate weeds. Class A weeds are non-native species with a limited distribution in the state; eradication of all Class A weeds is required by state law. Class B weeds are non-native species whose distribution is limited to portions of Washington State and control requirements vary between counties. A list of weed species will be developed of all Class A and B weeds found in Douglas County. Prior to beginning field season surveys, botanists will review the morphological characteristics of Class A and B weeds to develop a search image, which improves detection and recognition abilities.

Surveys for invasive plant species will be conducted in the transmission line corridor. These surveys will be conducted in conjunction with RTE plant surveys and field verification of the Vegetation Cover Type Map. Since many invasive species are easiest to see and identify later in the growing season, these surveys will be conducted in the late June to early August time period. All class A or B species will be mapped.

Infestations of invasive species will be mapped on project maps and GPS coordinates will be collected to verify the mapped location. Each infestation will be mapped as accurately as possible, to a resolution of 0.1 acre. Data gathered for each infestation will include the estimated total number of plants and the aerial cover and density by cover by class, as developed by the North American Weed Management Association (NAWMA 2003): trace (T=<1%), low (L=1-5%), moderate (M=5.1-25%), and high (H=25.1-100%).

6.1.3 Cover Type Mapping

The vegetation mapping study will involve three phases of work. The first two phases will identify general cover types through photo interpretation and field verification. The third phase will be the production of the final cover type map.

Douglas PUD received digitized color aerial photography of Douglas County from Natural Resources Conservation Service. The color digital orthophotos have a pixel resolution of one meter. Using these digital orthophotos, general vegetation types will be delineated by heads-up digitizing in ArcView Geographic Information System (GIS). Vegetation types and land use classifications will also be assigned.

ArcView GIS will be used to generate field maps containing the color orthophotography and the cover type polygons. Preliminary maps of vegetation cover types will be verified in the field by a botanist. This work will be completed while conducting RTE and invasive plant surveys. Field verification will involve checking a subset of the boundaries of the cover type polygons and correcting the assigned cover type classification and reassigning correct classifications as needed. Corrections to the boundaries and cover type designations will be made directly on field copies of the maps.

Additional data will be collected during the field verification to describe the characteristics of each mapped cover type including species composition, stand structure, habitat quality and land use. Information collected will include:

- Plant species composition, including the dominate and more prominent associated species in each vegetation layer (tree, shrub and herbaceous layers);
- Structural data, including estimates of average heights and aerial cover of each vegetation layer;
- Predominant land use(s) associated with each cover type;
- Rare, unique and particularly high quality vegetation/habitat will be noted.

The contractor will use ArcView GIS to change any cover type polygons found to be in error during the field verification of the cover type map. The contractor will provide Douglas PUD with copies of all map products.

The contractor will be responsible for all equipment necessary to complete the field verification work.

6.2 Wildlife

Assessments to be conducted include avian point counts, prairie grouse surveys, and raptor and corvid nesting surveys. In addition, surveys will be conducted for reptiles and mammals. Incidental to all wildlife and botanical surveys, avian mortalities will be located, recorded and collected. Special emphasis will be made to documenting the presence of RTE species and their habitat during these surveys.

6.2.1 Avian Surveys

6.2.1.1 Point Counts

Avian surveys will be conducted to gather data on bird species that use various habitat types in the vicinity of the Wells Project 230 kV transmission line corridor. Surveys will be conducted four times from the first of May through the end of June, which is considered the peak of

breeding season in North Central Washington. Four fall surveys will be conducted from September to October to capture the variability of the fall avian migration.

Assessing avian use during the breeding season will involve the use of point count stations (Bibby et al. 1992, Ralph et al. 1995) and transects (Leukering et al. 2000, Altman and Bart 2001). Because of the high degree of ecological variability associated with "special species" which are those species that: (1) are in habitats that are not well monitored, (2) are too rare or erratic to be sampled effectively, or (3) have an ecology that is not conducive to standard methodologies (e.g., inconspicuous, colonial, nocturnal, low densities), Altman and Bart (2001) recommend using a combination of monitoring methods to gather occurrence and relative abundance data. Thus, a combination of point count stations and transects distributed throughout the study area will be sampled to maximize the probability of detecting the less common species as well as collecting adequate data on all species. This approach is termed a "point transect" (Altman and Bart 2001) and involves conducting standard 5-minute point count surveys at stations (Bibby et al. 1992, Ralph et al. 1995) and recording all detections of special species while walking routes between point count stations (Altman and Bart 2001). Point count stations will be a minimum of 820 ft (250 m) apart to avoid double-counting individual birds.

Avian surveys during the breeding season will take place between sunrise and 10:00 am (Altman and Bart 2001) and fall surveys will also start at sunrise and be completed by noon. Each bird detected via visual sighting or auditory call will be recorded, as well as the primary habitat type and the estimated distance from station center in 16 ft. (5 m) increments. All mammals or reptiles seen will also be recorded. Data will also be recorded to gather information on likely nesting or foraging behaviors or signs. Detections at point count stations will be divided into two time periods: 0-3 minutes and 3-5 minutes. For each detection made along survey transects, biologists will record species, number of individuals, habitat, and behavior. GPS will be used to document the point count and transect locations and to estimate the linear length of the transect survey. All biologists conducting the avian surveys will have expertise in auditory as well as visual identification of birds.

To provide a general description of the land surveyed, biologists will record habitat data at each survey station/transect. Habitat parameters will be estimated qualitatively and will include:

- Tree layer cover, height, and average diameter at breast height (DBH),
- Shrub layer height and cover,
- Herbaceous layer height and canopy cover,
- Snag and Large Woody Debris (LWD) abundance, and
- Dominant species.

Locations of avian survey stations and transects will be stratified based on: (1) study area zone, (2) vegetation cover type, and (3) adjacent land use immediately outside of the study area. The actual number of point-transects and point count stations will be determined following further review of aerial photography. However, based on study area size, it is anticipated that approximately 50-70 stations will be established along the point-transects, which will be distributed among the five study area zones in proportion to their relative land base and river length.

All data will be entered into and stored in a database. Analysis of avian data will involve calculation of species richness and species relative abundance (number per station per survey period) for each of the five habitats and for the five study area zones. Data collected during the walking and boat transect portions of the surveys will be analyzed independently from the point count stations. ArcView GIS will be used to develop report maps that display survey locations and significant findings.

6.2.1.2 Prairie Grouse Surveys

Field surveys will be conducted during two time periods (late winter after snow melts and in September). Grouse transects will be placed randomly within large continuous blocks of native habitat in the study area along the transmission line corridor. A biologist will walk the transect looking for evidence of sage grouse or sharp-tailed grouse. All evidence of grouse use will be recorded and feathers collected for verification. Geographic coordinates of the location of any grouse observations will be established with a GPS receiver and recorded for later mapping.

All data will be stored in a database and mapped using ArcVeiw GIS.

6.2.1.3 Raptor and Corvid Nest Surveys

The raptor and corvid nest surveys will be conducted along the length of the transmission line corridor. A helicopter will be used during the surveys to search the transmission line lattice towers and the surrounding large conifer and deciduous trees, within 1/4 mile, for nests. The helicopter will travel at a speed that allows the observer to scan each tower and all the likely trees. The helicopters will remain far enough away from the nest to prevent the adults from flushing. A biologist familiar with raptor and corvids nesting will accompany the pilot and conduct the nest surveys and record data. The survey will be conducted in late May.

6.2.1.4 Avian Collision Surveys

Douglas PUD developed a draft vegetation cover type map using digital air photos and ArcView™. With the aid of the cover type map, topographic maps, local knowledge of bird behavior, and biological and line-related factors influencing collision risk, Douglas PUD identified two areas where birds[1] have a higher probability of colliding with the transmission lines—the portion of the 230 kV transmission line near Cornehl Lake and where it crosses the Columbia River. Consequently, surveys for dead birds will be conducted from the Wells Fish Hatchery on the west side of the 230 Kv transmission line river crossing to the Columbia River

[1] Most of the 230 kV transmission line is oriented in a north to south direction. The orientation of the lines is therefore less conducive to waterfowl collision with the ground wires, conductors and towers, except where it is near Cornehl Lake and the Columbia River (See Figure 1.1-1). The most vulnerable raptors are young birds during their first migration in the fall. Fall migrating raptor use the North Cascades flyway, using the lift from thermal and wind caused updrafts ridges in Chelan County (Smith and Neal, 2007). Few raptors migrate through Douglas County and thus the orientation of the 230 kV transmission line presents little hazard.

Comment [DT2]: Most of the new information serves more as analysis than a description of the survey methods. Thus, it would fit better in the issue descriptions to set the stage for the scope of the study. Focus here on what you are going to do and where.

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and for one half mile on the east side river crossing. A second survey, approximately one mile in length, will be conducted in the Boulder Park Area approximately two miles west of Cornehl Lake. One or more observer(s) will search these sections of the 230 foot wide transmission corridor to determine the presence of dead birds

If a dead bird is located during surveys, the following data will be recorded:

- Species
- Sex
- Age (adult or juvenile) if possible
- Physical condition (including broken bones, lacerations, abrasions, blood, discolorations, gunshot wounds, decomposition, feeding damage by scavengers.
- Probable cause of death
- GPS location.

Surveys will be conducted over five days during the spring bird migration and five days during the fall bird migration. Survey days will be spread through each migration seasons.

The observers will also record data for any bird found dead in the Wells 230 Kv transmission line corridor during other phases of the study.

6.2.1.5 Literature Review

A literature review will be conducted to identify potential effects of the 230 Kv transmission lines and towers on raptors and prairie grouse. Refereed journal articles and gray literature will be reviewed. The literature review will be summarized in the study report.

6.2.2 Mammal Surveys

Mammals using the project area will be documented by recording visual observations or sign, including scats, tracks and calls incidental to all field surveys (Call 1986). All observations of RTEs mammals will be recorded, habitat characteristics identified and locations mapped.

6.2.3 Reptile Surveys

The use of the study area by striped whipsnake and other reptiles will be documented by visual encounter surveys (VES). Surveys will be conducted in representative native habitat, within the study area. Surveys will be conducted only during warm weather. The VES method involves searching habitat in a defined area, examining ground vegetation and under large objects (large rocks and woody debris) that may provide cover. All cover objects will be returned to their original position to avoid degradation of habitat. All reptiles will be identified without capturing them, if possible. If necessary, attempts will be made to capture individuals for identification, which will be followed by immediate release. All observations of RTEs reptiles will be recorded, habitat characteristics identified and locations mapped.

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6.3 Documentation

Results of the botanical and wildlife surveys will be documented in a single report. The report will also summarize the methods used for each of the surveys. The results section of the report will include botanical information and wildlife species documented in the Project area. It will also include a matrix of wildlife species by habitat type and results of analyses of species abundance and distribution. Maps of survey locations and the distribution of RTE species will also be part of the report. A draft report will be produced for review prior to preparing the final report.

The report will also include a description of the transmission corridor maintenance program. Potential impacts of the maintenance program to native habitat and RTE wildlife will be identified and summarized in the report.

7.0 STAFFING AND EQUIPMENT REQUIREMENTS

The botanical and wildlife studies will require botanists and biologists with requisite experience to conduct all surveys described above.

The contractors will be responsible to provide a helicopter for the raptor surveys.

The contractors will be responsible for all field data sheets, notebooks, binoculars, flora and other personal field equipment.

The contractors will be responsible for obtaining any permits required for the study.

8.0 BUDGET

The estimate for total person hours required to complete the study is approximately 1756 hours. The botanical portion of the study is estimated at 848 person hours and the wildlife portion of the study at 908 person hours. Estimated hours include pre-field preparation, all field work, data analysis and report writing. The study is estimated to cost $165,000.

9.0 SCHEDULE

Planning for plant surveys will begin shortly after the issuance of FERC's Study Plan Determination in October 2007, with a pre-field research to refine a list of potential RTE plants and invasive species. Applications for permits that may be required for the botanical studies will be sent in during late 2007. Plant collections in the University of Washington herbarium will be studied to develop a sight picture of the RTE plants. Botanical field work is scheduled between May and the end of August 2008 and is dependent on the time RTE species bloom.

Planning for the wildlife surveys will begin in late 2007 with the application for a Scientific Collection Permit from WDFW. The wildlife field studies will begin in May 2008 and continue through the end of October 2008.

An Initial Study Report will be provided to the Terrestrial RWG, stakeholders and FERC in October 2008 with a final report summarizing the study results provided by October 2009.

10.0 REFERENCES

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was raised during a Terrestrial RWG meeting

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of the 230 kV transmission lines, over most of its length, are oriented in a north to south direction. The orientation of the lines is therefore less conducive to waterfowl collision

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cause birds flying east to west or the reverse to be in the most jeopardy of colliding

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with the ground wires, conductors and towers (See Figure 1.1-1). Waterfowl fowl flying to or from the Rocky Reach Reservoir to the wetlands or grain fields on the Waterville Plateau

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more vulnerable to colliding with the lines when compared with the more numerous

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to or from the Wells Reservoir to the plateau on a northern or southern path.

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have little chance of colliding with line due to its orientation

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Concern was also expressed that raptors may also collide with the lines. The most vulnerable raptors are young birds during their first migration in the fall. Fall migrating raptor use the North Cascades flyway, using the lift from thermal and wind caused updrafts ridges in Chelan County (Smith and Neal, 2007). Few raptors migrate through Douglas C

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ounty and the orientation of the 230 kV transmission line presents little hazard.

Portions of the Wells 230 Kv transmission line are adjacent to areas where birds may be attracted including a nearby lake and river crossing. It is unlikely that a bird that has collided with the transmission line ground wire or conductor at the Columbia River crossing below Wells Dam will be recovered if the birds

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fall into the river. Surveys for dead birds will be conducted from the Wells Fish Hatchery on the west side of the 230 Kv transmission line river crossing. The survey will be continued for one half mile on the east side river crossing. A second survey, approximately one

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mile in length, will be conducted in the Boulder Park

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miles west of Cornehl Lake. One or more observer(s) will search

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sections of the 230 foot wide transmission corridor to determine the presence of

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and a white paper written summarizing the literature.